

FOCUS ON EUROPEAN ECONOMIC INTEGRATION

This publication presents economic analyses and outlooks as well as analytical studies on macroeconomic and macrofinancial issues with a regional focus on Central, Eastern and Southeastern Europe.

Publisher and editor

Oesterreichische Nationalbank
Otto-Wagner-Platz 3, 1090 Vienna
PO Box 61, 1011 Vienna, Austria
www.oenb.at
oenb.info@oenb.at
Phone (+43-1) 40420-6666
Fax (+43-1) 40420-046698

Editors in chief

Doris Ritzberger-Grünwald, Helene Schuberth

General coordinator

Peter Backé

Scientific coordinators

Markus Eller, Martin Feldkircher, Julia Wörz

Editing

Claudia Angleitner, Dagmar Dichtl, Jennifer Gredler, Ingrid Haussteiner, Susanne Steinacher

Layout and typesetting

Sylvia Dalcher, Andreas Kulleschitz

Design

Information Management and Services Division

Printing and production

Oesterreichische Nationalbank, 1090 Vienna

DVR 0031577

ISSN 2310-5291 (online)

© Oesterreichische Nationalbank, 2017. All rights reserved.

May be reproduced for noncommercial, educational and scientific purposes provided that the source is acknowledged.

Printed according to the Austrian Ecolabel guideline for printed matter.

Please collect used paper for recycling.

EU Ecolabel: AT/028/024



Contents

Call for entries: Olga Radzyner Award 2017	4
---	---

Call for applications: Visiting Research Program	5
---	---

Studies

The New Silk Road, part I: a stocktaking and economic assessment <i>Stephan Barisitz, Alice Radzyner</i>	8
---	---

Competitiveness of CESEE EU Member States: recent trends and prospects <i>Doris Ritzberger-Grünwald, Josef Schreiner, Julia Wörz</i>	31
---	----

Fintechs and their emergence in banking services in CESEE <i>Caroline Stern</i>	42
--	----

Comparing market power at home and abroad: evidence from Austrian banks and their subsidiaries in CESEE <i>Martin Feldkircher, Michael Sigmund</i>	59
--	----

CESEE-related abstracts from other OeNB publications	78
--	----

*Opinions expressed by the authors of studies do not necessarily reflect
the official viewpoint of the Oesterreichische Nationalbank or of the Eurosystem.*

Call for entries: Olga Radzyner Award 2017

In 2000, the Oesterreichische Nationalbank (OeNB) established an award to commemorate Olga Radzyner, former Head of the OeNB's Foreign Research Division, who pioneered the OeNB's CESEE-related research activities. The award is bestowed on young economists for excellent research on topics of European economic integration and is conferred annually. In 2017, four applicants are eligible to receive a single payment of EUR 3,000 each from an annual total of EUR 12,000.

Submitted papers should cover European economic integration issues and be in English or German. They should not exceed 30 pages and should preferably be in the form of a working paper or scientific article. Authors shall submit their work before their 35th birthday and shall be citizens of any of the following countries: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, FYR Macedonia, Hungary, Kosovo, Latvia, Lithuania, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia or Ukraine. Previous winners of the Olga Radzyner Award, ESCB central bank employees as well as current and former OeNB staff are not eligible. In case of co-authored work, each of the co-authors has to fulfill all the entry criteria.

Authors shall send their submissions by e-mail to eva.gehringer-wasserbauer@oenb.at. Entries for the 2017 award should arrive by September 15, 2017, at the latest. Together with their submissions, applicants shall provide copies of their birth or citizenship certificates and a brief CV.

For detailed information, please visit the OeNB's website at www.oenb.at/en/About-Us/Research-Promotion/Grants/olga-radzyner-award.html or contact Ms. Eva Gehringer-Wasserbauer in the OeNB's Foreign Research Division (write to eva.gehringer-wasserbauer@oenb.at or phone +43-1-40420-5226).

Call for applications: Visiting Research Program

The Oesterreichische Nationalbank (OeNB) invites applications from external researchers (EU or Swiss nationals) for participation in a Visiting Research Program established by the OeNB's Economic Analysis and Research Department. The purpose of this program is to enhance cooperation with members of academic and research institutions (preferably postdoc) who work in the fields of macroeconomics, international economics or financial economics and/or pursue a regional focus on Central, Eastern and Southeastern Europe.

The OeNB offers a stimulating and professional research environment in close proximity to the policymaking process. Visiting researchers are expected to collaborate with the OeNB's research staff on a prespecified topic and to participate actively in the department's internal seminars and other research activities. They will be provided with accommodation on demand and will, as a rule, have access to the department's computer resources. Their research output may be published in one of the department's publication outlets or as an OeNB Working Paper. Research visits should ideally last between three and six months, but timing is flexible.

Applications (in English) should include

- a curriculum vitae,
- a research proposal that motivates and clearly describes the envisaged research project,
- an indication of the period envisaged for the research visit, and
- information on previous scientific work.

Applications for 2018 should be e-mailed to eva.gehringer-wasserbauer@oenb.at by November 1, 2017.

Applicants will be notified of the jury's decision by mid-December. The following round of applications will close on May 1, 2018.

Studies

The New Silk Road, part I: a stocktaking and economic assessment

Stephan Barisitz,
Alice Radzyner¹

China's New Silk Road (NSR) initiative was officially launched in 2013. It aims at enhancing overall connectivity between China and Europe by both building new and modernizing existing – overland as well as maritime – infrastructures. The NSR runs through a number of Eurasian emerging markets with important growth potential. The Chinese authorities have entrusted the Silk Road Fund, the Asian Infrastructure Investment Bank and other institutions with financially supporting NSR activities. Most drivers of the initiative are of an economic or a geopolitical nature. Given the generous financial means at Beijing's disposal and Chinese firms' accumulated expertise in infrastructure projects, many undertakings are currently well under way and promise to (eventually) bring about considerable changes in connectivity, commerce and economic dynamism. While most Chinese NSR investments go to large countries (e.g. Pakistan, Malaysia, Indonesia, Russia, Kazakhstan and Kenya), the strategically situated smaller countries (e.g. Djibouti, Sri Lanka, Kyrgyzstan, Laos, Serbia and Montenegro) typically benefit the most (in relation to the size of their economies). Progress has been made in strengthening the maritime infrastructural trade links with the EU (e.g. through the modernization of deep-water ports) while the upgrading of the currently rather weak trans-Eurasian railroad and highway links (e.g. via Kazakhstan and Russia) is clearly improving overland transportation's yet modest competitive position.

JEL classification: F15, F34, N75, R12, R42

Keywords: New Silk Road, One Belt, One Road, connectivity, trade infrastructure, economic corridors, regional policy, China, Eurasia

Introduction

This study is the first of a set of twin studies on the New Silk Road (NSR).² In part I, we provide a project-oriented overview of China's initiative to establish a New Silk Road linking China and Europe via a number of Eurasian and Asian emerging markets with important growth potential. In part II, we focus on the NSR's implications for Europe, or more precisely, Southeastern Europe (SEE), through which it connects to the heart of the continent. We feel that our brief discussion of concrete projects can provide valuable geoeconomic and geopolitical insights that help us understand the motives, goals and implications of this major endeavor. As far as we know, no other study has yet analyzed the NSR's impact from a project-oriented perspective, i.e. based on essential details of salient NSR projects in various parts of Eurasia and Africa. This contribution is intended to facilitate grasping the overall (potential) connectivity impact of the (strived-for) substantial modernization of trading networks.

Part I is structured as follows: Section 1 describes the most important features of the NSR, which is officially called the “One Belt, One Road” (OBOR) initiative, and the respective Chinese or multilateral financing institutions. Some motivations and reasons, but also risks and limitations, of the Chinese initiative are subject of section 2. Section 3 provides a snapshot of the approximate locations of the “eco-

¹ Oesterreichische Nationalbank, Foreign Research Division, stephan.barisitz@oenb.at, and European Affairs and International Financial Organizations Division, alice.radzyner@oenb.at. The authors are grateful to two anonymous referees as well as to Peter Backé and Julia Wörz (both OeNB) for their helpful comments and valuable suggestions.

² The second study, also authored by Stephan Barisitz and Alice Radzyner, is titled “The New Silk Road, part II: implications for Europe,” and is scheduled for publication in the OeNB's Focus on European Economic Integration Q4/17.

conomic corridors” of the NSR and a succinct discussion of the economic advantages and drawbacks of competing modes of transport, with important implications for OBOR projects. It also analyzes some major OBOR projects. Section 4 finally summarizes and draws some conclusions which help prepare the ground for part II.

1 The New Silk Road's emergence and some related institutions

1.1 Origins and nature of intended cooperation

When China's president Xi Jinping visited Central Asia (Kazakhstan) and Southeast Asia (Indonesia) in September and October 2013, respectively, he launched the initiative of jointly building the Silk Road Economic Belt (SREB, a Eurasian overland trading network linking China and Europe and modeled on its ancient prototype) and the 21st Century Maritime Silk Road (a complementary seaborne trading network). Both networks together make up the New Silk Road (NSR) or the One Belt, One Road (OBOR) initiative,³ which focuses on connectivity and economic cooperation along infrastructural trajectories and comprises the establishment or modernization of port, rail, road, pipeline, energy, communication and IT infrastructure and logistics. The Chinese government described OBOR as the third stage of China's opening up after the development of Special Economic Zones from 1980 and the country's accession to the World Trade Organization (WTO) in 2001.⁴

The SREB focuses on bringing together China, Central Asia, Russia and Europe, on connecting China with the Persian Gulf and the Mediterranean Sea through Central and Western Asia, and on linking China with Southeast Asia, South Asia and the Indian Ocean. The 21st Century Maritime Silk Road is designed to go from China's coast to Europe through the South China Sea and the Indian Ocean, connecting China with Southeast Asia, South Asia, East Africa and the Mediterranean (see State Council – The People's Republic of China, 2015, p. 2). OBOR is sometimes compared to the Marshall Plan, a very successful U.S. initiative worth approximately USD 130 billion (in 2015 terms) that was aimed at promoting the economic reconstruction and integration of Western European economies after World War II (Djankov and Miner, 2016, p. 6). However, Chinese aspirations appear far more extensive, if more vague: The authorities in Beijing assess that OBOR potentially involves 65 countries in Asia, Africa, the Middle East and Europe and 4.4 billion people or about 60% of the world's population (Grieger, 2016, p. 4). Enhancing connectivity in an area that generates an estimated 50% of global GDP and boasts about three-quarters of known energy reserves may have a significant economic impact.⁵ Estimates identify infrastructure construction needs exceeding USD 800 billion (Ettinger, 2016, p. 33).

The OBOR (or NSR) initiative is to be implemented through promoting inter-governmental cooperation and policy coordination (unlike the Marshall Plan, this initiative has made no demands for explicit trade policy liberalization steps of participating countries). Within this framework, the Chinese authorities have set

³ OBOR was later also called Belt and Road Initiative (BRI). In the following, we will use NSR and OBOR as synonyms.

⁴ Actually, another New Silk Road initiative was launched two years before OBOR in 2011: the U.S. New Silk Road Initiative (NSRI). However, this is a comparatively modest endeavor both financially and regionally, featuring an important diplomatic component. For more details on the NSRI, see section 3.3.

⁵ This may invite comparison to early globalization in the Mongol era: The territory of the Mongol Empire (including all its subempires) at its apex (around 1280 CE) is estimated to have covered (almost) the entire Silk Road network of the time, or a quarter of the world's land surface and almost half of its population (Barisitz, 2017).

up or contributed to setting up specialized institutions to support and finance NSR projects (see subsection 1.2). Chinese enterprises are encouraged to participate in infrastructure construction in other countries along the OBOR and make industrial investments there. The Chinese authorities, at least in theory, also support “localized operation and management of Chinese companies to boost the local economy, increase local employment, improve local livelihoods” (State Council, 2015, p. 5). Yet in fact, given that China typically covers most of the financing, management is often in Chinese hands and the bulk of construction work is frequently carried out by Chinese firms and their workers, sourcing Chinese equipment, which is not always appreciated by local project partners (see also section 2).

1.2 Selected institutions supporting the New Silk Road

A number of institutions, mostly Chinese, but partly also multinational, are entitled to finance OBOR projects:

- The *Silk Road Fund (SRF)*: In December 2014, China’s government established this development and investment fund domiciled in Beijing. The Chinese authorities injected USD 40 billion of capital, which was provided by the State Administration of Foreign Exchange, the Chinese Investment Corporation, the Export-Import Bank of China (China EXIM Bank) and the China Development Bank.⁶ The SRF took up operations in spring 2015 and is being used to acquire equity stakes in infrastructure, resource development and industrial cooperation ventures in countries along the NSR. By March 2017, it had invested more than USD 6 billion in OBOR projects.
- The *Asian Infrastructure Investment Bank (AIIB)*: This institution, based in Beijing, started to operate in January 2016. By March 2017, the multilateral outfit had 52 members and 18 prospective members, including many countries along the OBOR, among them a number of European countries. China is the single largest shareholder, accounting for 26.1% of voting rights, followed by India (7.5%), Russia (5.9%) and Germany (4.2%). The AIIB’s authorized capital is USD 100 billion. The AIIB has challenged the regional if not global governance paradigm by claiming its own ground alongside the Japan-dominated Asian Development Bank (ADB) and the World Bank (WB), in which the United States holds pre-eminence (Grieger, 2016, p. 6).⁷ In early 2016, the first projects were initiated and received loans (albeit in partnership with other institutions, including the WB). By March 2017, 12 projects had received AIIB financial support totaling USD 2.6 billion. The institution apparently plans to contribute around USD 12 billion to the NSR initiative (Djankov and Miner, 2016, p. 9).
- The *New Development Bank (NDB)*: This multilateral lending institution was established in 2014 by the BRICS countries (Brazil, Russia, India, China and South Africa) and equipped with USD 100 billion. NDB headquarters are in Shanghai. Business started in 2016; at end-2016, projects in all member countries had been approved, involving financial assistance of about USD 2 billion. Around USD 10 billion of NDB money may be earmarked for NSR projects.

⁶ In addition, at an international New Silk Road summit in Beijing in May 2017 President Xi Jinping announced China’s willingness to inject an additional USD 15 billion into the SRF.

⁷ Prior to the establishment of the AIIB, the WB had reportedly estimated that Asian demand for infrastructure would amount to some USD 730 billion per year up to 2020, yet the WB and the ADB together have been able to supply only a fraction of that sum. Japan and the United States have (so far) not joined the AIIB.

The Chinese authorities have reportedly allocated the following amounts for use in OBOR projects to the country's "policy banks" (Djankov and Miner, 2016, p. 9):

- Export-Import Bank of China (China EXIM Bank): USD 30 billion
- China Development Bank (CDB): USD 32 billion
- Agricultural Development Bank of China (ADBC): USD 20 billion

2 The New Silk Road: some motivations and reasons, challenges and risks

China's OBOR initiative has been motivated and driven by a number of quite heterogeneous aims, which primarily include economic, but also geopolitical and even ecological issues:

- *Improvement of transportation links, reduction of trade costs to Europe and other parts of Eurasia*

The basic idea of the OBOR initiative is to better link up the "vibrant East Asian economic circle at one end and the developed European economic circle at the other" (State Council, 2015, p. 2), following the example of the NSR's predecessor, the traditional Silk Road, which lasted for about two millennia, witnessed many ups and downs, and linked the same two major traditional hubs of economic activity: the Middle Kingdom and Europe, or the Orient and the Occident (Barisitz, 2017). As, once again today, the world's biggest trading nation, modern China's interest is to reduce the costs of transporting goods (by land and sea) to other destinations. More efficient and secure and, if possible, shorter trade routes to Europe can further this goal.⁸

The fact that about three-quarters of Chinese imports from Russia and 60% of Chinese imports from Kazakhstan are reportedly carried out via the ports of St. Petersburg and Vladivostok, although both Russia and Kazakhstan are immediate neighbors of China and share more than 2000 km of common borders with China, points to the relatively modest level of logistical development of intra-Eurasian overland trade. This may indicate vast connective potential for infrastructural projects in this area.

- *Redirection of Chinese surplus savings, reutilization of domestic productive capacities and technical expertise for NSR investments*

The NSR initiative can serve as a means of countering the recent marked downturn or weakened growth of the Chinese economy. The country probably has more savings than it can profitably invest at home. After many domestic infrastructure projects have been finished, Chinese infrastructure-related industrial and service sectors are saddled with overcapacities. OBOR's economic dimension includes generating substantial foreign demand for reutilizing these domestic resources. This also relates to Chinese high-speed rail expertise: Chinese enterprises have gained great experience in high-speed rail construction within the country and are looking to apply their expertise in projects abroad now (Urban, 2016, p. 13). While such aims are quite understandable, they would also appear to constitute an extension or resuscitation of China's traditional economic model of export-led growth or at least a slowdown or interruption of its intended transition to domestic consumption-led economic expansion.

⁸ *The EU is China's largest market abroad.*

- *Diversification of investments, markets and suppliers*

One particular aim of the OBOR initiative is to hedge substantial existing Chinese placements in U.S. financial assets by investing in Eurasia. The NSR also promises to help diversify markets and suppliers through stimulating trade with landlocked or (so far) more difficult-to-access neighbors not yet trading that much with China. Infrastructure development in countries along the OBOR routes may raise growth in their economies and thus contribute to increasing demand for China's goods and services (Djankov and Miner, 2016, p. 7).

- *Creation of "strategic propellers of hinterland development"*

This OBOR objective with respect to China's less-developed central and western provinces has been put forward by Premier Li Keqiang (see State Council, 2015, p. 1). While Chinese growth has in recent decades favored the country's eastern and coastal provinces, the NSR is to transform the northwestern province of Xinjiang into China's infrastructural gateway to Central and Western Asia, which will open up opportunities for investment and stepped-up economic activity in this remote, politically somewhat restive, province. Correspondingly, in the southwest, the province of Yunnan should become the modernized "open door" to South Asia and the Indian Ocean. Thus, the authorities hope to tackle the socioeconomic divide (gross income inequalities) between economically peripheral inland and "connected" coastal provinces. Since all OBOR corridors depart from central or western provinces, the intended geoeconomic rebalancing could mitigate these disparities (Grieger, 2016, p. 9).

- *Contribution to the internationalization of the Chinese renminbi-yuan*

Alongside the development of closer trade and investment relations and deeper financial integration among OBOR countries, the Chinese authorities will promote the use of the renminbi-yuan in international transactions.⁹ The aim is i.a. to expand the scope and scale of bilateral currency swaps and settlements with other countries along the NSR. Efforts of governments of partner countries and their companies and financial institutions with good credit ratings to issue renminbi-yuan-denominated bonds in China will be encouraged (State Council, 2015, p. 5).

- *Hedge in case of possible trade war*

Since U.S. President Trump withdrew the U.S.A. from the Transpacific Partnership (TPP) in late January 2017, the TPP has lost much of its importance. Prospects for the conclusion of the Transatlantic Trade and Investment Partnership (TTIP) have also diminished considerably. Thus, the OBOR appears to be less under pressure than in the past to counterbalance potential rival trade initiatives. However, if a trade war between China and the U.S.A. were to break out, Beijing may expect enhanced connectivity and cooperation with NSR countries, notably with European partners, to soften the impact somewhat.

- *Pragmatic infrastructural project cooperation as a possible way forward where trade integration areas have lost popularity*

Pragmatic cooperation between one or more states and enterprises focusing on a particular infrastructural project (like a pipeline, a rail or highway link, a hydro-

⁹ Meanwhile, in another measure favoring the Chinese currency's global standing, the IMF included the renminbi-yuan in its basket of Special Drawing Rights (SDR) at end-September 2016. The OeNB had already purchased renminbi-yuan in 2011, and was one of the first central banks worldwide to have done so. In mid-June 2017, the ECB included renminbi-yuan reserves worth EUR 500 million in its foreign exchange reserves by reducing its U.S. dollar reserves by an equivalent amount.

power dam or electricity grid, a deep-sea port, etc.) provides task-oriented experience and may improve connectivity and intergovernmental relations. In a time of growing skepticism about trade and economic integration treaties such concrete, if limited, advances may promise greater success than traditional “deepening” efforts. At the same time, physical and nonphysical trade facilitation measures (the latter include the harmonization of customs, import, export and border crossing procedures) can arguably only be seen as complementary measures and not as alternatives.

- *Venue for addressing strategic energy and resource security issues*

Approximately 75% of China’s oil imports and an even higher share of its total imports are seaborne and pass through the Strait of Malacca between the Indian Ocean and the South China Sea (Escobar, 2015, p. 7; Grieger, 2016, p. 8). This geopolitical bottleneck could be closed by a military adversary in the case of conflict, which makes China potentially strategically vulnerable. China’s energy security is also put at risk by piracy that is rife in and near the area. China’s dependence on shipments through the Strait of Malacca has already been partly reduced by the creation of alternate (overland) trade channels, including the construction of pipelines from Central Asia¹⁰ and of corridors linking China directly to the Indian Ocean (via Pakistan and via Myanmar, see subsections 3.1 and 3.2).

- *Ecological goal: reduction of China’s heavy reliance on polluting coal*

China’s reliance on coal for about 40% of its heating and electricity has substantially contributed to pollution in its cities. The authorities have set ambitious goals for dealing with the pollution problem, including switching from coal to cleaner – but so far mostly imported – energy sources, e.g. natural gas from Central Asia and Russia (Havlik, 2015).

Needless to say, the OBOR initiative also faces a number of challenges and risks:

- *Weak local governance, sprawling bureaucracy and potential political instability*

OBOR partner countries feature quite diverse political and economic conditions, with inherent risks ranging from possible legal and financial challenges to political or social instability and regional disparities. Given that many partner countries are not members of a political or economic integration area, border constraints (including possibly cumbersome clearance procedures and long waiting periods) may have to be coped with. The implementation of large infrastructure projects in the absence of well-performing and accountable government procurement systems may even add to local corruption and/or governance challenges.

- *Frequent Chinese dominance in projects and possibly limited regard for local conditions may give rise to concern*

While the preeminent position that Chinese project partners often assume in OBOR projects as regards finance, management and the deployment of Chinese firms and their workers may help speeding up a project, it may not favor broad positive spillover effects for local economies. In some cases, there may be the risk that insensitive behavior of investors (e.g. as regards labor, health and safety standards, quality of inputs used, respect for traditional local communities and the environment) gives rise to irritation and even protests on the part of the local population.

¹⁰ Already about half of China’s natural gas imports arrive overland from Central Asia, which shows that the strategy to cut the country’s dependence on seaborne imports predates the launching of the NSR (Clover and Hornby, 2015).

- *Possible fallout from heightened geopolitical tensions or rivalry*

A totally different risk is the possible negative (political) fallout from military tensions, e.g. in the South China Sea, which cannot be entirely discarded, either. Another risk is that projects may fall victim to a flare-up of geopolitical competition with other powers (Giret and Giret, 2016; see also subsection 3.3).

3 Constituent economic corridors and some big projects

3.1 Economic corridors

China is aiming at jointly building so-called economic corridors with partner countries, taking advantage of existing international transportation routes, while also providing for new trajectories, linking major cities. In this context, the refurbishment or construction of roads, railroad lines, oil and gas pipelines, optic fiber networks as well as intermodal transport hubs may be of key importance.

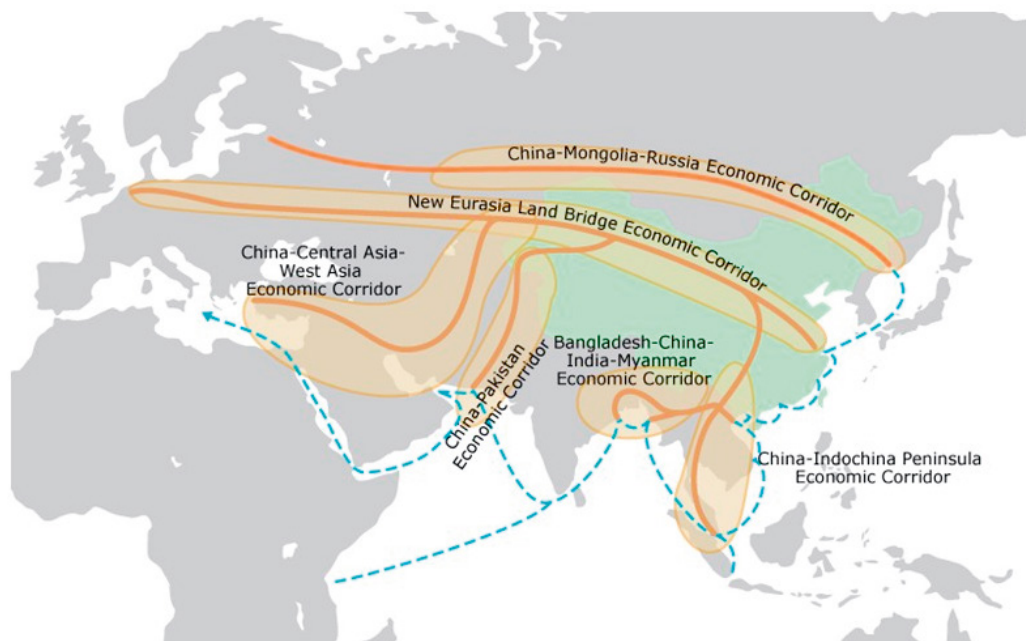
The economic corridors mentioned above can be grouped into those of the *Silk Road Economic Belt* (SREB, predominantly overland) and those of the *21st Century Maritime Silk Road* (MSR, predominantly seaborne).

The SREB envisages the following economic corridors (see also map 1):

- *New Eurasian Land Bridge Economic Corridor* (Xinjiang-Kazakhstan-Russia): This corridor comprises (at least) two routes through Kazakhstan: either via Almaty or via Astana. Routes reunite in Moscow and continue via Belarus to the EU (Duisburg, Germany, or Rotterdam, Netherlands).

Map 1

The Belt and Road Initiative: six economic corridors spanning Asia, Europe and Africa



Source: China Trade Research (Hong Kong Trade Development Council – HKTDC).

- *China-Mongolia-Russia Economic Corridor*: This corridor also comprises at least two routes: either Beijing-Ulan Bator-Siberia or Dalian¹¹-Harbin-Siberia. This corridor also fits with Mongolia's planned Steppe Road trajectory.
- *China-Central Asia-West Asia Economic Corridor*: This route is envisioned as an important gateway for oil and natural gas, running from the Arabian peninsula, Turkey and Iran to Xinjiang.
- *China-Pakistan Economic Corridor*: This trajectory i.a. enables shipping oil from the Middle East (via the Persian Gulf and the Arabian Sea) to the deep-sea port of Gwadar in Pakistan (officially leased to China in 2015) and then carrying it by road, railroad or pipelines via Rawalpindi to Kashgar (province of Xinjiang).
- *Bangladesh-China-India-Myanmar Economic Corridor*: This route is supposed to connect China with South Asia, running from Kunming (capital of Yunnan, China), Mandalay (Myanmar), Dhaka (the capital of Bangladesh) to Kolkata (capital of West Bengal, India).
- *China-Indochina Peninsula Economic Corridor*: The central trajectory of this route links southern China with Bangkok and Singapore; new high-speed railroads and highways are planned to run from the Pearl River Delta (around Hong Kong and Guangzhou¹²) to Singapore via Bangkok (Thailand) and Kuala Lumpur (Malaysia).
- *India-Nepal-China Economic Corridor*¹³: As a centerpiece of this passage, a new railroad line has been proposed which should link Tibet (Lhasa), Nepal and India, and could boost regional and trilateral trade.

The MSR envisages the following connections (map 1):

- *China-Myanmar-Indian Ocean-Middle East*: This route (described in the reverse direction) runs from the Persian Gulf via the Indian Ocean to the deep-sea port of Kyaukpyu¹⁴ in the Bay of Bengal (Myanmar); from there, oil and gas pipelines cross Myanmar to Kunming.
- *China-South China Sea-Indian Ocean-Middle East or China-South China Sea-Indian Ocean-Red Sea-Europe*: Both maritime routes (which bifurcate in the Indian Ocean) are traditional links running via the Strait of Malacca. The second route (via the Red Sea to Europe) has gained prominence recently due to substantial Chinese infrastructural investment activities at the route's European head (Greek port of Piraeus, high-speed rail connection to Budapest, etc.) and due to stepped-up combatting of piracy near the Horn of Africa. Antipiracy patrols are supported by the recently established Chinese military base in Djibouti, China's first overseas base in at least two centuries.
- *China-South China Sea-Indian Ocean-East Africa*: This is, to a large degree, a resource supply route, starting with railroad links from the African interior to the coast (Mombasa, Kenya), followed by seaborne connections via the Strait of Malacca to China.

¹¹ Former Port Arthur.

¹² Traditionally romanized as Canton.

¹³ This regional initiative – not shown in map 1 – was added to OBOR after the April 2015 earthquake in Nepal.

¹⁴ This port was built by a Chinese corporation.

3.2 Maritime connectivity still outdoes overland connectivity, which however is gaining some ground

Over long distances, like across Eurasia, overland rail transportation tends to be somewhat less expensive than road transportation. Sending a container (of a standard length of 20 feet or about six meters) on rail from China to Europe costs about USD 6,000 to 10,000; however, transporting a container by ship comes to only USD 1,000, while air freight from one end of Eurasia to the other is four to five times higher than rail carriage. Accordingly, about 95% of EU trade with China and 80% of China's total exports are carried out on the maritime route.¹⁵ On the route between Asia and Europe, only around 50,000 containers (less than 1% of the total number) reportedly transited through Central Asia in 2015, while almost 15 million containers were shipped by sea that year (Thorez, 2016, p. 39; Nemitz, 2017). This is also attributable to the still rudimentary state of some of the overland transportation links in Eurasia. Nevertheless, trans-Eurasian rail links have been upgraded in recent years, and the number of containers running through Central Asia more than doubled to around 105,000 in 2016 and is expected to more than double again to 230,000 in 2017 (about 1.5% of the total number of containers shipped between China and Europe). Since 2011, a train, the Trans-Eurasia-Express (see subsection 3.3), regularly conveys valuable merchandise, e.g. computers, other electronic equipment and garments from Chongqing (central China) to Duisburg. On their way back to China, these trains carry European car parts, wine, whiskey, chocolate, pharmaceuticals and other precious goods. Since February 2016, China and Iran have also been linked (via Kazakhstan and Turkmenistan) by freight trains. Railroads connecting China to Europe can reduce the number of days of shipment to an average of 12–15, compared to 30–35 days required by maritime transport.

For long-range transportation overland to be profitable, specialization on particular types of goods is needed (goods of high added value, like high-tech components or high-end fashion products, or time-sensitive or perishable luxury goods, like certain flowers, liquors or cheese).¹⁶ Progress seems to have been made in bringing down costs of overland rail conveyance in recent years to about twice the comparable cost of maritime transportation (Kalinina, 2017). Central Asian political and economic elites, particularly in Kazakhstan, hope that the modernization of infrastructure will contribute to further sharply increasing the small share of overland transport in total trade flows between Asia and Europe in the coming years.

Despite expected further improvements and upgrading of land routes, drawbacks remain in comparison to sea lanes: While the transcontinental trajectories, dominated by rail links, are faster, they feature (much) smaller transportation capacity than seaborne alternatives due to technical and physical constraints (including available rail shipping capacity of up to 300 containers per train versus a seaborne shipping capacity of up to 10,000 containers per cargo ship). The overland corridors

¹⁵ For comparing some key China-Europe maritime and rail connections, see map 2.

¹⁶ This is, of course, a basic commercial principle and similar requirements were valid throughout the history of the traditional Silk Road for almost two millennia (see Barisitz, 2017).

also suffer from partly cumbersome border control regimes¹⁷ and from the need for trains to change between different rail gauges at certain borders (e.g. between China and Kazakhstan or between Belarus and Poland or between China and Myanmar or Vietnam and China), which slows down movement. Finally, even if rail carriage costs have declined in recent years (as mentioned above), they continue to be substantially undercut by the cheapness of maritime container transportation (Thorez, 2016, p. 41). This suggests that long distance (Eurasian) bulk trade should remain dominated by maritime (MSR) shipping, while a niche of high value-added or time-sensitive luxury goods should become profitable merchandise for modernized transcontinental (SREB) rail transportation (see also Shepard, 2016). Furthermore, (updated) overland links (SREB) will continue to prevail in trade with landlocked neighbors or trade of a regional character (where there is no or almost no maritime competition).

3.3 Overview of some major OBOR projects in progress

The following is a non-exhaustive survey of some of the more important projects that are being realized under the OBOR initiative and that are (at least to an extent of 10%) being financed by Chinese sources. Where exceptions are made from this principle (i.e. where Chinese financial contributions are not part of Silk Road ventures), this is explained. As can be expected, the discussed projects mostly comprise infrastructure schemes along NSR corridors, including the new construction or renovation of (high-speed) railroads, highways, ports, airports, pipelines, the spreading of IT infrastructure networks, etc. Energy projects, as far as they contribute to increasing energy supplies to China or to OBOR countries, are also included. Table 1 provides a succinct list of some key projects, map 2 gives a spatial overview thereof.¹⁸

Before China proclaimed its OBOR initiative in 2013, the U.S. vision of a New Silk Road Initiative (NSRI), launched in 2011, was designed as a post-conflict agenda for Afghanistan after the planned American military withdrawal from that country and concentrated on boosting energy and transport connectivity between Central Asia and South Asia (mostly India and Pakistan). These efforts have been epitomized by the Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline, also called Trans-Afghanistan Pipeline, and by the Central Asia-South Asia Electricity Transmission and Trade Project, or CASA-1000, for hydropower electricity exports from Kyrgyzstan and Tajikistan to the south. TAPI's construction started in 2015, its total cost has recently been estimated at about USD 10 billion, and its financing is being supported by the Asian Development Bank (ADB). The CASA-1000 is a USD 1.2 billion project, its groundbreaking took place in 2016 and financial assistance has been forthcoming from the WB. However, the above projects have been repeatedly delayed or obstructed by insufficient coordination between national authorities,

¹⁷ According to the conference "Laying the foundation in the UNECE region for economic integration and sustainable development towards 2030" in Minsk in October 2016, cumbersome border controls frequently constitute the major obstacle to connectivity in Central Asia. Trucks, for instance, may spend more time waiting at borders than in motion in this region.

¹⁸ Most OBOR projects are not carried out in Europe, as will be clear from the information provided below. As Julia Grübler (wiiw) pointed out in a panel discussion at the conference "Chinas wirtschaftspolitische Initiative 'Neue Seidenstraße' – Bedeutung und Folgen für die Europäische Union" (Haus der Europäischen Union, Vienna, April 20, 2017), online research shows a very eurocentric view of these developments, while in reality China invests in 60 OBOR countries outside the EU.

Table 1

Some key One Belt, One Road projects and their financial support

Project	Host country of investment	Construction period (planned)	Total project costs or amount of Chinese investment or financial support (USD billion)	Investment costs or financial support as a ratio to host country's or countries' GDP (%) ¹
Khorgos Gateway (Special Economic Zone)	China, Kazakhstan	2014–2017	6.5 (total)	0.01 (PRC), 0.34 (KAZ)
Western Europe–Western China Expressway (Kazakh part)	Kazakhstan	2009–2020	3.0 (SRF ²)	0.14
Gas pipeline Beyneu–Shymkent	Kazakhstan	2013–2017	1.8 (CDB ³)	0.20
KAZ total: 0.68				
High-speed rail link Moscow–Kazan	Russia	2017–2023	15.0 (total)	0.16
Yamal Liquefied Natural Gas (LNG) project	Russia	2015–2023	12.0 (China EXIM Bank, CDB)	0.10
Sberbank and Vneshtorgbank (VTB) infrastructure investments	Russia	from 2015	1.45 (China)	0.04
Power of Siberia (Sila Sibiri) gas pipeline	Russia	2015–2019	2.0 (People's Bank of China)	0.06
RUS total: 0.36				
Deep-sea port of Gwadar	Pakistan	2016–2017	1.6 (total)	0.39
Karot Hydropower Dam	Pakistan	2016–2020	2.0 (total, SRF)	0.15
Karakorum Highway reconstruction	Pakistan, China	2012–2018	2.5 (China EXIM Bank ⁴ , CDB)	0.07 (PAK), 0.01 (PRC)
Karachi–Lahore Expressway	Pakistan	2016–2022	6.6 (total)	0.35 (PAK)
Karachi–Peshawar Railway Line upgrade	Pakistan	2013–2018	5.5 (China)	0.34
PAK total: 1.30				
Oil and gas pipelines Kyaukpyu–Kunming	Myanmar, China	2009–2013/14	2.5 (total)	0.58 (MMR), 0.01 (PRC)
Power system upgrade and expansion Bangladesh	Bangladesh	2016–2019	0.17 (AIIB)	0.02
Colombo Port City and Sri Lanka infrastructure development	Sri Lanka	from 2014	5.0 (total, of which 1.4 billion for Colombo port city)	1.52
Kenya (Mombasa–Nairobi) high-capacity railroad	Kenya	2014–2017	3.8 (of which 90% China EXIM Bank)	1.5
Djibouti and Ethiopia infrastructure development	Djibouti, Ethiopia	from 2010	12.0 (China, of which 2.4 billion for railroad line to Addis Ababa)	70.3 (DJI), 0.8 (ETH)
Large container terminal Ashdod Port	Israel	2015–2021	0.93 (total)	0.04
Port of Piraeus (purchase and modernization)	Greece	from 2016	0.81 (Cosco ⁵)	0.14

Memorandum items: some non-Chinese supported connectivity projects in Asia

Turkmenistan–Afghanistan–Pakistan–India (TAPI) gas pipeline (supported by the U.S.A.)	Turkmenistan, Afghanistan, Pakistan, India	from 2015	8.0 (ADB ⁶ and others)	0.54 (TKM), 1.04 (AFG), 0.08 (PAK), 0.01 (IND)
Central Asia–South Asia power project (CASA-1000) (supported by the U.S.A.)	Kyrgyz Republic, Tajikistan, Afghanistan, Pakistan	from 2016	1.2 (total)	3.03 (KGZ), 2.53 (TJK), 1.04 (AFG total: 2.08), 0.07 (PAK total: 0.15)
Chabahar Port modernization (supported by India)	Iran	2016–2017	0.15 (Exim Bank of India)	0.02
Chabahar–Zahedan railway project (supported by India)	Iran	2016–2020	1.6 (total)	0.08 (IRN total: 0.10)
Deep-sea port Matarbari (supported by Japan)	Bangladesh	from 2016	4.8 (total)	0.62

Source: Various international press articles, www.silkroadfund.com.cn/enweb/23809/23812/index.html, www.aiib.org/en/projects/approved/index.html.

¹ The respective countries' 2015 GDP is taken as denominator. Investment sums of projects lasting more than one year are divided by the (planned) number of years and related to 2015 GDP.

² Silk Road Fund.

³ China Development Bank.

⁴ Export-Import Bank of China.

⁵ China Ocean Shipping Company.

⁶ Asia Development Bank.

which are worth around USD 290 billion (see Djankov and Miner, 2016, p. 6; Wildau and Nan, 2017).

3.3.1 Kazakhstan and Russia

Kazakhstan plays a geographically and economically central role with respect to Chinese SREB schemes. One of the most prominent projects is the Khorgos Gateway or Khorgos Special Economic Zone (SEZ), not far from Almaty, at the border with China (Ili district, Xinjiang), which is to become a major logistical center linking East Asia and Europe. The project has advanced considerably, but is not yet entirely completed. Beijing and Astana are developing this dry port (an emerging transshipment hub for trains and trucks) together. The area of the SEZ surrounding the border town of Khorgos is 528 hectares, of which 35% belongs to Kazakhstan and 65% to China. Total investment in the cargo hub has exceeded USD 3 billion since 2014 and is projected to be doubled; trade operations have begun in August 2015. The Kazakh and Chinese authorities aimed at multiplying the number of transshipped containers to more than 40,000 in 2016 and have reportedly overfulfilled this goal. The Khorgos Gateway has contributed to establishing the second China-Europe rail link via Almaty and Kazakhstan. It complements the existing China-Europe railroad, the Trans-Eurasia-Express (11,179 km), which was completed in 2014 (see above) and follows this route: Chongqing (Central China) – Urumqi (capital of Xinjiang) – Dzungarian Gate (at the border with Kazakhstan) – Astana – Yekaterinburg – Moscow – Warsaw – Duisburg (for the location of these two China-Europe rail links, see map 2). The latter line is primarily used by China to ship USD 3 billion worth of goods to Europe annually; Russia has also started to use it and shipped about USD 260 million worth of goods to China in 2014 (Djankov and Miner, 2016, p. 34).²⁰

Another infrastructure project with OBOR financing crossing Kazakhstan is the Western Europe-Western China Expressway, which has been designed as the shortest highway link between China and Europe (8,445 km) and partly runs parallel to the Trans-Eurasia-Express as well as to the second China-Europe rail link along the following route: Lianyungang (at the East China Sea coast) – Xian (capital of Shaanxi province, Northwest China) – Urumqi – Khorgos – Almaty – Shymkent (Kazakhstan) – Kyzylorda (Kazakhstan) – Aktobe (Kazakhstan) – Moscow – St. Petersburg (see map 2). The WB, EBRD, ADB, and Islamic Development Bank are together providing USD 4 billion in funding for the highway, and the SRF has offered another USD 3 billion toward its completion. While long-haul road transport is more costly than rail conveyance, trucks can be more easily used by local businesses.

New projects that deliver oil and gas to China have also received support from the NSR initiative. Thus, Kazakhstan has received a USD 1.8 billion loan from the China Development Bank to construct a 1,280 km gas pipeline from Beyneu in the Caspian Lowlands to Shymkent, from where the newly constructed pipeline will connect with the existing Central Asia-China gas pipeline. A more general framework agreement provides for the establishment of a China-Kazakhstan Production Capacity Cooperation Fund, in which the SRF has promised to invest USD 2 billion to support projects in relevant areas.

²⁰ *One-way traffic is a challenge the Trans-Eurasia Express still needs to fully surmount: Apparently, five trains full of cargo leave Chongqing for Duisburg every week, but only one full train returns weekly (Wuttke, 2017).*

Russia has become a key geopolitical partner for China in recent years, as both countries have been experiencing increasing tensions with the West. Russia joined several OBOR projects and is a founding member of the AIIB. The authorities in Moscow partly use the NSR to circumvent Western sanctions in connection with the Ukrainian crisis and to gain access to alternate investment sources and credit lines. As a result of the conflict with the EU, Russia strives to diversify its trade in a “pivot” to China. While China’s share in Russia’s foreign trade turnover increased a bit in recent years, a breakthrough in this direction has not been achieved. In May 2015, President Xi Jinping signed a series of infrastructure agreements worth USD 25 billion with Russia, Kazakhstan and Belarus on high-speed rail, energy infrastructure and aerospace as well as industrial parks. In the same year, an agreement was reached with Russia to increasingly base trade relations and joint investment projects on local currencies (both the Russian ruble and the renminbi-yuan) (China-Britain Business Council, Foreign & Commonwealth Office, 2016, p. 11; Djankov and Miner, 2016, p. 34).

As Gabuev (2016a) points out, Western sanctions probably accelerated Moscow’s rapprochement with China. Three key barriers were removed: First, Moscow decided it had been too reserved about selling advanced weaponry to Beijing. Second, Moscow chose to review a de facto ban on Chinese participation in large infrastructure and natural resource projects (in other words: informal barriers to Chinese investment in sensitive sectors, which arguably correspond to OBOR-type projects, were eased). Third, the Russian leadership reassessed its relationship with China in Central Asia, which had hitherto been defined as largely competitive with very limited opportunities for collaboration (Gabuev, 2016a, p. 2).

In October 2014, Russia and China signed a memorandum of understanding over the construction of a high-speed rail link between Moscow and Beijing. The total costs have been estimated at about USD 240 billion. The journey time over the envisaged trajectory of about 7,700 km, running from Moscow via Kazan (capital of the Republic of Tatarstan), Yekaterinburg and probably through Kazakhstan (Astana), should be cut from five days to about 33 hours. The first section (770 km) from Moscow to Kazan is planned to be built until 2023. Beijing has committed a USD 6.5 billion loan, while German (including Siemens and Deutsche Bahn) and Chinese investors have promised capital injections of USD 2.8 billion and USD 1.6 billion, respectively (Shepard, 2017). The total cost for the section is gauged at about USD 15.0 billion. A USD 390 million contract for designing the rail line was awarded to China Railway Group in 2015, construction is to begin in 2017. In mid-2016, a Russian-Chinese consortium reportedly also signed an agreement to erect a plant in Russia to assemble high-speed trains (Farchy et al., 2016).

In September 2015, the SRF bought a 10% stake (of USD 1.1 billion) in the Yamal Liquefied Natural Gas (LNG) project²¹ of Russia’s second biggest gas producer, Novatek. In April 2016, the China Development Bank and the Export-Import Bank of China announced that they had agreed to provide much needed loans of USD 12 billion over 15 years for this flagship LNG project, whose total expected investment volume is USD 27 billion. This is the financially most important OBOR transaction in Russia so far and has been carried out regardless of the fact that

²¹ Located on the Yamal peninsula (West Siberian Arctic).

Novatek (and its major shareholder Gennady Timchenko) is a target of U.S. and EU sanctions (Gabuev, 2016a, p. 11; Gabuev, 2016b, p. 2).

The SRF has also invested in Sibur, Russia's largest associated petroleum gas processing company, located in Tobolsk (West Siberia), and in Rusnano, the state's nanotechnology corporation. Other OBOR transactions include a USD 970 million credit line to Sberbank to support finance for road projects and logistics infrastructure and a USD 480 million credit line to Vneshtorgbank (VTB) for modernization investments in farming and transportation (Djankov and Miner, 2016, p. 8, p. 35). Other deals are minor in monetary terms but larger in their symbolic significance, such as the Jiangsu Hengtong Power Cable Company's agreement to supply high-voltage cable (worth USD 95 million) for the energy bridge that is to supply electricity to Crimea to replace suspended deliveries from Ukraine (Gabuev, 2016a, p. 14)²².

3.3.2 South and Southeast Asia

Pakistan has a long-standing close relationship with China: A number of OBOR projects have been launched within the framework of the China-Pakistan Economic Corridor (CPEC), which calls for a total investment of USD 46 billion (Clover and Hornby, 2015). As mentioned above, CPEC projects are to provide China with an alternate strategic route for energy supplies; they should also strengthen the Pakistani economy by rapidly putting in place or overhauling infrastructure, particularly power generation capacities. Flagship projects include the further development of the deep-sea port of Gwadar (leased by China, construction works were carried out in 2016–2017 at a cost of USD 1.6 billion),²³ the building of the Karot Hydropower Dam (in the Himalayas, to be carried out by a subsidiary of the China Three Gorges Corporation from 2016, at a cost of USD 2.0 billion, funded by the SRF), the reconstruction and overhaul of the Karakorum Highway (between Rawalpindi and the Xinjiang border, at an estimated cost of USD 2.5 billion, funded by concessional loans from the Export-Import Bank of China and the China Development Bank)²⁴, the construction of a 1,100 km long expressway between Karachi and Lahore, and the upgrading of the Karachi-Peshawar main railroad line.²⁵

²² Western firms are barred from participating due to sanctions.

²³ Gwadar is a crucial link between the SREB and the MSR components of the OBOR. There have been complaints from the regional ethnic Baloch population against being economically marginalized by the influx of Chinese engineers and laborers, and of nonindigenous Pakistanis, particularly Punjabis; the Islamabad authorities have reacted by stepping up security presence in the area. Although definite decisions have not yet been made, plans have emerged to build an oil pipeline (for oil brought by tankers from the Middle East) from Gwadar along the CPEC to Kashgar. The project would require about USD 5 billion and construction would start in 2017. About one-fifth of China's oil consumption could travel this route, circumventing the Strait of Malacca (Yousafzai, 2016). However, there do not appear to be any reliable Chinese financing assurances for the pipeline yet.

²⁴ Passage of the Karakorum Highway is not possible all year round. This transport link is also endangered by recurrent avalanches and floodings. Modernization and stepped up tunneling will, however, cut exposure to the elements.

²⁵ To briefly refer to a contrasting, if more modest, geopolitical and economic initiative: In May 2016, India and Iran signed a bilateral agreement according to which India will modernize parts of Chabahar Port (including container-handling facilities), which is Iran's only oceanic port, situated on the Arabian Sea about 160 km west of Gwadar (Pakistan) (Blarel, 2017, p. 263, p. 267). The investment is supported by a USD 150 million credit line to Iran through the Exim Bank of India. India has also agreed to finance the construction of a 500 km rail link to the Trans-Iranian railroad network at a cost of USD 1.6 billion. These measures would allow Indian goods to circumvent Pakistani land routes to Central and Western Asia by connecting ports on the Western coast of India to Chabahar Port and from there linking up to the Iranian railroad system, which itself has recently connected to Kazakhstan – thanks to a Chinese-funded project.

Myanmar has become an important partner for Beijing recently: Chinese-Myanmar pipelines have already opened up Chinese seaborne access – making it possible to avoid the Strait of Malacca – to coveted energy supplies from the Middle East. Thus, a natural gas pipeline from the deep-water port of Kyaukpyu (Myanmar) in the Gulf of Bengal via Mandalay to Kunming went into operation in October 2013, followed by an oil pipeline running parallel to the gas pipeline, through which the “black gold” started to flow in January 2015. Both projects together have cost USD 2.5 billion, have been implemented by the China National Petroleum Corporation (CNPC) and a Myanmar firm, and have been financially supported by the SRF. Yet the pipelines have also triggered protests over environmental and safety concerns and inadequate compensation arrangements for expropriated farmers. However, Beijing has promised to pay up to USD 1.8 billion on average per year in royalties over 30 years to the Myanmar authorities (Meyer, 2015). Plans have most recently emerged for the construction of a railroad line near the above trajectory, which could facilitate shipment of precious Burmese wood to China and flows of Chinese workers to the Bengali coast.

Bangladesh: It was an OBOR project in Bangladesh that was the first project the AIIB approved without cofinancing from any other international financial institution. In June 2016, a loan of USD 165 million was approved for the upgrade and expansion of the electricity distribution system in northern Dhaka and in rural Bangladesh. The Chinese authorities are also supporting the establishment of special economic and industrial zones in the country.

Sri Lanka is strategically located on China’s maritime energy supply lanes from the Persian Gulf and Africa and its export avenues to Europe and other regions. The SRF is financing a large real estate development, called Colombo Port City, in the country’s capital, with the state-owned China Harbor Engineering Company participating in the construction of a new container terminal, a marina, hotels, apartments, office buildings and shopping malls, to be placed on land reclaimed from the sea off the coast of Colombo harbor at a cost of USD 1.4 billion. China will be given a lease on a large part of the port city for 99 years. Overall, Chinese firms have reportedly invested more than USD 5 billion in Sri Lanka in roads, ports, airports, power stations and other infrastructure; temporarily, more than 30,000 Chinese workers were employed on the island (Zand, 2016, p. 93–94).²⁶

3.3.3 East Africa and the Middle East

Kenya: After the old railway between Mombasa and Nairobi dating back to colonial times was run down in recent decades, the Kenyan authorities decided to modernize the connection. The link between East Africa’s largest sea port and Kenya’s capital is part of the East African Railway Master Plan, which aims to raise connectivity throughout the region by extending high-capacity rail links also to Uganda, South Sudan, Rwanda, the Democratic Republic of Congo and other neighboring countries. The prime contractor on the Mombasa-Nairobi project is the China Road and Bridge Corporation. The project’s cost is estimated at USD 3.8 billion, 90% of which China EXIM Bank has agreed to finance with a loan, while the Kenyan government is contributing the remaining 10%. Construction of the line began in

²⁶ *Colombo Port City is regarded as the largest single incident of FDI in Sri Lanka’s history.*

late 2013 and is due to be completed by late 2017.²⁷ Thus, efficient international trade outlets for oil and other raw materials, but also for industrial products, are emerging.

Djibouti and Ethiopia: After building infrastructure from 2010 for a total of USD 12 billion that now includes three ports, two airports, water and gas pipelines and a railroad to Addis Ababa (Ethiopia)²⁸, China signed a ten-year lease agreement with the Djibouti authorities in early 2016 for establishing a naval base (in direct neighborhood of an existing U.S. base). China hopes to contribute to strengthening regional security on the southern gateway from the Indian Ocean to the Red Sea and the Suez Canal, one of the world's biggest shipping lanes and a pivotal part of the MSR (Page 2016).²⁹

Egypt and Israel: To strengthen security of transportation on the seaborne route to European markets, China has strived to establish an alternate passage to the Mediterranean from the Red Sea – apart from the Suez Canal and Port Said in Egypt, where Chinese firms manage big container terminals: Chinese enterprises in 2012 already agreed with the Israeli government to contribute to the construction of a railroad (called the Red-Med) leading from Eilat on the Gulf of Aqaba to Ashdod on the Mediterranean coast. Containers would be unloaded at Eilat and conveyed by rail to Ashdod, from where they would be reloaded on ships and continue their journey to European ports, first and foremost to Piraeus (see map 2). Should there be an outbreak of unrest in the neighborhood that could trigger shipping disruptions in the Suez Canal, this “land bridge” could be used to uphold trade connectivity with Europe and also more easily access the Israeli market.³⁰ The cost of the project is estimated at USD 4.9 billion. In mid-2014, the China Harbor Engineering Company was commissioned to construct a large container terminal in Ashdod for USD 930 million (Scott, 2014, p. 12; Zand, 2016, p. 96).

3.4 Some important projects that are still in their initial stage or that have run into problems

More than 50% of China's natural gas imports already come overland from Kazakhstan and Turkmenistan (through pipelines constructed in 2009 and 2010) and the percentage of gas imported overland will increase once Siberian pipelines come online. According to plans of 2014, the Power of Siberia (Sila Sibiri) gas pipeline, leading from Russian Eastern Siberia and the Far East to the Chinese province of Heilongjiang (Manchuria) and to be built by Gazprom and the China National Petroleum Corporation (CNPC), was slated to deliver gas worth USD 400 billion over 30 years. While China has so far refused to provide a planned USD 25 billion loan³¹ earmarked for pipeline construction, a EUR 2 billion credit

²⁷ The projected continuation of the high-capacity rail line from the border to the Ugandan capital Kampala is estimated to cost USD 2.3 billion, the lion's share of which is also planned to be financed by China EXIM Bank. Completion is slated for 2020.

²⁸ This 750 km railroad line cost USD 3.4 billion, 70% of which was financed by China EXIM Bank, and was inaugurated in late 2016. Operations are currently managed by Chinese staff, while Ethiopian crews are being trained and are expected to take over after five years.

²⁹ About half of China's oil imports reportedly pass through the Red Sea and past Djibouti.

³⁰ The Red-Med would not be unaffected by possible security problems linked to the Israeli-Palestinian conflict, though.

³¹ This refusal was apparently due to disagreements on interest rates to be paid for the loan (Farchy, 2016).

line was eventually granted and construction has reportedly begun on both Russian and Chinese territory. However, given the price slump for hydrocarbons from late 2014, there are concerns that the project may be unprofitable to Gazprom if the gas price does not recover again.³² That said, most recently Gazprom CEO Alexey Miller affirmed that construction will be finished as planned in 2019 and that the Sila Sibiri pipeline will start supplying gas to China before end-2019 (Foy, 2017). Delays have occurred in the financing and realization of the Altay gas pipeline, also called Western Route or Power of Siberia II, leading from Western Siberia via the Altay range to Xinjiang. The slower growing Chinese economy and Western restrictions on the sale of high technology for oil and gas exploration to Russia may have also contributed to rendering these megaprojects more difficult (Gabuev, 2016a, p. 7–8, p. 11).³³

Though the practices still seem to be in a very early stage, the use of Chinese technology in offshore drilling in Russia and renminbi-yuan-denominated oil contracts represent two remarkable recent phenomena in the hydrocarbons sector. The first experiment in this respect was Rosneft's September 2015 deal with a subsidiary of the China National Offshore Oil Company, involving the drilling of two oil wells in the Sea of Okhotsk (Gabuev, 2016a, p. 10).³⁴

Another OBOR project that encountered problems of a different, partly political, nature which contributed to its cancellation was the planned deep-sea port at Sonadia in the Bay of Bengal (Bangladesh). China responded positively to a Bangladeshi request for help in building a deep-sea port in Sonadia. The Chinese authorities submitted a detailed project proposal and offered loans to cover a major part of the estimated project cost of USD 8 billion. Sonadia could have been an alternative point of access to China via the Bay of Bengal and Myanmar, besides the deep-sea port of Kyaukpyu (see above). It would have further eased China's dependence on sea routes through the Strait of Malacca. But the two sides unexpectedly failed to sign an agreement during the Bangladeshi Prime Minister's visit to Beijing in July 2014. In February 2015, the Bangladeshi authorities called off the project. This was because in 2014, Japan had come up with a rival proposal for a project at Matarbari, 25 km from Sonadia, which would include not only a deep-water port, but four coal-fired power plants and an LNG terminal, and would cost only USD 5 billion. As Japan's terms were more favorable, the government opted for the Matarbari project. Geopolitical factors seem to have played a role too: India, Bangladesh's big neighbor, and the United States, wary of Beijing's growing presence in the Indian Ocean, are reported to have "persuaded" Bangladesh to cancel the OBOR project (Ramachandran, 2016).

³² By end-2016, only about one-sixth of the planned total length of the pipeline had reportedly been built. (Vercueil, 2017, p. 51).

³³ Thus, Western sanctions on Russia have paradoxically exerted contradictory influences on NSR projects in the country by rendering access to some specific project inputs more difficult, while prompting the authorities to facilitate some general business conditions for Chinese investors.

³⁴ Given pronounced differences in economic size and influence of the two countries, today's Sino-Russian relationship is clearly an asymmetrical one, with Moscow being the "junior partner." Asymmetrical relationships between the two Eurasian big powers with Beijing holding (de facto) preeminence are by no means new in history. From the establishment of a common border and of official trade ties between the czardom and the Qing empire in the second half of the 17th century, Russia was the less powerful of the two for at least one and a half centuries and did not appear to be particularly affected by that position (Barisitz, 2017, p. 186, p. 228, p. 239).

Table 2

Chinese investment and construction contracts in transportation and energy sectors (USD million)

Central Asia	2012	2013	2014	2015	2016	Total (2012–2016)	Total Chinese contract amounts as a ratio to host country GDP (%) ¹
Kazakhstan	2,100	5,300	1,620	470	340	9,830	1.07
Kyrgyz Republic	–	–	3,400	400	–	3,800	11.57
Mongolia	–	–	–	1,500	–	1,500	2.55
Tajikistan	350	–	–	–	–	350	0.89
Turkmenistan	2,920	–	400	–	–	3,320	1.78
Uzbekistan	2,270	460	180	–	150	3,060	0.92
Regional total	7,640	5,760	5,600	2,370	490	21,860	1.39
Russia and Eastern Europe	2012	2013	2014	2015	2016	Total (2012–2016)	Total Chinese contract amounts as a ratio to host country GDP (%) ¹
Belarus	740	–	–	300	–	1,040	0.38
Croatia	–	–	130	–	–	130	0.05
Georgia	130	–	–	260	160	550	0.79
Greece	150	300	200	–	1,130	1,780	0.18
Hungary	990	–	–	1,330	–	2,320	1.07
Latvia	–	–	–	–	110	110	0.08
FYR Macedonia	–	400	–	–	–	400	0.79
Montenegro	–	–	1,120	–	–	1,120	5.61
Poland	100	750	200	–	–	1,050	0.04
Romania	1,300	540	–	680	–	2,520	0.28
Russian Federation	600	3,160	7,160	2,930	2,230	16,080	0.25
Serbia	–	1,900	1,200	–	620	3,720	2.04
Ukraine	–	–	–	–	180	180	0.04
Regional total	4,010	7,050	10,010	5,500	4,430	31,000	0.24
West Asia	2012	2013	2014	2015	2016	Total (2012–2016)	Total Chinese contract amounts as a ratio to host country GDP (%) ¹
Iran	1,250	–	500	500	2,030	4,280	0.20
Saudi Arabia	650	390	1,780	840	510	4,170	0.13
Turkey	1,700	3,080	–	1,300	660	6,740	0.19
United Arab Emirates	200	160	310	460	3,710	4,840	0.26
Regional total	3,800	3,630	2,590	3,100	6,910	20,030	0.19
South Asia	2012	2013	2014	2015	2016	Total (2012–2016)	Total Chinese contract amounts as a ratio to host country GDP (%) ¹
Bangladesh	380	460	2,510	3,950	7,530	14,830	1.52
India	200	2,700	400	480	130	3,910	0.04
Nepal	–	250	320	1,200	–	1,770	1.70
Pakistan	200	8,810	6,750	13,380	5,180	34,320	2.54
Sri Lanka	400	1,230	2,170	1,040	2,550	7,390	1.80
Regional total	1,180	13,450	12,150	20,050	15,390	62,220	0.47
Southeast Asia	2012	2013	2014	2015	2016	Total (2012–2016)	Total Chinese contract amounts as a ratio to host country GDP (%) ¹
Brunei	–	–	–	530	–	530	0.68
Cambodia	1,270	660	–	130	840	2,900	3.21
Indonesia	2,930	1,260	2,030	6,160	2,060	14,400	0.33
Laos	740	1,080	–	2,900	5,670	10,390	16.85
Malaysia	330	2,860	2,870	6,890	6,860	19,810	1.34
Myanmar	–	–	370	–	2,100	2,470	0.76
Philippines	–	600	1,000	–	480	2,080	0.14
Singapore	–	150	490	–	450	1,090	0.07
Thailand	370	110	–	3,180	–	3,660	0.19
Vietnam	400	1,900	–	3,230	320	5,850	0.60
Regional total	6,040	8,620	6,760	23,020	18,780	63,200	0.52
East Africa and Middle East	2012	2013	2014	2015	2016	Total (2012–2016)	Total Chinese contract amounts as a ratio to host country GDP (%) ¹
Djibouti	510	190	–	1,020	–	1,720	21.60
Egypt	320	3,100	–	600	4,920	8,940	0.54
Ethiopia	1,580	4,590	1,050	710	540	8,470	2.75
Israel	140	–	950	2,390	260	3,740	0.25
Kenya	6,740	620	1,010	130	3,630	12,130	3.83
Uganda	1,950	4,350	–	1,800	–	8,100	6.14
Regional total	11,240	12,850	3,010	6,650	9,350	43,100	1.11
Memorandum item (for comparison)	2012	2013	2014	2015	2016	Total (2012–2016)	Total Chinese contract amounts as a ratio to host country GDP (%) ¹
Australia	4,550	4,620	5,020	3,240	3,840	21,270	0.32
Germany	510	400	640	220	3,700	5,470	0.03
Italy	460	–	6,200	7,860	–	14,520	0.16
United Kingdom	2,230	750	530	1,300	2,750	7,560	0.05
United States	3,600	3,210	3,860	3,290	2,720	16,680	0.02

Source: China Global Investment Tracker (March 2017), published by American Enterprise Institute and Heritage Foundation.

¹ The respective countries' GDP in 2015 is taken as denominator. The contract sum total for the period from 2012 to 2016 is divided by the number of years of this period (5) and related to 2015 GDP.

3.5 A fresh and comparative look at Chinese investment contracts along the NSR

Table 2 provides data on Chinese FDI and construction contracts in the transportation and energy sectors that have been concluded with OBOR partners and some neighboring countries. These data were collected by the China Global Investment Tracker and published by the American Enterprise Institute and the Heritage Foundation and are not necessarily compatible with the selected project data as presented and described above.³⁵ Yet, like the data presented in table 1, they do give an idea of the large sums involved: dozens of billions of U.S. dollars of Chinese project financing injected into each highlighted region. Many of the investments are currently in full swing and promise to bring about palpable changes as regards connectivity and economic dynamism in some important parts of Eurasia, notably in a number of China's Asian neighbors, including Russia. Countries and regions farther afield, like SEE, are also likely to receive a boost from the NSR. The total sum of annual average transportation and energy investment in OBOR partners outside China that is stimulated by financial participation or lending from China has corresponded to an average ratio of 0.4% to 0.5% of Chinese GDP in recent years.

4 Summary and conclusions

China's *New Silk Road (NSR)* or *One Belt, One Road (OBOR)* initiative was officially launched in 2013. It focuses on linking China and Europe through increased connectivity and building or modernizing infrastructural trajectories, which include rail, road, port, airport, pipeline, energy and communication infrastructure and logistics. OBOR consists of an overland and a maritime branch. The overland *Silk Road Economic Belt (SREB)* comprises various economic corridors which aim to bring China, Central Asia, Russia and Europe closer together (e.g. the *New Eurasian Land Bridge*) as well as to connect China to the Indian Ocean and the Mediterranean Sea through Central Asia and West Asia (e.g. the *China-Pakistan Economic Corridor*) or to strengthen links with Southeast and South Asia. The *21st Century Maritime Silk Road (MSR)* is designed to go from China's coast to Europe through the South China Sea and the Indian Ocean, linking up en route with Southeast Asia, South Asia, East Africa and the Mediterranean.

The Chinese authorities have entrusted specific institutions with supporting NSR schemes: the *Silk Road Fund (SRF)*, capital: ca. USD 55 billion), the *Asian Infrastructure Investment Bank (AIIB)*, the *New Development Bank* (established by the BRICS member states), the *China EXIM Bank*, the *China Development Bank* and the *Agricultural Development Bank of China*.

The motivations and drivers of China's OBOR initiative are mostly of an economic or geopolitical nature: improvement of transport links; reduction of trade costs; reutilization of domestic overcapacities; diversification of investments, markets and suppliers; development of peripheral domestic regions (e.g. Xinjiang); contribution to the internationalization of the renminbi-yuan; enhancement of security of access to strategic energy and resource supplies; hedging against possible trade wars, etc.

³⁵ The investment data collected by the China Global Investment Tracker (<https://www.aei.org/china-global-investment-tracker/>) not only cover the transportation and energy sectors but also real estate, technology and other industries. The transportation and energy sectors were singled out for table 2 because they appear to provide the most plausible approximation to what NSR projects typically constitute (see also discussion of this source in Grübler and Stehrer, 2017, p.5).

Challenges and risks include weak local governance and possible political instability in host countries. Given that maritime container transportation is substantially cheaper over long distances than transcontinental rail or road conveyance, the lion's share of long distance trade over the NSR is likely to remain seaborne. However, apart from the fact that overland transportation is faster, the modernization of overland links, which are relatively weakly developed across Eurasia, is bound to reduce the price difference somewhat. A profitable niche for long-haul rail conveyance of high value-added and/or time-sensitive products seems to have emerged (including the *Trans-Eurasia-Express*, running from Chongqing via Astana and Moscow to Duisburg). Moreover, China's trade with its immediate Eurasian neighbors (where there is little or no maritime competition) should clearly benefit from such efforts.

As of end-2016, all NSR projects actually in development are estimated to represent a total value of about USD 290 billion. Overall, while considerable resources have been devoted to MSR development, investments in SREB rail and road connections, against the backdrop of the huge modernization potential in this latter area, are now somewhat improving the competitiveness of Eurasian overland links. Thanks to the generous financial means at Beijing's disposal (funds of at least USD 130 billion, not including funds from multilateral institutions) and the considerable experience Chinese firms have already accumulated in realizing domestic infrastructure projects, many OBOR investments are currently in full swing.

The lion's share of Chinese NSR investments currently goes to Pakistan, Bangladesh, Malaysia, Indonesia, Russia, Kazakhstan and Kenya. However, compared to the size of respective host economies, strategically situated smaller countries typically benefit the most: Djibouti, Sri Lanka, Mongolia, Kyrgyzstan, Laos, Cambodia, Serbia and Montenegro. The NSR promises to (eventually) bring about palpable changes as regards connectivity, commerce and economic dynamism in some important parts of Eurasia (including Southeastern Europe), which will be better linked up with – and more interdependent with – China once the NSR projects have been implemented.

References

- Barisitz, S. 2017.** Central Asia and the Silk Road – Economic Rise and Decline over Several Millennia. Studies in Economic History. Springer International Publishing: Heidelberg, New York.
- Blank, S. 2017.** Washington et le retour du pivot au centre de l'Asie. In: Korinman, M. (ed.). Chaosland: du Moyen-Orient à l'Asie (du centre)? 208–216.
- Blarel, O. 2017.** L'Inde et l'Asie centrale: une émergence régionale au défi du facteur pakistanais. In: Korinman, M. (ed.). Chaosland: du Moyen-Orient à l'Asie (du centre)? 258–267.
- Boquérat, G. 2017.** Perspective indienne sur la Russie. In: Diplomatie – Affaires stratégiques et relations internationales 86. May–June. 56–59.
- China-Britain Business Council, Foreign & Commonwealth Office. 2016.** One Belt, One Road – A Role for UK companies in developing China's new initiative – New Opportunities in China and beyond. http://www.cbbc.org/cbbc/media/cbbc_media/One-Belt-One-Road-main-body.pdf
- Clover, C. and L. Hornby. 2015.** China's Great Game: Road to a New Empire. In: Financial Times. October 12. <https://www.ft.com/content/6e098274-587a-11e5-a28b-50226830d644>
- Djankov, S. and S. Miner. (eds.). 2016.** China's Belt and Road Initiative – Motives, Scope, and Challenges. Peterson Institute for International Economics. Briefing 16–2, March. <https://piie.com/publications/piie-briefings/chinas-belt-and-road-initiative-motives-scope-and-challenges>
- Egorova, K. 2017.** Why China launched a freight train to London via Kazakhstan and Russia. In: Russia beyond the headlines. January 13. https://www.rbth.com/business/2017/01/13/why-china-launched-a-freight-train-to-london-via-kazakhstan-and-russia_680196/
- Escobar, P. 2015.** Is there a place for the West along China's Silk Road? In: The Nation. November 23. www.thenation.com/article/is-there-a-place-for-the-west-along-chinas-new-silk-road/
- Ettinger, V. 2016.** Österreich im Paradigma der Neuen Seidenstraße. ChinaContact. Juni.
- Farchy, J. 2016.** Gazprom secures EUR 2 billion loan from Bank of China. In: Financial Times. March 3. <https://www.ft.com/content/ac5b1ee4-e159-11e5-9217-6ae3733a2cd1/>
- Farchy, J., J.Kynge, C.Campbell and D. Blood. 2016.** One Belt, One Road – A Ribbon of Road, Rail and Energy Projects to Help Increase Trade. In: Financial Times. Special report. September 14. <http://ig.ft.com/sites/special-reports/one-belt-one-road/>
- Foy, H. 2017.** Gazprom confident of \$400 bn Chinese gas supply. In: Financial Times. July 6. <https://www.ft.com/content/623c7396-60cc-11e7-91a7-502f7ee26895>
- Gabuev, A. 2016a.** Friends with Benefits? Russian-Chinese Relations after the Ukraine Crisis. June 29. carnegieendowment.org/files/CEIP_CP278_Gabuev_revised_FINAL.pdf
- Gabuev, A. 2016b.** China's One Belt, One Road Initiative and the Sino-Russian Entente. Interview by G. Shtraks. The National Bureau of Asian Research. Policy Q&A. August 9. www.nbr.org/research/activity.aspx?id=707
- Giret, J.P. and V. Giret (eds.). 2016.** Chine – une emprise de fer dans un gant de soie. In: L'Atlas des empires – Où est le pouvoir aujourd'hui? Le Monde. Hors série. October.
- Grieger, G. 2016.** One Belt, One Road (OBOR): China's regional integration initiative. Briefing. European Parliamentary Research Service. July. [www.europarl.europa.eu/RegData/etudes/BRIE/2016/586608/EPRS_BRI\(2016\)586608_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/586608/EPRS_BRI(2016)586608_EN.pdf)
- Grübler, J. and R. Stehrer. 2017.** Die Chinesische Investitionsoffensive „One Belt, One Road“. Wirtschaftliche Potenziale für Österreich? Wiener Institut für internationale Wirtschaftsvergleiche (wiiw). Policy Brief No. 33. February.
- Havlik, P. 2015.** Russia – Economic Turmoil and Policy Options: Reorientation Away from the EU? 77th East Jour Fixe of the Oesterreichische Nationalbank. May.
- Marchand, P. 2015.** Atlas géopolitique de la Russie – La puissance retrouvée, Éditions Autrement. October.

- Meyer, E. 2015.** With Oil and Gas Pipelines, China Takes a Shortcut through Myanmar. *Forbes*. September 2. www.forbes.com/sites/ericmeyer/2015/02/09/oil-and-gas-china-takes-a-short-cut/#75b8a4ef7aff
- Nemitz, F. 2017.** Im Fokus: Kasachstan: Transport – Es bleibt noch viel zu tun. In: *Ostwirtschafts-report*, April 25. 2.
- Page, J. 2016.** China Builds First Overseas Military Outpost. In: *The Wall Street Journal*. August 19. www.wsj.com/articles/china-builds-first-overseas-military-outpost-1471622690
- Ramachandran, S. 2016.** China's Sinking Port Plans in Bangladesh. In: *China Brief*. Vol. 16. Issue 10. June 21. <http://jamestown.org/program/chinas-sinking-port-plans-in-bangladesh/>
- Scott, E. 2014.** China's Silk Road Strategy: A Foothold in the Suez, But Looking to Israel. In: *China Brief*. Vol. XIV. Issue 19. October 10.
- Shepard, W. 2016.** Why the China-Europe 'Silk Road' Network Is Growing Fast. In: *Forbes*. 28 January. www.forbes.com/sites/wadeshepard/2016/01/28/why-china-europe-silk-road-rail-transport-is-growing-fast/#4309bc40659a
- Shepard, W. 2017.** 2 Days from China to Europe by Rail? Russia Going for High-Speed Cargo Trains. In: *Forbes*. January 14. www.forbes.com/sites/wadeshepard/2017/01/14/2-days-from-china-to-europe-by-rail-russia-going-for-high-speed-cargo-trains/#3f00824f54af
- State Council – The People's Republic of China (ed.). 2015.** Full text: Action plan on the Belt and Road Initiative. March 30. http://english.gov.cn/archive/publications/2015/03/30/content_281475080249035.htm
- Thorez, J. 2016.** La « nouvelle route de la soie » : une notion porteuse d'illusion. In: *L'Asie centrale – Grand Jeu ou périphérie: Kazakhstan, Kirghizistan, Ouzbékistan, Tadjikistan et Turkménistan. Questions internationales. La documentation Française*. 33–41.
- Urban, W. 2016.** The New Silk Road: China's Belt and Road Initiative. *wiiw Monthly Report*. October.
- Vercueil, J. 2017.** L'Asie, un axe économique et stratégique pour la Russie. In: *Diplomatie – Affaires stratégiques et relations internationales* 86. May–June. 51–55.
- Wildau, G. and M. Nan. 2017.** Silk Roads in charts: China's Belt and Road Initiative – FDI and exports are down, but construction revenue is up. In: *Financial Times*. May 11.
- Wuttke, J. 2017.** Xi Jinping's Silk Road is under threat from one-way traffic – Trade must flow both ways to make the route economically and politically viable. In: *Financial Times*. May 9.
- Yalcin, E. et al. 2016.** New trade rules for China? Opportunities and threats for the EU. Ifo Institute. Leibniz Institute for Economic Research at the University of Munich. Commissioned by the European Commission and the European Parliament. February. [www.europarl.europa.eu/RegData/etudes/STUD/2016/535021/EXPO_STU\(2016\)535021_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/535021/EXPO_STU(2016)535021_EN.pdf)
- Yousafzai, F. 2016.** China to build mega oil pipeline from Gwadar to Kashgar. In: *The Nation*. June 13. <http://nation.com.pk/national/13-Jun-2016/china-to-build-mega-oil-pipeline-from-gwadar-to-kashgar>
- Zand, B. 2016.** Ehrgeiz einer Seemacht – Mit einer "Maritimen Seidenstraße" will sich Peking die Weltmeere erschließen. In: *Der Spiegel*. 36/2016. September 3. 92–96.

Websites

- Asian Infrastructure Investment Bank.** www.aiib.org/en/index.html
- China Global Investment Tracker.** www.aei.org/china-global-investment-tracker/
- ECB. Statistics.** www.ecb.europa.eu/stats/html/index.en.html
- IMF. International Financial Statistics.** <http://data.imf.org/?sk=5DABAFF2-C5AD-4D27-A175-1253419C02D1>
- Silk Road Fund.** www.silkroadfund.com.cn/enweb/23809/23812/index.html

Competitiveness of CESEE EU Member States: recent trends and prospects

This short study gives a comprehensive overview of the competitive strengths and weaknesses of the 11 Central, Eastern and Southeastern European (CESEE) EU Member States over the period from 2000 to 2014. It reviews traditional measures such as market share and price developments as well as indicators reflecting nonprice competitiveness and the influence of integrated production networks. While the CESEE countries have shown impressive improvements in their competitiveness over the review period, some of these gains are clearly associated with processing high-quality inputs, the transfer of technological and managerial know-how within international production networks and the participation in potent marketing and distribution networks. However, the CESEE countries continue to lag behind Western Europe with respect to infrastructure, institutions and innovation.

Doris Ritzberger-Grünwald,
Josef Schreiner, Julia Wörz¹

JEL classification: F14, L15, P52

Keywords: competitiveness, international production networks, CESEE

The opening of the countries of Central, Eastern and Southeastern Europe (CESEE) after the fall of the Iron Curtain went hand in hand with remarkable economic modernization and the region's integration into European and global economic structures. The related boost to economic performance was substantial. Between 1992 and 2008, average real per capita income measured in purchasing power parities in today's CESEE EU Member States² rose continually from 35% to 55% of the level of the euro area countries. Average GDP growth increased from around 2% in the late 1990s to a record of around 6.5% in 2006 and 2007, implying a substantial growth differential against the countries of Western Europe. This growth advantage reached its peak in the early 2000s at levels of around 3 to 3.5 percentage points (chart 1, left-hand panel). While the economic crisis that unfolded in 2008 put a brake on convergence, CESEE countries again started to outpace euro area countries in terms of growth from 2011 onward.

The CESEE region seized the opportunity of liberalized market access and promoted the export of goods and services to the rest of Europe and to other countries around the world. Between 2000 and 2014, international market shares increased for all CESEE countries, even though individual country performances were heterogeneous (chart 1, right-hand panel). In cumulative terms, the global export market shares of Slovakia, Slovenia and Bulgaria expanded by 20% to 25% in this period while they quadrupled for Romania.³ Furthermore, Latvia, Estonia and the Czech Republic more than doubled their world market shares, while Croatia, Hungary and Poland experienced an increase of around 40%. This strong

¹ Oesterreichische Nationalbank, Economic Analysis and Research Department, doris.ritzberger-gruenwald@oenb.at, and Foreign Research Division, josef.schreiner@oenb.at and julia.woerz@oenb.at (corresponding author). The authors are deeply indebted to Konstantins Benkovskis (Stockholm School of Economics in Riga and Latvijas Banka) for his updated measures of nonprice competitiveness and value-added market shares. The authors would like to thank Peter Backé and Martin Feldkircher (all OeNB) as well as an anonymous referee for helpful comments and valuable suggestions.

² In this analysis we cover the 11 EU Member States in CESEE: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

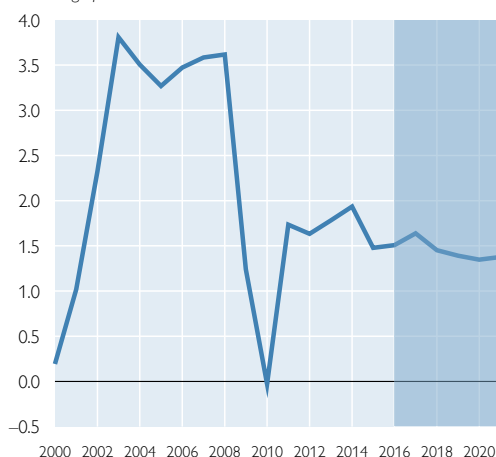
³ Romania attained a global market share of 0.7% in 2000 and reached 0.33% in 2014 while Bulgaria's market share expanded from 0.12% to 0.15% in the same period.

Chart 1

Growth performance and development of international market shares

GDP growth differential between CESEE and euro area

Percentage points

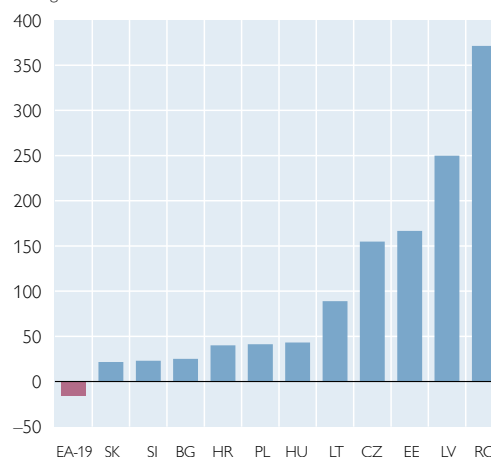


Source: IMF, Eurostat.

Note: EA=euro area.

Growth in export market shares

Change in % between 2000 and 2014



performance of all CESEE countries is remarkable given the increasing importance of large global traders such as China and other emerging economies over this period. Even the crisis of 2008 only temporarily affected the performance of CESEE. More than half of the region under observation continued to report further gains in international market shares in the period from 2009 onward, despite substantial downturns in GDP growth in some countries. It is therefore safe to say that – drawing on a definition of competitiveness as the ability to sell products on the world market – the CESEE region not only experienced a boost to economic growth, but also a boost to international competitiveness.

The roots of this performance are not easy to identify, and looking at price and cost measures would clearly be too narrow a focus. In this article⁴ we concentrate on traditional and novel indicators of competitiveness and describe the relative position of CESEE EU Member States compared to the average performance of the euro area. In section 1 we focus on measures of price competitiveness, in section 2 we complement this “narrow” view with a discussion of quality improvements, while in section 3 we turn to a more differentiated view which explicitly takes into account the consequences of the international fragmentation of production. The integration into global (or, in the case of CESEE, mostly European) production networks implies that traditional measures of competitiveness based on the performance of gross exports and general price developments may yield a misleading picture. When countries specialize in certain stages of the production process, the relative price of the total export good is not a good indicator of competitiveness, and a more refined view that differentiates between domestic and foreign value added in exports is called for. Combining the evidence explained

⁴ A short version of the key findings of this article was published in the White Paper entitled “Beyond the Equity-Efficiency Trade-Off: Practical Ideas for Inclusive Growth and Competitiveness in Europe,” published by the European Investment Bank (EIB) and the World Economic Forum in 2017.

in the first three sections of this paper, we identify future potential for competitiveness and discuss existing shortcomings in sections 4 and 5. We conclude with policy priorities for a sustained competitive economy.

1 Traditional price-based measures of competitiveness

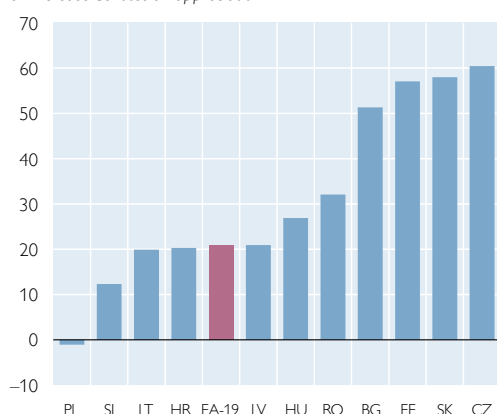
In the period between 2000 and 2014, CESEE countries experienced a deterioration in their price competitiveness vis-à-vis the euro area. The deterioration was rather broad based among individual countries and was also evidenced by various indicators. Real effective exchange rates appreciated noticeably in many countries, and the growth of unit labor costs throughout the region⁵ (with the exception of Poland) outpaced that in the euro area (chart 2). The reasons for these developments are manifold and in part related to the transition process itself. For example, a convergence of wages closer to Western European standards and nominal currency appreciation were clearly a consequence of a successful catching-up process.

Chart 2

Real effective exchange rates and nominal unit labor costs

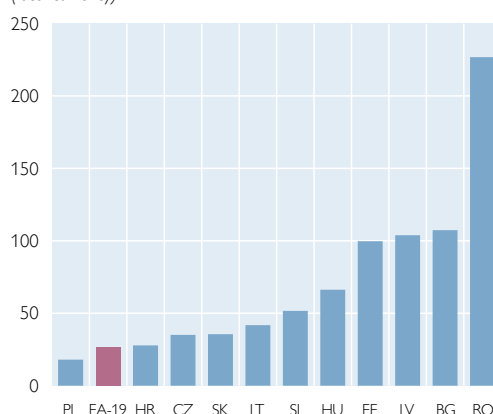
Real effective exchange rates

Change in % in the whole economy between 2000 and 2014, deflated by ULC;
an increase denotes an appreciation



Unit labor costs (ULC)

Change in % in the whole economy between 2000 and 2014
(local currency)



Source: AMECO, Eurostat.

Without any doubt, however, wage growth was excessive in several CESEE countries especially in the boom years before the crisis and it outpaced productivity gains that were also strong. Nominal compensation per employee more than doubled in 7 of the 11 countries under observation between 2000 and 2014, while it increased by only around 40% in the euro area on average (chart 3, left-hand panel). This translated into a strong growth of nominal unit labor costs and a related deterioration in price competitiveness, in particular in the Baltic countries, Bulgaria and Romania, but considerably less so in Croatia, Poland and the Czech Republic. At the same time – and thus countering these adverse wage developments at least to some extent – productivity advanced rather swiftly (chart 3, right-hand panel).

⁵ This finding is broadly robust across different definitions of unit labor costs and real effective exchange rates.

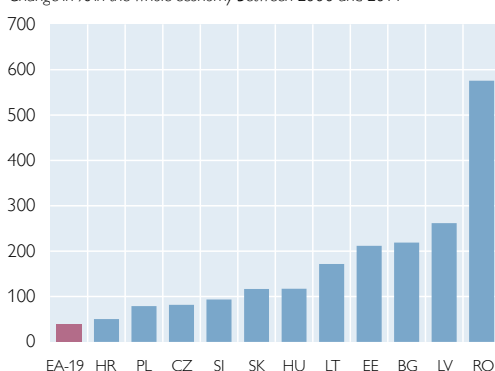
Again, this was in part related to transition, as the relocation of resources between sectors and higher labor market flexibility increased allocative efficiency and the introduction of new technologies – often related to foreign direct investment – increased technological efficiency. This led to a notable narrowing of the productivity gap between CESEE and the EU average. Real GDP per person employed – as a measure of productivity – advanced on average by around 50% in the CESEE region between 2000 and 2014. This compares to a plus of only 10% in the euro area in the same period.

Chart 3

Compensation of employees and productivity

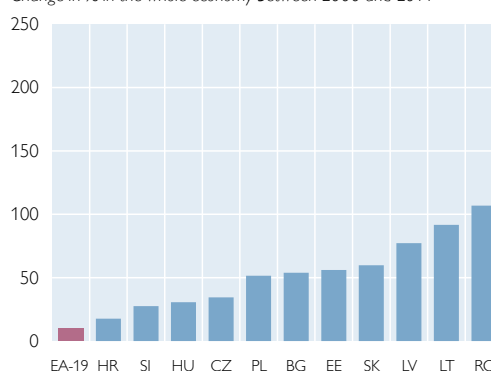
Nominal compensation per employee

Change in % in the whole economy between 2000 and 2014



Real GDP per employee

Change in % in the whole economy between 2000 and 2014



Source: AMECO.

2 Focus on quality improvements and export sophistication

As prices and costs alone cannot explain the development of CESEE countries' market shares, a broader definition of competitiveness is needed, and other factors, including quality upgrading, shifts in demand and the like also have to be taken into account. An economy's overall standing is shaped by a wide range of determinants. They include a country's endowments (including natural resources, geographic location, historical legacy, etc.), the macroeconomic, political, legal and social context given by the country's policies and institutions as well as microeconomic factors such as business environment, linkages and externalities between firms and their sophistication.

Furthermore, structural factors such as shifts in global demand patterns, the entry and exit of competitors and especially nonprice factors (including changes in product quality and consumers' tastes) play a crucial role. Goods within a single classification of the trade statistics are not homogenous but differ in terms of quality and other factors that influence the demand for that good (e.g. design, marketing, etc.).

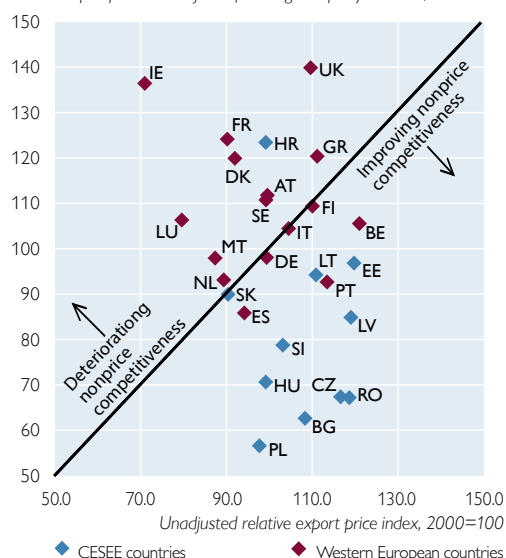
Nonprice competitiveness is clearly a key characteristic of CESEE export industries. Being mostly small and open economies, the new EU Member States were not able to exploit economies of scale to a large extent by entering mass production. Instead, they specialized in narrowly defined sectors and focused on providing parts and components as well as assembly activities, particularly so in the machinery and automobile industries. Chart 4.1 displays export prices relative to the world average in 2014 on the x-axis, while on the y-axis these prices are adjusted for quality

improvements in export goods.⁶ The difference between the two price indices reflects the overall improvement or deterioration in the quality of the goods exported by a particular country over time relative to the year 2000. Observations that fall on the 45° line reflect countries where changes in competitiveness were driven only by price factors (that means that a further adjustment for nonprice factors did not lead to changes in overall competitiveness). Observations below this line show countries whose quality-adjusted export prices rose less or declined more than unadjusted export prices. This difference reflects improvements in nonprice factors which led to a higher (physical or perceived) quality of the export products of this country. Vice versa, observations above the 45° line reflect countries whose quality-adjusted export prices rose more or declined less than unadjusted export prices relative to the world average. Chart 4.1 shows that quality improvements in export goods positively impacted the competitiveness of CESEE countries. Based on this indicator, almost all CESEE countries (with the exception of Croatia) outperformed the Western European countries, some – e.g. Poland, the Czech Republic, Bulgaria and Romania – substantially so. Quality upgrading in export goods therefore is an important explanatory factor for the region's gains in global market shares. It has to be emphasized here that chart 4.1 shows relative changes and does not allow a comparison of the absolute quality of export goods across countries. This means that even though countries like the Czech Republic and Romania show huge

Chart 4.1

Export prices relative to world average in 2014

Relative export price index adjusted for changes in quality and taste, 2000=100

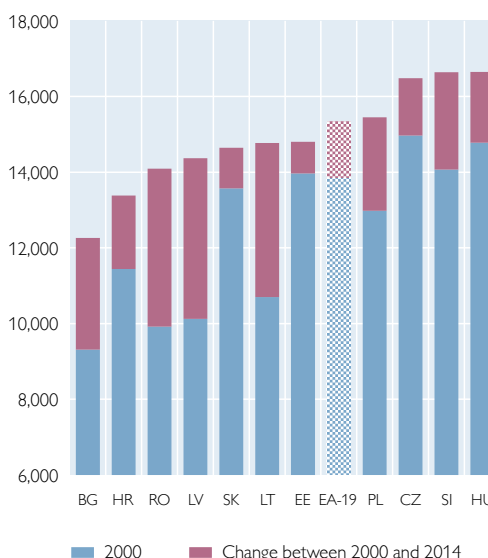


Source: ECB CompNet.

Chart 4.2

Export sophistication index for goods

USD



Source: ECB CompNet.

⁶ See Benkovskis and Wörz (2016a) for the derivation of the quality-adjusted relative export price index. This adjustment is based on the reasoning that the utility derived from consuming imported goods depends on the price of the good, the possibility of choosing between different varieties of the good, its physical attributes (objective quality) as well as intangible attributes such as labeling or meeting consumers' tastes (subjective quality). By solving this consumer maximization problem, it is possible to introduce nonprice factors into an index for relative import prices. This formula can be applied to export prices as exports are a mirror image of imports.

improvements in nonprice competitiveness, the quality of their export goods may still be lower in absolute terms than e.g. the quality of German export goods.

The improvements in the quality of CESEE export products are also corroborated by the observed trend toward more sophisticated export goods. Chart 4.2 shows that in 2014, the export production of four CESEE EU members (Poland, Slovenia, the Czech Republic and Hungary) was already more sophisticated than the euro area average. Furthermore, the export sophistication index for goods (measuring the similarity of a country's export bundle to the export bundle of rich countries) shows that most CESEE countries fared comparatively well: The index advanced on average by over 20% in the CESEE countries between 2000 and 2014, compared to only 10% in the euro area. The highest growth rates in CESEE were recorded by the countries with the largest gap in export sophistication back in 2000.

3 Integration into international production networks implies a more differentiated view on competitiveness

Today, the production of many common products is scattered all over the world. In fact, globalization has reached unprecedented levels: About 60% of world merchandise trade is trade in components. The international fragmentation of production has reshaped the implications of world trade for individual countries. Today the competitive strength of a country is crucially determined by its role within global value chains (GVCs).

The increasing integration of CESEE into international production networks is clearly visible in the data depicted in chart 5 (left-hand panel). The participation index given below can broadly be seen as an indicator of a country's openness reflecting the degree of integration into global production chains, with higher values indicating deeper integration into cross-border production structures. More precisely, the participation index measures both a country's use of imported intermediate goods in its own production and its supply of intermediates to be used in other countries' export production in relation to the country's total gross exports. As such it measures the importance of global supply chains for a country.⁷ In 2014, most CESEE countries were more integrated into GVCs than the euro area average. In fact, the Czech Republic, Hungary and Slovakia belong to the most economically integrated countries in Europe. They form part of the Central European automobile production cluster, centered on the (highly competitive) German car industry. Also, they have specialized in medium-high-tech products such as electrical machinery, motor vehicles and chemicals, which is not entirely surprising as these countries had performed particularly well and developed innovative concepts exactly in these segments in the 1920s (e.g. in the production of consumer goods). Some investors tried to pick up those loose ends after the beginning of transition and restarted the respective firms, which had been state-owned or closed in the socialist era. As a result, many CESEE countries report a clear comparative advantage in these industries vis-à-vis their competitors (chart 6, right-hand panel).

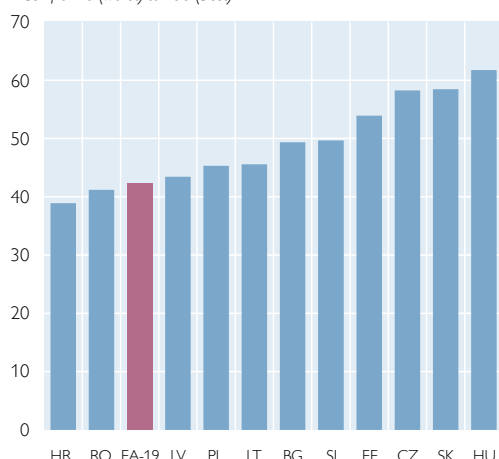
⁷ For more information concerning this indicator, see Karadeloglou and Benkovskis (2015), section 4.10.

Chart 5

Global value chains and comparative advantage

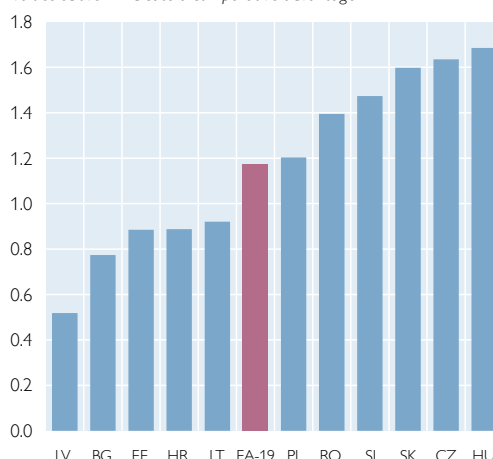
Participation in global value chains (2014)

Index from 0 (worst) to 100 (best)



Revealed comparative advantage in medium-high-tech goods

Values above 1 indicate a comparative advantage



Source: ECB CompNet.

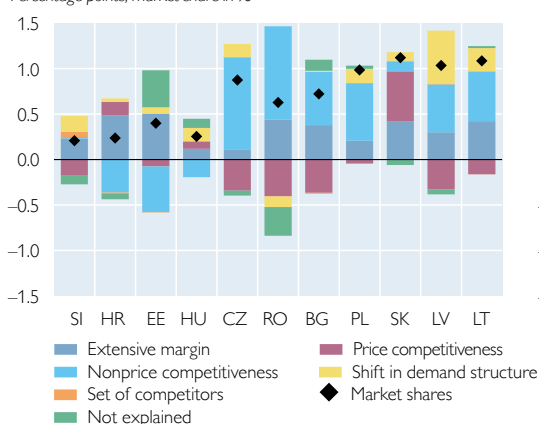
Chart 6 breaks down the gains in world market shares the CESEE countries achieved between 2000 and 2014.⁸ When using the traditional gross concept of trade flows (i.e. exports in the classical sense, incorporating both domestic and foreign value added in export goods), the analysis shows that CESEE countries improved their world market shares mainly on the basis of rising nonprice competitiveness and despite a loss in price competitiveness (chart 6, left-hand panel). Furthermore, the extensive margin (comprising changes in market shares related to entering

Chart 6

Decomposition of changes in world market shares

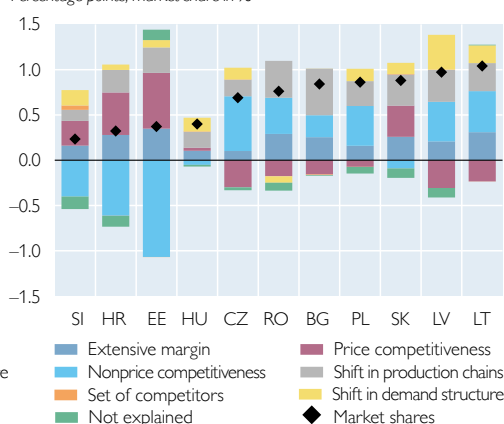
Based on gross exports (2000–2014)

Percentage points, market share in %



Based on value added in exports (2000–2014)

Percentage points, market share in %



Source: Update of Benkovskis and Würz (2016b).

⁸ See Benkovskis and Würz (2015) for an explanation of this breakdown. The method used to derive nonprice factors follows the same reasoning as the one described in footnote 6.

entirely new markets) played an important role. This was clearly related to the opening of the formerly centrally planned economies to world trade and the subsequently easier access to European and international markets.

The factors driving market share gains, however, change when the analysis is based on domestic value added in exports (i.e. when the value of domestic exports is adjusted for imported inputs into production). Taking this view, we observe that the positive contributions of the extensive margin and of nonprice competitiveness gains are notably smaller. Instead, we see that market share gains have strongly profited from shifts in production chains (see chart 6).

4 Future potential

Having identified the drivers of past export performance, the question arises which of these factors can serve as a sustainable basis for future improvements in international competitiveness. The favorable development of the extensive margin for sure was related to the integration of CESEE into the world economy after 1989 and as such cannot be easily reproduced. Nevertheless, there is evidence that CESEE countries still have a notable potential for tapping new markets (Silgoner et al., 2015).

In the period under observation, CESEE's participation in global value chains was associated with high-quality inputs, the transfer of technological and managerial know-how and the participation in potent marketing and distribution networks. All these developments clearly fueled the competitiveness of the CESEE economies. While it certainly makes sense for these countries to strive to reap these advantages also in the future, it is not entirely clear how much further the integration into international production networks can go. Furthermore, such policies can also be associated with certain risks. Export sectors are potentially too little diversified as – in the case of CESEE – countries are strongly linked to a single industrial center (Germany) and/or to only a few specific industrial sectors (e.g. automobiles). In case of turbulences in one of these areas or in case of increasing protectionism in traditional export markets, the implications for the whole economy might be substantial, including declining export production, pressure on the external accounts, lower employment, impediments to productivity growth and productivity spillovers from export-oriented firms to the whole economy and/or a reduced technology transfer.

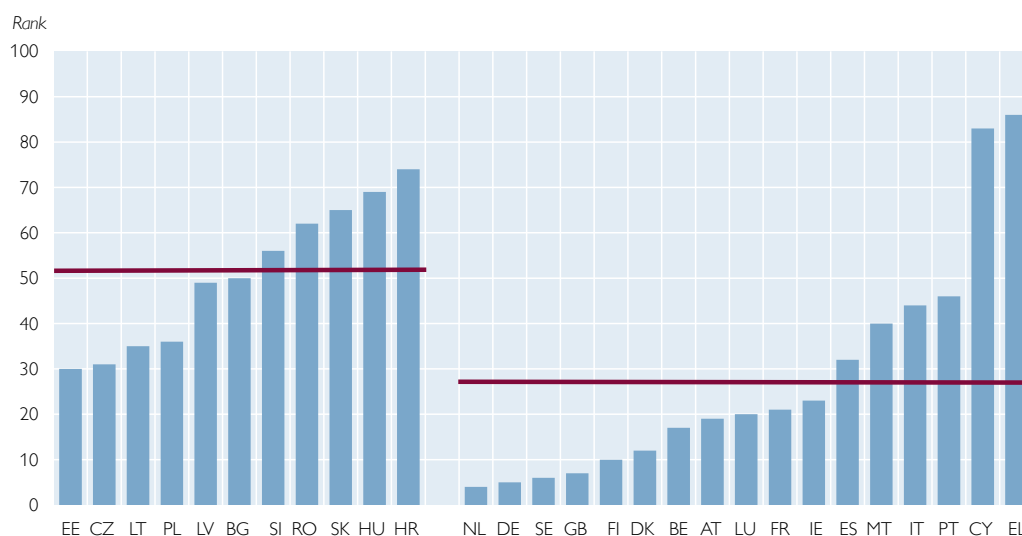
For CESEE, the largest potential probably lies in further quality improvements and boosts to nonprice competitiveness. There is evidence that the CESEE countries have gained competitiveness within production networks mainly by assembling rather than producing high-quality export goods. In other words, the domestic value added in those exports was often rather small. To some extent, the increasing quality of export goods in the period under observation was ascribable to the better quality of imported intermediate inputs rather than genuine quality improvements in domestic production. Put differently, these countries would have experienced even stronger gains in global market shares had they also increased the relative quality and valuation of the domestic content of their export goods or moved into higher value-added parts of the production chain.

5 Competitiveness gaps remain with respect to infrastructure and institutions

Against this background, it becomes clear that there is ample room for further improvements in CESEE's international competitiveness. In the respective rankings, CESEE countries still mostly occupy no more than mid-table positions. The CESEE region's average rank in the Global Competitiveness Report of the World Economic Forum for 2016–2017 was 51 compared to 28 for the Western European average. Chart 7 lists the rankings of all 28 EU Member States (a lower rank corresponds to a better performance). There is, however, a vast degree of variation among CESEE countries. Estonia and the Czech Republic, for example, are close to the Western European average, while Croatia occupies one of the last ranks in the EU.

Chart 7

Global competitiveness report: ranking of most competitive countries in 2016



Source: World Economic Forum.

Note: Red lines show the arithmetic average of the ranks of the CESEE EU Member States and of the non-CESEE EU Member States.

A closer look at the subindices of the ranking reveals that the CESEE countries lag behind Western European EU members especially in terms of innovation and sophistication factors. The gap is less pronounced in basic requirements (including factors such as the macroeconomic environment, health and education, etc.) and efficiency enhancers (including factors such as goods, labor and financial market efficiency). However, the variation in outcomes in individual subcomponents that make up the subindex “basic requirements” is very high. While the CESEE countries actually perform somewhat better than Western European countries in terms of macroeconomic environment and broadly similarly when it comes to health and education, there is a noticeable gap in the area of infrastructure and institutions.

Those findings are also corroborated by other indicators. For example, the European Innovation Scoreboard summary index reports an average reading of 0.3 for the CESEE countries compared to 0.52 for the euro area in 2015 (the index is normalized between 0 and 1, with higher values indicating better outcomes).

According to this indicator, the largest gaps exist in the areas of research systems and linkages and entrepreneurship (comprising factors such as innovation and collaboration in SMEs). At the same time, the CESEE countries score a comparatively high value for human resources (comprising achievements in tertiary education).

Institutional shortcomings are also documented by the World Bank's Worldwide Governance Indicators. For the CESEE countries an average score of 0.67 is reported, compared to 1.13 for euro area countries, in 2015 (scores range between -2.5 and 2.5, with higher values indicating better outcomes). Gaps are especially large when it comes to corruption and the rule of law. Also the EBRD Transition Report 2016-17 mentions a continued prevalence of informality and corruption and a mixed track record with respect to the enforcement of competition policies for the region. Yet, despite these observations the report also attests a comparatively good business environment for small and medium-sized enterprises (SMEs), which is ascribed to government efforts on streamlining administrative processes and the emergence of e-government measures (EBRD, 2016). The importance of a sound business environment is also underlined by firm-level studies. Crespo Cuaresma et al. (2014) show for the 11 CESEE EU countries that the perceived quality of business climate is an important determinant of the growth of firms. They also identify firms with high employment growth and a high probability to have survived the global financial crisis in 2009 – i.e. those firms that will represent the backbone of economic recovery after a crisis – to be highly sensitive to changes in the business environment.

Finally, let us mention two region-specific vulnerabilities: First, especially those countries that report a high energy intensity in production are negatively affected by strongly changing oil prices. Following their recent decline, oil prices are likely to rise back to higher levels. This is to be seen against the fact that energy use per unit of GDP is about 20% higher in the CESEE region than in the EU on average. Second, geopolitical uncertainty stemming from the Russia-Ukraine conflict, the situation in Turkey and other conflict zones in the neighborhood affect the CESEE countries more than others. Sanctions against Russia, but also politically unsustainable developments in Russia, Turkey and other emerging economies run contrary to a deepening of trade relations with these neighboring countries and potentially threaten to put the CESEE region in a peripheral position.

6 Conclusions

The CESEE economies have been successful in international markets not only due to cost advantages, but also owing to improvements in their nonprice competitiveness. Their export products show a high degree of sophistication and the countries have profited from their profound integration into international production networks. Their strong competitive performance in the recent past – as evidenced by strong world market share gains – notwithstanding, there are still some caveats that may limit CESEE's future competitiveness. Investments in infrastructure and institutions as well as the creation of a more innovation-friendly environment seem pivotal to sustaining and even improving the standing of the region in international markets. Measures in this respect include investment in physical infrastructures, the further development of political, legal and economic institutions, the fight against corruption and red tape, the support of research and scientific institutions with the purpose of developing marketable ideas as well as the promotion of innovative firms, especially SMEs.

All of these measures are meant to promote the expansion of CESEES's domestic export industry into new (and potentially higher value-adding) fields of production and to result in a higher content of domestic value added in existing export production in order to further exploit the benefits of integration into European production networks. Certainly, the deep integration into the Single Market is a vital precondition for unlocking the full potential of the CESEE countries and making innovation and entrepreneurship thrive in the region. This fact is also stressed in the 2017 White Paper on competitiveness and inclusive growth by the EIB and the World Economic Forum, which stresses the importance of integrated markets for goods and services, sound labor markets and human capital as well as access to finance as key enablers of competitiveness.

References

- Benkovskis, K. and J. Wörz. 2016a.** Non-price competitiveness of exports from emerging countries. In: *Empirical Economics* 51(2). 707–735.
- Benkovskis, K. and J. Wörz. 2016b.** Non-price components of market share gains – evidence for EU countries. In: Belka M., E. Nowotny, P. Samecki and D. Ritzberger-Grünwald (eds.). *Boosting European competitiveness: The role of the CESEE countries*.
- Benkovskis, K. and J. Wörz. 2015.** “Made in China” – How does it affect our understanding of global market shares? ECB Working Paper 1787.
- Crespo Cuaresma, J., H. Oberhofer and G. A. Vincelette. 2014.** Institutional barriers and job creation in Central and Eastern Europe. In: *IZA Journal of European Labor Studies* 3(3). 1–19.
- European Bank for Reconstruction and Development (EBRD). 2016.** Transition for all: Equal opportunities in an unequal world. Transition Report 2016-17. www.ebrd.com/transition-report.
- European Investment Bank (EIB) and World Economic Forum. 2017.** White Paper: Beyond the Equity-Efficiency Trade-Off: Practical Ideas for Inclusive Growth and Competitiveness in Europe – The Europe Inclusive Growth and Competitiveness Lab. www.eib.org/infocentre/press/releases/all/2017/2017-071-world-economic-forum-eib-urge-eu-finance-ministers-to-make-inclusive-growth-top-priority.htm
- Karadeloglou, P. and K. Benkovskis. 2015.** Compendium on the diagnostic toolkit for competitiveness. ECB Occasional Paper 163.
- Ritzberger-Grünwald, D., M. Silgoner and K. Vondra. 2016.** New indicators of competitiveness – the Austrian perspective. In: Belka M., E. Nowotny, P. Samecki and D. Ritzberger-Grünwald (eds.). *Boosting European Competitiveness: The role of CESEE countries*.
- Silgoner, M., K. Steiner, J. Wörz and C. Schitter. 2015.** Fishing in the same pool: Export strengths and competitiveness of China and Central, Eastern and Southeastern Europe at the EU-15 market. In: *China Economic Review* 32. 68–83.
- World Economic Forum. 2016.** Global Competitiveness Report 2016–2017.

Fintechs and their emergence in banking services in CESEE

Caroline Stern ¹

Over the last years, the development of financial technology in the banking sector got a new twist with the emergence of numerous small start-ups called fintechs. Some of the new technologies will probably make specific areas of the banking business more efficient, while others may have the potential to disrupt the traditional banking sector. This paper presents the outcome of a stocktaking exercise and shows that most of the new financial technologies are still being used on a small scale. Given that the CESEE region is usually omitted in discussions of fintechs, this paper aims at closing this gap by giving an idea of which activities exist in this region with regard to financial technology. Focusing on three business areas – (1) financial services, (2) payments and (3) financing – this study finds that the level of adoption of new technologies varies across the CESEE countries. Also, a handful of countries seem to have a more active fintech scene in some areas (e.g. peer-to-peer lending) than many of their Western neighbors.

JEL classification: G21, G23

Keywords: fintech, nonbank financial institutions, banks

In the recent past, new financial services companies have received ample media coverage. Frequently referred to as fintechs, which is short for “financial technology,” such firms could change the banking world as we know it. The fintech scene is characterized by thousands of small start-ups but also well-established companies like Alibaba, Amazon and Google. The current dynamic in this field is reflected by venture capital investments in fintechs, which soared from USD 9 billion (2010) to USD 24.7 billion (2016) worldwide (KPMG, 2017). In the financial sector, these developments are expected to go hand in hand with enhanced efficiency as well as with a workforce reduction. Moreover, fintechs may foster financial inclusion, especially in emerging countries.

Traditional banks have already reacted to the rise of fintech by embarking on new digitalization projects. The European Commission (2017) defines fintechs as technology-enabled innovation in financial services, regardless of the nature or size of the provider of the service. A small body of research dealing with fintechs already exists in the U.S.A., the U.K. and China. There are hardly any pertinent studies focusing on Central, Eastern and Southeastern Europe (CESEE), however. Therefore, this paper is meant to fill this gap and to shed light on the CESEE region² with regard to fintechs. It is structured as follows: section 1 describes the current developments with regard to fintechs. Section 2 gives a more in-depth overview of different fintech business areas and their emergence in CESEE and section 3 concludes.

¹ Oesterreichische Nationalbank, Foreign Research Division, caroline.stern@oenb.at. The views expressed in this paper are exclusively those of the author and do not necessarily reflect those of the OeNB or the Eurosystem. The author would like to thank Peter Backé, Thomas Reininger, Julia Wörz (all OeNB) as well as two anonymous referees for helpful comments and valuable suggestions.

² This study includes the following countries: the CESEE EU Member States (Bulgaria, the Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Poland, Romania, Slovenia and Slovakia), the Western Balkan countries (Albania, Bosnia and Herzegovina and Serbia), Russia and Ukraine. However, data are not available for all the above-mentioned countries in all areas of this study.

1 Fintechs – current developments

Fintechs offer financial services which have to date usually been provided by traditional banks. In contrast to the latter, most fintechs do not hold a banking license. Yet, some fintechs which had risen to a critical size and started offering additional financial services had to be licensed as a bank/credit institution (e.g. Alibaba in China and N26 in Germany). Still, most fintechs are small start-ups that, by their own account, have a competitive advantage over traditional banks. After all, they offer new and unique innovative financial services, while at the same time being much more flexible in adapting to new market situations in comparison with big traditional banks. In fact, fintechs usually specialize in only one particular type of service and consider retail customers and/or small and medium-sized enterprises (SMEs) their main target groups. As the financial services on offer can be standardized, they may be provided at very low variable costs.

Unlike traditional banks, fintechs, which are usually not licensed as a bank, do not have to fulfill comprehensive regulatory requirements. However, this does not mean that these companies are not regulated at all.

One approach to fintech regulation is to use the existing regulatory framework and/or to amend it to capture fintech companies. For example, in the EU many fintechs fall under the Payment Services Directive (PSD 1 or Directive 2007/64/EU) and especially the new Payment Services Directive 2 (PSD 2 or Directive 2015/2366/EU), which was recently amended to integrate new business models (mainly fintechs). Still, the PSD 1 and PSD 2-based regulatory requirements for payment service institutions are far less comprehensive than the regulatory requirements for credit institutions laid down in the Capital Requirements Regulation (CRR or Regulation 575/2013/EU) and the Capital Requirements Directive (CRD or Directive 36/2013/EU) that are applicable in the EU. However, this also implies that credit institutions have more far-reaching competences than payment service institutions. The former are allowed to take deposits and perform term and risk transformations with deposits and other funds. In contrast, under PSD 1 and PSD 2 payment service institutions are not allowed to take deposits; they may grant loans to a very limited extent and have to immediately safeguard³ any funds they receive.

Following a different approach, some countries have introduced special regulatory requirements for fintechs (e.g. Switzerland and the U.K.) and/or regulatory sandboxes. The latter offer companies the possibility of experimenting on a limited scale with innovative financial services without having to comply with strict supervisory requirements. One may argue that in a sandbox environment companies as well as supervisors can learn how innovative financial services work. Usually, regulatory sandboxes are not limited to small start-ups only, but are also open to traditional big banks. The European Commission likewise considers the introduction of regulatory sandboxes. In its consultation paper on fintech, it poses the question whether regulatory sandboxes should be facilitated or created on an EU-wide basis (European Commission, 2017). Currently, supervisory sandboxes exist, for example, in the U.K., in Hong Kong, Singapore, Australia and Malaysia. How-

³ Safeguarding means that payment institutions have to (1) immediately deposit the funds to a credit institution or (2) invest them in secure, liquid and low-risk assets. In the first option, the funds have to be secured by an insurance company; in the second option, the funds are insured by the credit institution, as they are part of a deposit insurance scheme (see Article 10 Directive (EU) 2015/2366).

ever, when it comes to the details, each of these countries has its own interpretation of how a regulatory sandbox should work. To the author's knowledge, no CESEE country has yet introduced a supervisory sandbox for fintechs. Russia, by contrast, has seen the establishment of an Association for Financial Technology Development, which focuses in particular on the development of blockchain, i.e. the technology behind, for instance, bitcoin. Once fintech start-ups grow to a material size, they could pose a risk to financial stability. This may well call for stricter regulation.

One might assume that fintechs are mainly active in developed countries as fintech-related media coverage and research are concentrated on developed countries (e.g. the U.K. and U.S.A.). Yet, there are also remarkable developments in some emerging countries. As a case in point, China is the market with most peer-to-peer (P2P) lending platforms – namely around 2,300 as of February 2017, with a lending volume of CNY 2,000 billion according to wdzj.com.⁴ Kenya is a country where two-thirds of adults use their mobile phone to send and receive payments (Demirguc-Kunt et al., 2015). To this end, they employ services like M-Pesa⁵ that are provided by telecommunications companies. Consequently, this has sparked a lively discussion about whether fintechs could act as a catalyst promoting financial inclusion,⁶ above all in emerging countries.

Chart 1 illustrates the state of play of financial inclusion in terms of having a bank account, a debit card and a credit card in a number of advanced economies, CESEE economies and the two largest emerging market economies.⁷

One innovative feature of fintechs operating in payment services is that they very often offer payment services which do not require the ownership of a bank account. Instead, for many such services, it suffices to have a mobile phone, the ownership of which is already widespread in emerging countries (see also chart 4). Even though, according to Global Findex data, in most CESEE countries more than 60% have a bank account, bank account penetration is still much lower in many CESEE countries than in Western European countries (see chart 1). Ukraine, Bosnia and Herzegovina (around 50% have a bank account) as well as Albania (less than 40% have a bank account) exhibit the lowest levels. Chart 1 also shows that the ownership of a bank account does not necessarily result in the holding of a debit card. Moreover, credit cards are not popular in the CESEE region, where less than 40% own a credit card, and even less so in China, where only 20% have a credit card. Hence, the distribution and adoption of new innovative payment methods that do not depend on a bank account could boost financial inclusion significantly, albeit in one specific area only.

⁴ Wdzj.com is a private company operating in China that collects data on China's P2P lending industry.

⁵ M-Pesa is a service offered by Vodafone for transferring money with a mobile phone. It does not require a bank account, an Internet connection or a smartphone.

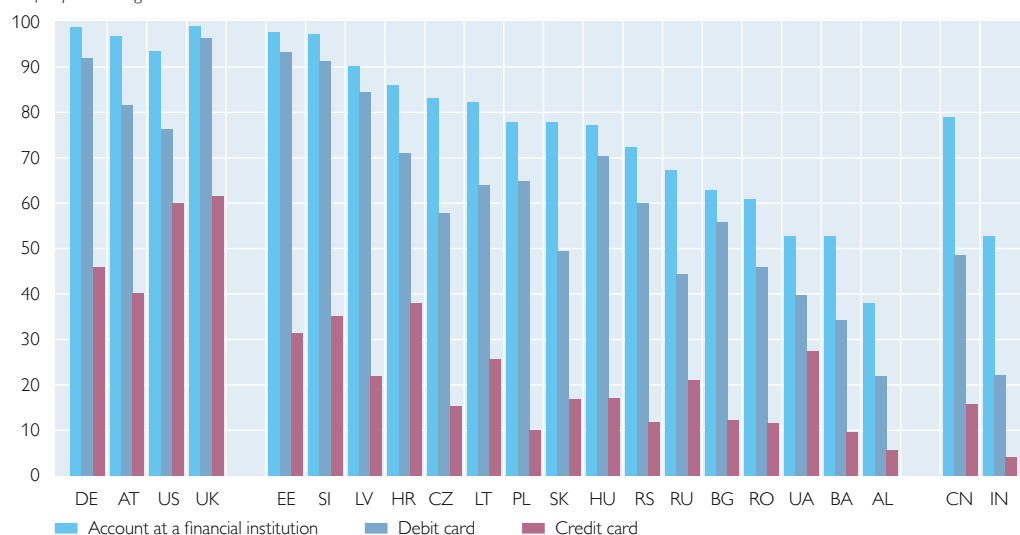
⁶ Financial inclusion is measured by the G-20 in three dimensions: (1) access to financial services, (2) usage of financial services and (3) the quality of the products and the service delivery (G-20, 2016). The indicators used in this study are mainly access and usage indicators.

⁷ The World Bank Global Findex database is used in this study, which is a comprehensive database on financial inclusion. Data stem from a survey carried out in partnership with Gallup World Poll. The database is based on interviews with about 150,000 nationally representative and randomly selected adults (aged 15 and over) in more than 140 countries (Demirguc-Kunt et al., 2015).

Chart 1

Use of traditional banking products varies significantly across CESEE countries¹

% of respondents aged 15+



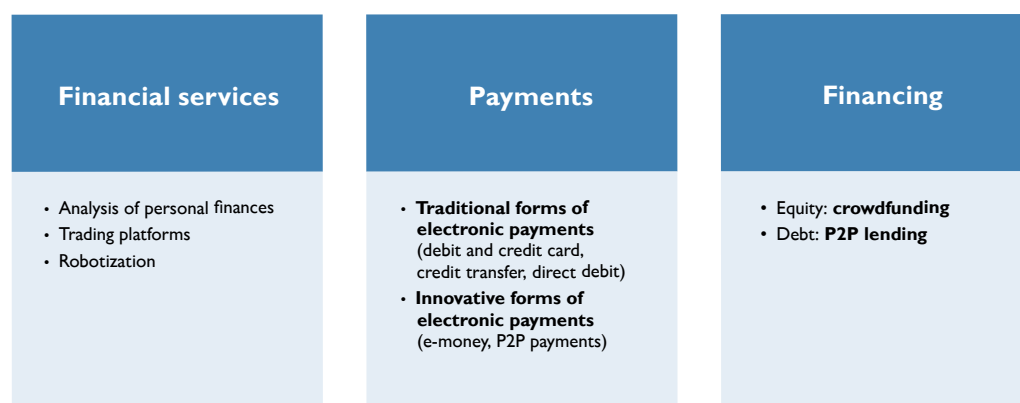
Source: Global Findex Database.

¹ Data as at 2014.

Business models of fintechs do not only rest on payment services, though. They are extensive, ranging from payment to financing as well as financial and investment advisory services. Moreover, fintechs explore new business areas on a continuous basis. For clarity, this paper centers merely on companies that offer banking services and excludes the following business areas: virtual currencies (e.g. bitcoin), blockchain (i.e. distributed ledger technology), foreign currency exchanges, companies that offer insurance products (insurtechs), fintechs which offer services related to regulatory requirements (regtechs) or corporations dealing with big data analysis and security (e.g. cyber security). Hence, in this study, fintech is broken down into three broad business areas: (1) financial services, (2) payments and (3) financing.

Chart 2

Fintech business areas



Source: Author's compilation.

All of these fintech offerings may trigger positive change like enhanced financial education or financial inclusion. The flip side is that some of these business models may pose a threat to financial stability if the start-ups reach a certain size and/or expose their customers to various risks they may not be fully aware of, e.g. risks related to cyber security.

2 Fintech business areas and their emergence in CESEE

This section explores opportunities and threats of different fintech business models and reports on fintech activities in financial services, payments and financing in the CESEE countries.

2.1 Financial services

Under financial services, we summarize businesses that offer Internet-based applications for (1) managing personal finances, (2) trading securities (trading platforms) and (3) automating financial services (robotization).

Fintechs providing tools that help individuals or companies manage their finances support customers for instance in managing their financial cash flows and in optimizing their spending structure. They also offer financial accounting solutions for SMEs, but also bigger companies. One example of this category is the app “Spendee,” developed by the Czech firm CLEEVIO, which connects the user’s mobile phone with the customer’s bank account and downloads transactions, sorting them into different categories. It helps the customer track their expenses by amount and by location. Moreover, users may define different wallets and share these with other people. Such analytical features are usually not offered by traditional banks, a number of which have, however, already introduced at least some analytical features – mostly in their online banking applications. Helping improve customers’ insights into their personal finances, income and expenses structure is likely to foster financial education.

Securities trading is traditionally associated with high ancillary expenses like transaction-based trading fees and relatively high deposit fees. For securities trading to be economically viable, large volumes are a prerequisite. Consequently, many people are excluded from securities trading. Yet, fintechs operating in this business area offer online trading platforms with very low or no deposit fees and very low transactions costs. Hence, lower trading volumes make economic sense, too. As a rule, the customer interacts solely with the trading platform via the Internet. Since these fintechs do not offer person-to-person or investment advisory services, their services cost less than those of traditional banks. On the one hand, online trading platforms lower the entry barriers for private customers and open new investment possibilities for them given the reduced transaction costs. On the other hand, not all private customers may be fully aware of the risk of suffering losses when investing in financial market securities. Moreover, money already transferred to the platform but not yet invested may not be covered by a deposit insurance scheme and may be lost should the platform become insolvent.

Finally, one large business area fintechs are active in is robotization. Services offered in this area are very often connected to the other two business areas discussed above. One example of a connection with personal finances is the automation of invoice payments, with a program automatically paying invoices on time. Another example is “SuperFaktura,” a Slovak program for automating the creation

of invoices. Robotization is also very popular when it comes to wealth management. So-called robo-advisors are programs that invest money automatically based on mathematical logarithms. These automated investments may be straightforward: e.g. the robo-advisor always makes deposits at the bank with the highest deposit rate up to the deposit insurance threshold amount. But they may also be much more complex. For instance, robo-advisors may base their portfolio investment strategy on several customer-related imputations and decide on the optimal investment strategy based on these imputations coupled with a mathematical algorithm. Therefore, robo-advisors have the potential to lower the search costs for personal customers, e.g. by finding the best rate and taking a decision on the best investment strategy. Furthermore, financial advice based on mathematical algorithms may be neutral compared with financial advice from humans. On the flip side, personal customers might not be fully aware of how their inputs translate into investment decisions by robo-advisors, which could lead to undesired investments (see also Philippon, 2016). Moreover, if large volumes are invested and investment decisions are based on the same mathematical algorithms, herding behavior could be amplified on financial markets. Last, but not least, customer service is being robotized. As a case in point, the Romanian lender Banca Transilvania has introduced “Livia” to communicate with customers on Facebook and Skype.

2.2 Payments

Fintechs providing innovative forms of electronic payments mostly do so via e-money, which is transferred via the Internet or via mobile phones. At the same time, some fintechs offer services (e.g. instant payments) that make “traditional” forms of electronic payments more efficient.

While the “traditional” forms of electronic payments (debit card, credit card, credit transfer and direct debit) are linked to a bank account, the more innovative solutions work without a bank account, but have another prerequisite: a mobile phone or Internet access. Only cash continues to be the payment method universally available without any technical prerequisites.

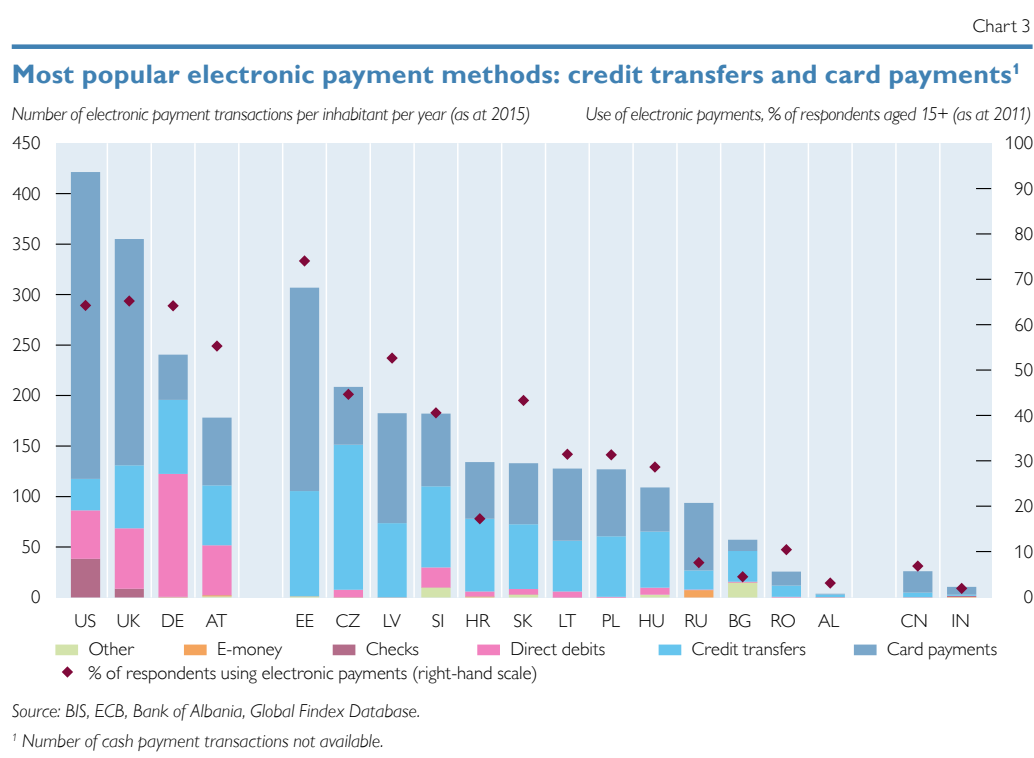
Companies offering innovative payment services have the potential for enhancing financial inclusion in many countries where bank accounts are not as common as in advanced economies. Moreover, many of these companies offer their services free of cost or at very low cost. Electronic payments may also help reduce corruption and the shadow economy because of their traceability (see Goel and Mehrotra, 2012). Yet some of these innovative payment methods may also be used for illegal purposes because of their anonymity.⁸

At least in the EU, the PSD 1 and the revised PSD 2 – the latter has to be transposed into national law by each Member State by January 13, 2018, at the latest – already regulate most fintech companies operating in the area of payment services. It is worth mentioning that innovative electronic payment services not linked to a bank account are offered not only by small fintech start-ups, but increasingly also by large well-established commercial banks. One example is the biggest bank in Croatia, Zagrebačka banka, which has been selected by EMEA

⁸ For virtual currencies, the EBA considers this a major risk (European Banking Authority, 2014), and the EU perceives this as a dominant feature of virtual currencies so that they have already been taken into account in the Anti-Money Laundering Directive (Directive (EU) 2015/849).

Finance as the most innovative bank in CESEE. Among other services, it offers m-buy, which is a mobile payment system in Croatia's biggest retail network (Deloitte, 2016).

Chart 3 illustrates the dominance of traditional, bank account-linked electronic payments and the still very limited use of the potential offered by fintech. The bars reflect the number of electronic transactions, broken down by payment method, per inhabitant and year (left-hand scale) and the diamonds indicate the share of the adult population that uses electronic payments (right-hand scale).



For the CESEE countries, the importance of electronic payments correlates positively with the possession of a bank account (as shown in chart 1). Electronic payments are most popular in Estonia, the Czech Republic, Latvia and Slovenia and least used in Albania, Romania and Bulgaria. Credit transfers and card payments (either by debit or by credit card) are the most common electronic payment methods, while checks are virtually nonexistent in Europe. At present, e-money is not used very widely. Looking to the right-hand scale of chart 3, we see that in most countries less than half of the respondents indicated that they have already made electronic payments. Estonian respondents are in the lead in this respect. According to the pattern evident in chart 3, the technology, while being in principle available in the CESEE countries, is only used by a small fraction of the population.

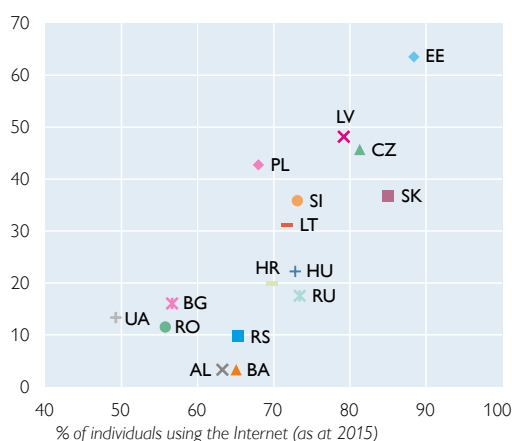
Chart 4 shows the relationship between the structural conditions and actual usage of the structures available for electronic payments. The left panel depicts Internet usage in general and usage of the Internet to pay bills. The right panel shows access to a mobile phone or the Internet at home and usage of an account to make transactions over a mobile phone.

Chart 4

Relationship between structural conditions and actual usage of electronic payments

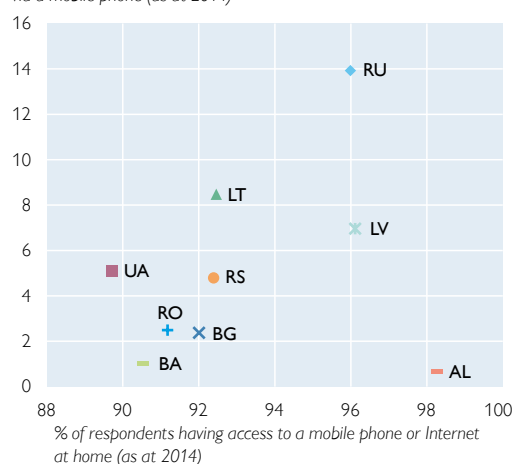
Countries with high Internet usage also have higher shares of Internet purchases

% of respondents using the Internet to pay for purchases (as at 2014)



Payments with mobile phones are still very often performed via an account at a bank/financial institution

% of respondents using an account to make transactions via a mobile phone (as at 2014)



Source: International Telecommunication Union, Global Findex Database.

The left panel shows clearly that the higher the share of Internet users in general, the higher the share of individuals using the Internet to pay bills or buy things. At the same time, mobile payments are not yet widespread. The data refer to mobile payments that are performed using an account at a bank or other financial institution. The Global Findex Database also gives us information on the usage of mobile phones to pay bills where no account is involved. Note, however, that the data stem from the year 2011 and that the fraction of respondents answering that they used their mobile phone to pay bills is below 3% in almost all CESEE countries. The only exception is Albania, where one-fifth of respondents answered in the affirmative. It is worth mentioning that M-Pesa has been active also in Albania (since 2015) and in Romania (since 2014).

To sum up, there is a group of countries in the CESEE region where electronic payments are widely used, namely Estonia, the Czech Republic, Latvia and Slovenia. Mobile payments are exceptionally popular in Albania. Notably, in many Southeastern European countries electronic payments play only a minor role.

2.3 Financing

Fintechs offer financing in the form of equity and/or debt to individuals and companies (mostly SMEs). Usually, financing is provided via a platform matching investors and lenders. In most cases, the fintech company does not lend/finance on its own and does not take on the risk of the loan or investment. Financing activities may be divided into equity/equity-like⁹ financing (crowdfunding) and debt financing (P2P lending). Such business models are also often referred to as marketplace lending because funds are provided by peers or the crowd and not by a single institution.

⁹ Equity-like means that some crowdfunding platforms offer participation via deeply subordinated debt or convertible instruments instead of genuine participation in equity.

Crowdfunding can be broken down further into profit and nonprofit-oriented forms, as the money raised could either be (1) a donation or (2) an investment. In the latter case, the funding might involve interest payments. Repayment (and, if applicable, interest payments) may take the form of a payment in kind (e.g. bread when a bakery is financed). Profit-oriented crowdfunding platforms finance virtually only SMEs.

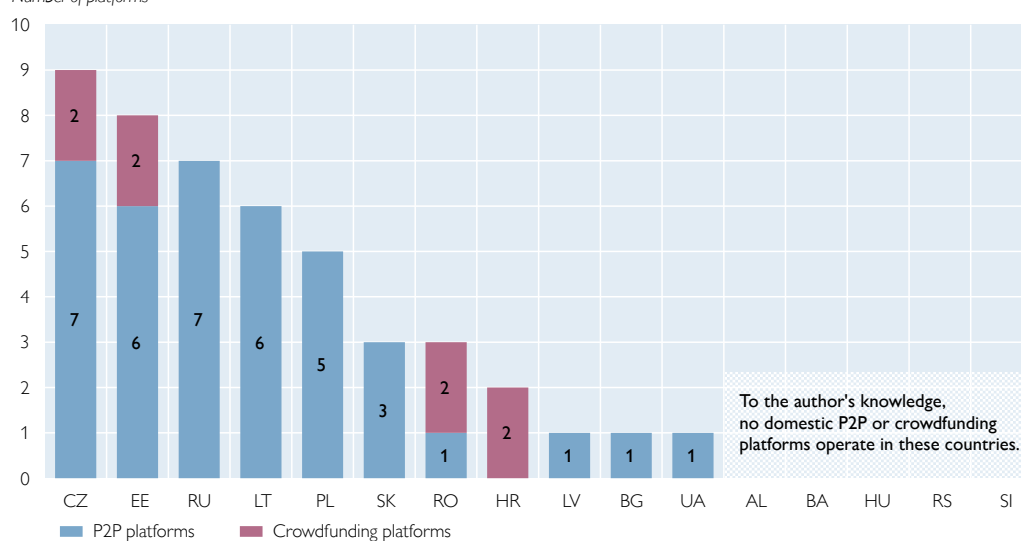
By contrast, the majority of P2P lending platforms tend to be specialized in consumer loans.

In the CESEE region, P2P lending is much more popular than crowdfunding (see chart 5). There is a group of countries – the Czech Republic, Estonia, Russia, Lithuania and Poland – where several (domestic) P2P lending platforms are active. Some of them also operate in more than one CESEE country (see the list in the annex for details). In addition to the number of platforms shown in chart 5, foreign platforms (crowdfunding and P2P lending) are active in several CESEE countries. Cases in point are Indiegogo and Kickstarter. No evidence for activities of any (domestic or foreign) platforms was found in Albania, Bosnia and Herzegovina, Hungary, Serbia and Slovenia.

Chart 5

Several funding platforms are already active in some CESEE countries¹

Number of platforms



Source: Author's compilation.

¹ This chart only shows domestically established platforms that, to the author's knowledge, had active users at the time this study was compiled. Foreign platforms operating in some of the countries are excluded. For a list of all platforms, see the annex.

In the CESEE region, most P2P lending platforms intermediate their loans in local currency, but one platform extends loans in foreign currency, e.g. Swiss francs. According to our knowledge, investors in P2P lending platforms in this region could be natural and legal persons or specialized companies that establish trusts/funds and invest exclusively in loans provided via P2P lending platforms. On top of the variations already mentioned, the business model of P2P lending platforms may be very different (see also charts 1 to 3 in the box).

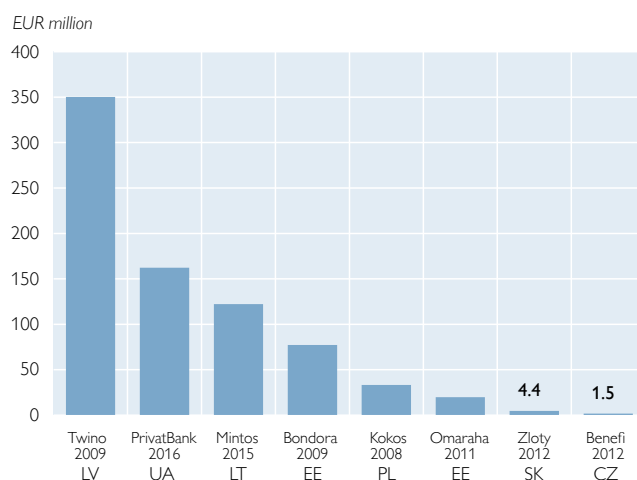
The Czech Republic, Estonia and Lithuania have already started to regulate P2P lending platforms. In the Czech Republic, they are supervised as small payment institutions and are hence restricted in terms of size (the average annual total amount of payment transactions must not exceed EUR 3 million per month) and geographic reach (they are only allowed to provide their services in the Czech Republic). In Estonia, the Creditors and Credit Intermediaries Act was introduced in March 2015. This act also covers activities of P2P lenders and makes it necessary for them to be licensed as credit intermediaries or creditors. Lithuania, in turn, considering P2P lenders to be public consumer lenders or intermediaries, has tightened regulatory requirements as of February 2016. Note, however, that new regulations were also introduced to regulate other nonbank lenders (e.g. payday lenders), which had mushroomed in the Czech Republic, Estonia and Lithuania. In Lithuania, for example, the lending volume of nonbank lenders well exceeds that of P2P lenders (EUR 225 million vs. EUR 4.6 million as of July 2016) (Lietuvos bankas, 2016)¹⁰.

Chart 6 compares the gross lending volume of P2P lending platforms since their start of business.

Chart 6

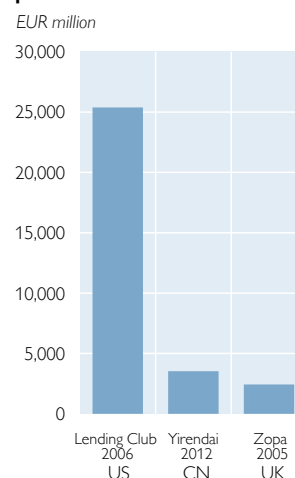
CESEE P2P lenders are still very small in comparison with international market leaders

CESEE P2P lending platforms



Source: Company websites.

Leading international P2P lending platforms



It does not come as a surprise that the absolute volumes of the biggest P2P lenders in CESEE countries are much smaller than those recorded by the leading platforms on a global level. However, three CESEE platforms have already achieved a lending volume of over EUR 100 million, namely Twino, PrivatBank and Mintos. The other platforms operating in CESEE pale in comparison with Twino, which boasts a lending volume of EUR 350 million. It is interesting to note that the companies Twino and Mintos work together with (several) loan originators. Also noteworthy is that PrivatBank, which was nationalized in December 2016, has stopped its P2P

¹⁰ Lietuvos bankas does not seem to consider the company Mintos to be a P2P lender.

lending activities. The National Bank of Ukraine has announced that it would stop PrivatBank's P2P lending activities and bring the P2P loans back onto the balance sheet of PrivatBank.

Comparing the lending volumes of P2P platforms with the amount of total outstanding loans in the respective countries does not make much sense for two reasons. First, P2P lenders usually only disclose the overall amount they have lent over the lifetime of a given platform and not the currently outstanding loan volume. Second, some P2P lenders are active in more than one country (unless restricted by regulatory requirements) and do not provide information on the lending volume in each country. One approach to get an idea of the relevance of P2P lending platforms in the consumer loan market is to compare the average yearly new consumer loan volumes since the establishment of the respective P2P lending platforms with the lending volumes indicated by the P2P platforms. This calculation results in a maximum amount as P2P lenders are also active in SME lending and some of them do business in more than one country. Accordingly, P2P lending platforms make up one-quarter of average new consumer loans in Latvia (Mintos) and Lithuania (Twino). These figures clearly have an upward bias given that these platforms, which are incorporated in a small country, are also active in several other larger markets (Mintos: e.g. in the Czech Republic and Poland; Twino: in the Czech Republic, Russia and Poland). In contrast, the lending volumes of Kokos, the biggest P2P lender in Poland, account for only 0.02% of average yearly new consumer loans. But also in smaller countries of the region (the Czech Republic and Slovakia), loans by P2P lenders¹¹ amount to no more than 0.01% of average yearly new consumer loans. Finally, we can compare these data with lending volumes in the United Kingdom. The U.K. has a P2P Finance Association, which publishes lending volumes for almost the entire P2P lending industry. In the U.K., P2P lenders provided GBP 3 billion in 2016, which equals 10% of new consumer loans extended in 2016. This figure, too, is biased upward as many U.K.-based P2P lenders likewise do business in other countries and extend also loans other than consumer loans.

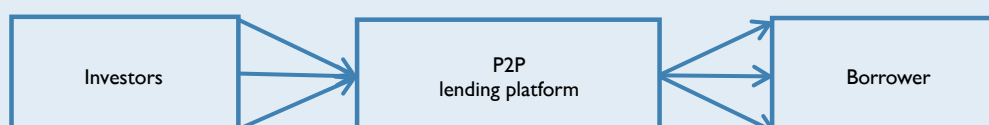
Box

Business models of P2P lending platforms in CESEE

Business models of P2P lending platforms may vary greatly. We identified the following three types in the CESEE countries, described in more detail in charts 1 to 4¹ below: (1) classical P2P lending, (2) P2P lending platform with one or more credit originators and P2P lending platforms as a subsidiary of a "traditional bank" and (3) crowdvouching.

Chart 1

Classical P2P lending business model



¹ Arrows in charts 1 to 3 indicate the direction of the cash flow. In chart 4, arrows may refer to the cash flow, guarantee or fee payments as indicated next to each arrow.

¹¹ As no comprehensive data on the whole P2P market are available in these countries, we calculated the figures using the P2P lending platforms Benefi for the Czech Republic and Zloty for Slovakia. Arrows in charts 7 to 9 indicate the direction of the cash flow. In chart 10, arrows may refer to the cash flow, guarantee or fee payments as indicated next to each arrow.

Investors (i.e. natural or legal persons) invest in loans to borrowers that have posted a request for a loan via the P2P lending platform. In this case, the role of the P2P lending platform only consists in bringing together investors and borrowers. The platform usually earns fees from the borrower and/or investor.

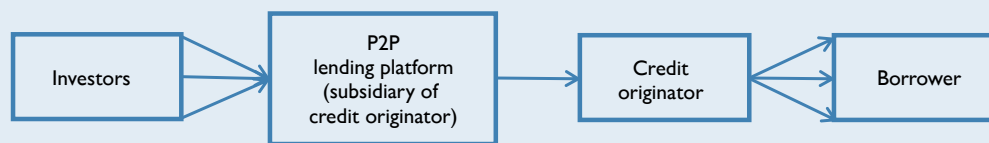
Many P2P lending platforms use business models which are variations of this “classical” P2P lending model, as is shown in charts 2 to 4.

The first variation of the “classical” P2P lending business model is that borrowers do not

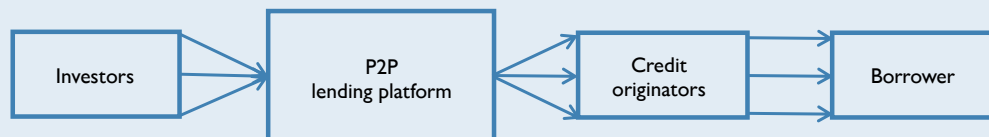
Chart 2

P2P lending platforms with one or many credit originators

P2P lending platform with one credit originator



P2P lending platform with many credit originators



on their own initiative request credit via the P2P lending platform, but rather a credit originator grants the loan. The P2P lending platform may work together with one credit originator that could also be the parent company, or with many credit originators that collaborate with the P2P lending platform on a contractual basis. This business model works as follows: The credit originator granting a loan also finances the loan, and the credit risk is first borne by the originator. In a second step, the P2P lending platform offers these loans on the Internet. Once an investor decides to invest in a loan, the said loan is transferred to the investor via a (partial) assignment. The transfer of loans to an investor could also be organized via securitization. In many cases, the risk of the loan is also transferred to the investor. Consequently, the loan is derecognized from the balance sheet of the credit originator. Finally, the cash proceedings of the sale of the loan are forwarded to the credit originator. Thus refunded, the credit originator may use the funds to grant new loans.

Chart 3

Traditional bank with P2P lending platform as subsidiary

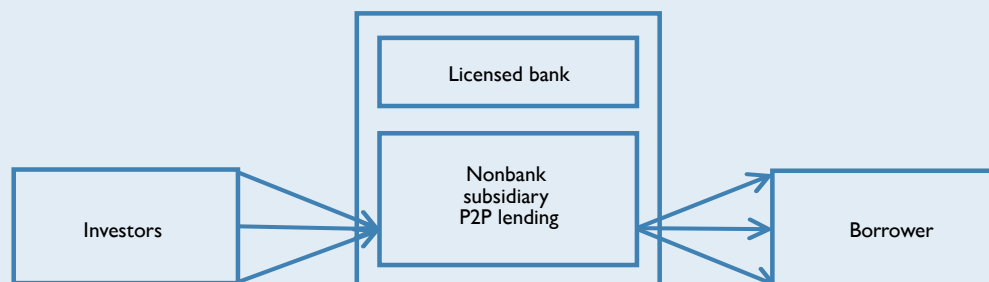
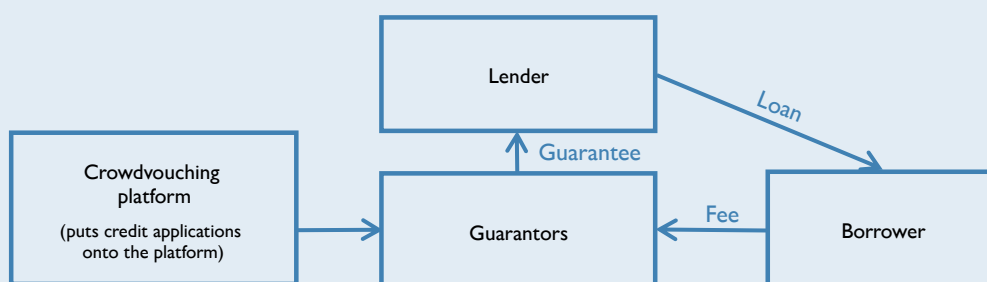


Chart 3 shows another variation of this business model where a licensed bank establishes a P2P lending subsidiary that is not a bank. This platform then acts like a “classical” P2P lending platform. The parent bank benefits from this in that it is able to grant loans and earn fees without permanently taking the risk of the loan on its own balance sheet, which eventually relieves regulatory capital pressure. However, this business model was observed only once in the CESEE region – at PrivatBank in Ukraine. With PrivatBank having been nationalized, the National Bank of Ukraine announced to stop P2P lending at PrivatBank.

Crowdvouching, the final variation of P2P lending, as illustrated in chart 4, does not involve

Chart 4

Crowdvouching



funding by peers. First, the crowdvouching platform puts the loan application on the platform website. Potential guarantors receive information (e.g. photo ID and credit history) from each loan applicant on their mobile phone app. With a mere swipe, they may then decide if they grant a guarantee to a particular applicant or not. For a loan application to be accepted by the crowdvouching platform, many positive decisions by potential guarantors are necessary. Upon acceptance of the application, the lender (which could also be a bank) grants the loan and transfers the agreed amount of funds to the borrower. The potential guarantors become actual guarantors for this loan and receive fees from the borrower. If the borrower defaults on the loan, the guarantee takes effect and the guarantors have to pay the open balance of the loan to the lender. This business model is offered by a Russian platform called Surety. The company is still in the start-up phase but already operates legal entities in Russia, Kazakhstan and the U.S.A.

P2P lending and crowdfunding can lead to positive effects but also involves a number of risks. On the positive side, P2P lending is likely to enhance access to finance for retail and SME customers, catering to an otherwise unattended segment of credit demand. A study on the German P2P lending market found that P2P lenders indeed serve a slice of the consumer credit market which is neglected by banks, namely high-risk and small-sized loans (de Roure et al., 2016). Hence, crowdfunding may increase access to equity financing for SMEs, providing more risk capital for SMEs, especially start-ups.

On the downside, there are also a number of risks associated with marketplace lenders. The main feature of P2P lending is that the risk of the credit is not borne by the platform itself, but by the investors. This is very different from the traditional banking business model where the bank takes deposits and performs risk and term transformations. In this case, the risk of the depositor is not directly dependent on the risk of the loan a bank grants to a borrower. On the other hand, when money is deposited at a bank, the depositor cannot influence in which assets (i.e. loans,

securities) the bank invests the money. This stands in contrast to P2P lending as well as crowdfunding: there the investor decides who or what project will be financed.

When it comes to P2P lending, the investor is not protected by a deposit insurance scheme. Quite the contrary, the investor usually bears the full credit risk and is subject to asymmetrical information because the lender is fully dependent on the information provided by the borrower and normally does not have the possibility of performing any additional due diligence. Moreover, investors will face undiversified credit risk if they do not actively reduce it by financing different loans with different risk profiles. As mentioned above, most P2P lenders grant unsecured consumer loans, which usually suffer from high default rates. Such losses will have to be borne by the investors, i.e. natural or legal persons. A study performed with data of Lending Club (the biggest P2P lending platform in the U.S.A.) shows that the higher interest rates charged on high-risk borrowers are not enough to compensate for the higher probability of default (Emekter et al., 2015). In addition, in most countries P2P lenders are not subject to any special regulatory requirements beyond the normal legal requirements for doing business.

When it comes to crowdfunding, investors are susceptible to special risks not yet mentioned above. Crowdfunding platforms enable investors to invest in SMEs, mostly start-ups. The participating interest takes the form of equity or equity-like investments with all the risk usually inherent in an equity investment for investors. However, it is safe to assume that investments in start-ups bear a higher risk of default than equity investments in well-established companies. Hence, it is of utmost importance with respect to crowdfunding that investors are aware of the high-risk nature of this type of investment and of the fact that they stand to lose their entire investment.

3 Summary and concluding remarks

In recent years, the development of financial technology in the banking sector got a new twist with the emergence of numerous small start-ups called fintechs. Chances are that some of these new technologies will make parts of the banking business more efficient, while fintech companies may have the potential to disrupt the traditional banking sector if they manage to grow to a certain size. Even though most of the new financial technologies are still being used only on a small scale, traditional banks have taken note of this development and have started to either cooperate with fintechs or create innovative financial products on their own.

Fintechs are usually specialized, i.e. they tend to offer only one financial product, e.g. payments. In contrast, traditional banks normally offer the full range of financial products – from payments to loans and financial advisory services. Moreover, fintechs mostly do not provide services that require a banking license. Regulators are, however, already paying attention to fintechs by introducing special legislation or regulatory sandboxes to better understand these new technologies.

This study only revolves around fintechs that are active in three business areas: (1) financial services (analysis of personal finances, trading platforms and robotization), (2) payments (traditional forms of electronic payments, i.e. debit and credit card, credit transfer and direct debits, and innovative forms of electronic payments, i.e. e-money, P2P payments) and (3) financing, i.e. crowdfunding and P2P lending, which is also called marketplace lending.

Financial services is a business area where many fintech start-ups are operating and where traditional banks have already started to cooperate with fintechs or to develop their own innovative financial services. For the CESEE region we find some activity in this area. However, not enough meaningful data are available to give a complete picture of this area.

With regard to payments, we differentiate between traditional and innovative payment methods. The main innovative feature of e-money (payments that are often effected via a mobile phone or the Internet) is that the customer does not necessarily need a bank account to make payments. With bank account penetration still low in some CESEE countries, the adoption of mobile phone payments or payment via the Internet might boost financial inclusion in the region. As a rule of thumb, traditional payment methods are available from traditional banks, whereas innovative payment methods are offered mostly by fintechs. There are, however, exceptions to this rule: in some CESEE countries (e.g. Croatia) traditional banks have incubated the most innovative forms of payment. Yet, data from the Global Findex Survey show that mobile payments are not yet widespread in the CESEE region or in other European countries.

The fintech business area of financing is quite vibrant in the CESEE region, with P2P lending being far more common than crowdfunding. In the Czech Republic, Estonia, Russia, Lithuania and Poland, a number of platforms are active. The business models of P2P lenders in the CESEE region may differ significantly from the “classical” P2P platforms. The share of loans granted by P2P lending platforms and companies financed via crowdfunding is still very small in comparison with the total consumer loan market. P2P lending may enhance access to finance for retail and SME customers, catering to an otherwise unattended segment of loan demand. On the other hand, P2P lending entails a number of risks. First, the total credit risk is borne by the investor and remains undiversified as long as the investor does not actively reduce it by financing different loans with different risk profiles. Moreover, the investor is subject to asymmetrical information because the lender is fully dependent on the information provided by the borrower and normally has to make do with the due diligence provided by the platform.

In light of this, especially P2P lending could pose significant risks to customers and to financial stability if it reaches critical mass. In some countries (namely the Czech Republic, Estonia and Lithuania), regulators have already started to introduce special regulatory requirements for these platforms (usually classified as “small payment service providers”). With regard to P2P lending, the following recommendations might be worth considering: enhancing transparency and reducing asymmetrical information between the borrower and the lender by requiring the disclosure of certain figures (e.g. lending volume or loans defaulted) and details with regard to the P2P lending platform (e.g. disclosure of how the ratings are calculated). Moreover, the most recent financial crisis has shown that structures where the originator/intermediary of a loan does not bear at least part of the credit risk lead to undesired moral hazard effects. Therefore, a requirement that the originator or P2P lending platform has to retain at least part of the credit risk would probably reduce this moral hazard effect.

To sum up, the topic of fintechs is currently being discussed around the globe, but to date little attention has been paid to the CESEE region. This paper is meant to close this gap by taking stock of fintech activities in CESEE. Adoption of new

technology is very heterogeneous across the CESEE countries. Interestingly, some of them seem to have a more active fintech scene in some areas (e.g. P2P lending) than many of their western neighbors.

References

- Deloitte. 2016.** FinTech in CEE. Charting the course for innovation in financial services technology. December. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/central-europe/ce-fintech-in-cee-region-2016.pdf> (retrieved on July 3, 2017).
- Demirguc-Kunt, A., L. Klapper, D. Singer and P. V. Oudheusden. 2015.** The Global Index Database 2014. Measuring Financial Inclusion around the World. Policy Research Working Paper 7255.
- De Roure, C., L. Pelizzon and P. Tasca. 2016.** How does P2P lending fit into the consumer credit market? Deutsche Bundesbank. Discussion Paper 30/2016.
- Emekter R., Y. Tu, B. Jirasakuldech and M. Lu. 2015.** Evaluation Credit Risk and Loan Performance in Online Peer-to-Peer (P2P) Lending. In: *Applied Economics* 47(1). 54–70.
- European Banking Authority. 2014.** EBA opinion on “virtual currencies.” July 2014.
- European Commission. 2017.** Consultation Document. FinTech: A more competitive and innovative European financial sector. https://ec.europa.eu/info/sites/info/files/2017-fintech-consultation-document_en_0.pdf (retrieved on July 3, 2017).
- European Union. 2007.** Directive 2007/64/EU of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market. <http://eur-lex.europa.eu/legal-content/DE/TXT/?qid=1493722102958&uri=CELEX:32007L0064> (retrieved on July 3, 2017).
- European Union. 2013a.** Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms. <http://eur-lex.europa.eu/legal-content/DE/TXT/?qid=1493722428375&uri=CELEX:32013L0036> (retrieved on July 3, 2017).
- European Union. 2013b.** Regulation 575/2013/EU of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms. <http://eur-lex.europa.eu/legal-content/DE/TXT/?qid=1493722595369&uri=CELEX:32013R0575> (retrieved on July 3, 2017).
- European Union. 2015.** Directive 2015/2366/EU of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015L2366&from=EN> (retrieved on July 3, 2017).
- G-20. 2016.** G20 Financial Inclusion Indicators. https://www.gpfi.org/sites/default/files/Indicators%20note_formatted.pdf (retrieved on July 3, 2017).
- Goel, R. K. and A. N. Mehrotra. 2012.** Financial Payment Instruments and Corruption. In: *Applied Financial Economics* 22(11). 877–886.
- KPMG. 2017.** The Pulse of FinTech Q4 2016. Global analysis of investments in FinTech. February. <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/02/pulse-of-fintech-q4-2016.pdf> (retrieved on July 3, 2017).
- Lietuvos bankas. 2016.** Changes in payday loan market – more responsible lending, fewer indebted. Press release dated September 6.
- Philippon, T. 2016.** The FinTech Opportunity. NBER Working Paper 22476. August.

Annex

Table A1

Crowdfunding and P2P lending in CESEE countries

Name	Business model	Country	Also operating in	Website
KLEAR	P2P	BG		https://www.klearlending.com
Zonky	P2P	CZ		https://zonky.cz
Benefi	P2P	CZ		https://www.benefi.cz
Bankerat	P2P	CZ		https://www.bankerat.cz
Fin X	P2P	CZ		https://www.finx.cz
Loanis	P2P	CZ		http://www.loanis.cz
Pujcmefirme	P2B	CZ		https://www.pujcmefirme.cz
FinGOOD	P2B	CZ		http://www.fingood.cz
Hithit.com	Crowdfunding	CZ	SI	https://www.hithit.com/cs/home
Startovac.cz	Crowdfunding	CZ		https://www.startovac.cz
Bondora	P2P	EE		https://www.bondora.com
MoneyZen	P2P	EE		https://www.moneyzen.eu
EstateGuru	P2P	EE		https://estateguru.co
Monestro	P2P	EE		https://www.monestro.com
Hooandja.ee	Crowdfunding	EE		http://www.hooandja.ee
Fundwise.me	Crowdfunding	EE		https://fundwise.me
Vivendor	P2P	EE		https://www.vivendor.com
Omaraha	P2P	EE	SK	https://omaraha.ee
Croinvest	Crowdfunding	HR		http://croinvest.eu
Croenergy	Crowdfunding	HR		http://croenergy.eu
Mintos	P2P	LT	CZ, EE, PL, LV	https://www.mintos.com
Savy	P2P	LT		https://gosavy.com
FinBee	P2P	LT		https://www.finbee.lt/en/
Paskolu Klubas	P2P	LT		https://www.paskoluklubas.lt
Manu	P2P	LT		https://www.manu.lt
OK.lt	P2P	LT		https://ok.lt
Twino	P2P	LV	CZ, RU, PL	https://www.twino.eu
Kokos	P2P	PL		https://kokos.pl
Finansowo.pl	P2P	PL		https://www.finansowo.pl
Sekrata	P2P	PL		https://www.sekrata.pl
Zakramini	P2P	PL		https://zakramini.pl
Apple Credit	P2P	PL		https://applecredit.pl
FriendCredit	P2P	RO		http://www.friendcredit.ro/FriendsCredit
Sprijina	Crowdfunding	RO		https://www.sprijina.ro/
Crestem Idei	Crowdfunding	RO		http://crestemidei.ro
vdolg	P2P	RU		https://vdolg.ru
BezBanka	P2P	RU		https://bezbanka.ru
fingooroo	P2P	RU		https://fingooroo.ru
Loanberry	P2P	RU		https://www.loanberry.ru
Fundico	P2P	RU		http://www.fundico.ru
Blackmoon	P2P	RU		https://blackmoonfg.com
Surety	P2P	RU		https://surety.com/en
Plan B	P2P	SK		https://planb.sk
Zinc Euro	P2P	SK		https://www.zinceuro.sk/vsetko-o-zinc/
Zlty	P2P	SK	CZ	https://www.zltymelon.sk
PrivatBank	P2P	UA		https://privatbank.ua

Source: Author's compilation.

Note: No P2P lending platforms in AL, BA, HU, MK, RS, SI.

Comparing market power at home and abroad: evidence from Austrian banks and their subsidiaries in CESEE

In this study, we examine markups of Austrian banks and their subsidiaries in Central, Eastern and Southeastern Europe (CESEE) on an unconsolidated level. Markups are evaluated by means of the Lerner index by simultaneously estimating a price and a cost function derived from oligopoly theory. For that purpose, we use a novel fixed effects seemingly unrelated regression approach and a unique supervisory dataset covering around 800 banks over the period from the first quarter of 2008 to the second quarter of 2016. We find evidence for positive markups for Austrian subsidiaries in CESEE. These markups are even higher than the markups of Austrian parent banks, which emphasizes the importance of the CESEE markets for the overall profitability of the Austrian banking sector. Looking at the determinants of markups for Austrian subsidiaries in CESEE, we find that higher Lerner indices are associated with better capitalization, higher loan loss provisions and, more generally, greater size – the latter effect is especially true for banks in more developed host countries. Also, there is a negative correlation between the Lerner indices of subsidiaries and parent banks. This implies that opportunity costs in the home country play a role in determining market power in the host country.

Martin Feldkircher,
Michael Sigmund¹

JEL classification: D40, G21, L10, C30

Keywords: Lerner index, banking sector, market power, CESEE

Banking in CESEE economies has been very dynamic over the last three decades. In the early and mid-1990s, banks transformed from operating under a socialist system to operating under a market economy (Barisitz and Gardó, 2009). It took several steps to accomplish the transformation from a monobank system, where one single bank had more or less been responsible for central banking as well as commercial banking operations. A first wave of reforms included extensive liberalization measures and initial limited restructuring and tightening efforts, but was not accompanied by sufficient institutional changes to safeguard the transitional process (Barisitz and Gardó, 2009). A second wave of reforms focused on in-depth privatization to bring in missing know-how, technology and capital. As a consequence and with the turn of the millennium, mostly Western European investors acquired the lion's share of CESEE banking sectors. Austrian banks were at the forefront of the expansion into CESEE markets. The motives to expand were manifold, including market size, favorable political developments and historical connections.² During this expansion phase, catching up-driven credit growth could fully unfold under the new foreign-owned bank presence to further underpin economic growth in the region. Austrian banks also profited strongly from these developments, with their subsidiaries in

¹ Oesterreichische Nationalbank, Foreign Research Division, martin.feldkircher@oenb.at and michael.sigmund@oenb.at. The views expressed in this paper are exclusively those of the authors and do not necessarily reflect those of the OeNB or the Eurosystem. The authors would like to thank Peter Backé, Sara Basara, Markus Eller, Gerald Krenn and two anonymous referees for helpful comments and valuable suggestions.

² More generally and based on German bank data, Buch (2000) shows that foreign (banking) activities are positively related to demand conditions on the local market, foreign activities of home-based firms, and the presence of financial centers.

CESEE contributing to overall profitability in the Austrian banking sector. With the outbreak of the global financial crisis and in line with global trends, credit growth came to an abrupt halt and operating income of Austrian subsidiaries under pressure. At the height of the crisis, the Vienna Initiative was founded to foster cooperation among international financial institutions, European agencies and governments and the largest Western European banks in the region. The aim was to sustain parent bank funding and hence maintain overall stability of the financial sector in the region.³

In this study, we provide an up-to-date assessment of markups of Austrian banks, drawing on a unique supervisory dataset. The data allow us to compare the market power of subsidiaries in CESEE and their parent banks in Austria, which may shed light on banks' motives for investing abroad. Since markups during the expansionary phase were generally high in the region, we concentrate on the more interesting period, namely the aftermath of the crisis, which is characterized by diverging profitability.⁴ Our focus is on juxtaposing the markups of Austrian subsidiaries in CESEE and those of their Austrian parent banks, a topic that has so far not been systematically investigated. Nevertheless, there is a related strand of the literature that assesses the impact of foreign-owned banks on the host country's banking sector and macroeconomy. In a nutshell, the literature summarized in Cull et al. (2017) reveals evidence that the presence of foreign-owned banks in developing economies enhances efficiency by exerting pressure on locally-owned banks' cost structure. The literature focusing on banks in CESEE seems inconclusive, though: while Poghosyan and Poghosyan (2010) find that foreign ownership enhances competition and efficiency in CESEE, Green et al. (2004) do not find a significant effect of foreign ownership on banks' total costs for the period from 1995 to 1999. A more detailed picture is provided in Jeon et al. (2011). Their analysis reveals that the efficiency-enhancing effect of foreign-owned banks depends crucially on the mode of entry into local markets: the positive effect of foreign bank presence on competition in the banking sector is significantly stronger with greenfield investments (which increases the number of banks in the financial system) than with mergers and acquisitions. Havrylchyk and Jurzyk (2011) examine the role the mode of entry plays for foreign-owned banks in CESEE. They find that greenfield banks show higher profitability due to greater cost efficiency compared with local banks. This is not true for takeover banks where the foreign bank inherits the cost structure and staff from the original bank. Results in Bonin et al. (2005) could be summarized in a similar fashion, revealing that foreign-owned banks in CESEE are more cost efficient compared with state-owned banks, especially if the foreign owner pursues a strategic investment purpose. There is also a link between the presence of foreign-owned banks and banking sector stability. A broad consensus seems to have formed that in the presence of a local (i.e., host country) shock, foreign-owned banks can act as a stabilizer for the host economy (Cull et al., 2017; Havrylchyk and Jurzyk, 2011). This stabilizing function works through subsidiaries' access to liquidity and credit from parent banks. By contrast, global shocks – such as the outbreak of the global financial crisis – may be imported through foreign banks

³ For more details, see www.vienna-initiative.com.

⁴ In what follows we use the terms “markups” and “profitability” interchangeably. This can be justified either by considering the construction of the Lerner index or by correlating the index with a well-known profitability measure. For our dataset, we find a positive correlation of the index, with a return on assets and a return on assets before taxes of about 0.6.

and may materialize through reduced credit lending. Regarding this latter aspect, there is a branch of the literature examining domestic firms' access to credit in the presence of foreign-owned banks. It could be argued that foreign-owned banks are at an informational disadvantage relative to their local peers in the host country since the latter can draw on soft information that includes knowledge of borrowers' intangible traits (Cull et al., 2017). This implies that foreign-owned banks are associated with reduced access to credit for informationally opaque firms, as evidenced in Detragiache et al. (2008) and Gormley (2014). For CESEE economies, though, the relationship seems more complex, and empirical evidence indicates that foreign banks pursue different strategies within the same host countries (Cull et al., 2017). finan

In this paper, we examine the degree of competition of Austrian subsidiaries in CESEE by using the Lerner index (Lerner, 1934), which is a widely accepted competition measure and follows standard microeconomic theory. More precisely, it identifies the extent to which the price charged by a firm or bank in an industry diverges from the price that would emerge under perfect competition. The Lerner index is defined by the difference of actual prices and marginal cost over prices. It measures competition for each bank in its local market without explicitly considering all its competitors. As the Lerner index measures relative profitability, it is possible to compare the Lerner indices of different subsidiaries to the home-based parent. The home-based banking activity of the parent therefore can be seen as the alternative investment opportunity. In this sense, it is an ideal concept to monitor the investment decision of a firm or bank to enter new markets.

The empirical literature on Lerner indices is abundant. For example, Gunter et al. (2013) analyze determinants of the net interest rate margin (NIM) for Austrian banks over the period 1998 to 2013. They find that among other factors, the Lerner index is significantly (and positively) related to the NIM. Turk-Ariss (2010) examines the relationship between market power, bank efficiency and stability, estimating Lerner indices for a broad sample of 821 banks in 60 developing countries. Her results support the competition fragility view, which postulates that increased competition might negatively impact stability in the financial system. Efthyvoulou and Yildirim (2014) examine Lerner indices for a range of CESEE economies and show that foreign-owned banks achieve on average higher markups than their locally-owned peers. They also find that the global financial crisis put an end to a broad convergence trend of Lerner indices across countries and that the influence of asset quality and capitalization varies between the pre-crisis and post-crisis sample periods. Other studies on banking sector competition for CESEE economies focus solely on pre-crisis data (e.g., Agoraki et al., 2011).

The paper is structured as follows: the next section summarizes the theoretical framework, which lays the basis for estimating the Lerner index. Section 2 describes the data, and section 3 presents the empirical results. Finally, section 4 concludes.

1 Theoretical framework

The Lerner index corresponds to the markup of prices over marginal costs divided by prices (Lerner, 1934). Since the marginal costs of firms or banks are not directly observable, calculating the Lerner index requires estimating a cost function to derive marginal costs in a first step. Marginal costs and prices are then used to calculate the index in a second step.

1.1 The Lerner index

We follow the seminal work of Angelini and Cetorelli (2003) and assume that the banking sector normally follows an oligopoly. The special cases of perfect competition (Lerner index equals 0) and monopoly power (Lerner index equals 1) are also covered.⁵ To maximize profits, Π_j , each bank j sets equilibrium prices:

$$\max_{q_j} \Pi_j = p(Q, z)q_j - C(q_j, w_j) \quad (1)$$

Such a decision is based on cost considerations ($C(q_j, w_j)$) and on the degree of competition in the market measured by the inverse demand function $p(Q, z)$, where $Q = \sum_{j=1}^N q_j$ is the industry output of all N banks and z are exogenous variables that affect demand for bank services. For lack of data on the different products/services of a bank, we summarize all output of a bank in an aggregate banking product q_j which is approximated by the total assets of bank j . The three variables that enter the cost function are denoted by $w_{j,i}$: $w_{j,1}$ are interest expenses, $w_{j,2}$ staff expenses and $w_{j,3}$ other operating expenses ($w_j = \sum_{i=1}^3 w_{j,i}$). The price of the aggregate banking product (p_j) is defined as the ratio of the sum of interest income, fee income and income from investment to total assets.

The corresponding first order condition to equation (1) is

$$\Pi'_j = p_j - C'(q_j, w_j) + \frac{\Theta_j}{\varepsilon} = 0 \quad (2)$$

where the second term on the right-hand side measures the deviation from a perfectly competitive benchmark.⁶ In line with Angelini and Cetorelli (2003), the separate identification of Θ_j and ε is not required if one aims to analyze the bank's overall degree of market power. It is sufficient to estimate $\lambda = -\frac{\Theta_j}{\varepsilon}$. Dividing λ by the average price p yields the Lerner index.

$$L_j = \frac{p_j - C'(q_j, w_j)}{p_j} \quad (3)$$

The Lerner index is usually defined to be between 0 and 1, measuring the relative markup of price over marginal cost.

We assume the standard production technology for banks that is based on three inputs (deposits, labor and other costs)⁷ and a translog specification for the cost function.⁸

$$\ln(C_j) = \alpha_{1,j} + s_0 \ln(q_j) + \frac{s_1}{2} (\ln(q_j))^2 + \sum_{i=1}^3 c_i \ln(w_{j,i}) + \ln(q_j) \sum_{i=1}^3 s_{i+1} \ln(w_{j,i}) + c_4 \ln(w_{j,1}) \ln(w_{j,3}) + c_5 \ln(w_{j,1}) \ln(w_{j,2}) + c_6 \ln(w_{j,2}) \ln(w_{j,3}) + \sum_{i=1}^3 c_{i+6} \ln(w_{j,i})^2 \quad (4)$$

⁵ In case of negative profits, the Lerner index might become negative, but such a situation is not likely to be sustainable over a longer period, since such a bank would be expected to exit the market at some point.

⁶ The term Θ is usually defined as the conjectural elasticity of total industry output with respect to the output of the j^{th} firm and ε is the market demand semi-elasticity to the price.

⁷ Other costs include physical capital as described in the literature.

⁸ See Beck et al. (2013), Carbó Valverde and Rodríguez Fernández (2007), Coccoresse (2014) and Turk-Ariss (2010) for a similar cost function specification.

The primary advantage of the translog cost function is its flexibility. Many popular functional forms (e.g., the Cobb-Douglas specification) are restricted special cases of the translog cost function. The right hand-side variables are the output measures, the input prices, quadratic terms of them and all possible interaction terms.

For the estimation we rewrite equation (2) in the following way:

$$p_j = \frac{c_j}{q_j} (s_0 + s_1 \ln(q_j) + \sum_{i=1}^3 s_{i+1} \ln(w_{j,i})) + \alpha_{2,j} \quad (5)$$

We estimate equation (4) and equation (5) with a bank fixed effects seemingly unrelated regression model, separately for subsidiary and parent banks. The underlying assumption is that bank cost equations are very similar, but some banks are better managed than others, which is precisely captured by the fixed effects $\alpha_{1,j}$ and $\alpha_{2,j}$ for all banks j . So, except for the fixed effects, the other coefficients are the same for the subsidiaries (parents). In this way, we sacrifice some heterogeneity for more stability in the estimated coefficients.⁹

Bank-specific Lerner indices are then calculated based on the coefficients of the panel. The panel approach pursued in this study is in contrast to the framework used by Angelini and Cetorelli (2003), who estimate their simultaneous equation system for each year (cross section by cross section). Our approach takes advantage of the panel structure of our dataset (repeated observations of the same individuals and cross-equation error correlation). In addition, we impose cross-equation restriction that follows from economic theory and should improve the precision of the estimates (Bresnahan, 1989). In particular, we impose that the following parameters are equal across equations (4) and (5): s_0 , s_1 , s_2 , s_3 and s_4 .

2 Data

Our empirical analysis is primarily based on quarterly supervisory data reported by Austrian subsidiaries in CESEE under International Financial Reporting Standards (IFRS). These banking-related data consist of balance sheet, income statement and credit risk positions and are collected for 16 countries: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, FYR Macedonia, Hungary, Latvia, Poland, Romania, Russia, Serbia, Slovakia, Slovenia and Ukraine. In total we have quarterly data on 57 subsidiaries for the period from the first quarter of 2008 to the second quarter of 2016. Due to a structural break in regulatory reporting, earlier data of the same quality are not available. The number of subsidiaries per country varies between 1 (Albania, FYR Macedonia, Latvia) and 4 (Croatia, Romania, Serbia, Slovakia, Slovenia). Austrian banks' claims are largest on the Czech Republic, Croatia, Romania, Russia, Slovakia and Hungary (Wittenberger et al., 2014), with the Czech, Russian, Slovak and Croatian markets being the most profitable ones.¹⁰ For Austria, we use quarterly supervisory

⁹ We also do not estimate clustered standard errors, as most of the heteroscedasticity in the data is removed by either using ratios or taking the logarithm. Clustering on the bank level would yield unreliable estimates for some banks due to the small number of observations. To a lesser degree the same holds true on the country level. We also do not want to remove banks or countries with only a few observations from the estimation in order to estimate more reliable clustered standard errors. Removing these banks would cause a type of "survival bias" in the data. Finally, to calculate the Lerner index, as seen in equation (6), standard errors are irrelevant.

¹⁰ In absolute terms, viewed over the 2003-to-2015 period. See Kavan et al. (2016) for more details.

data reported by 745 domestically operating banks at the unconsolidated level according to national Generally Accepted Accounting Principles (GAAP). Most importantly, this implies that interest income earned by Austrian banks' subsidiaries abroad is neither included in the NIM nor in the net fee and commission income ratio (NFCIR). These two datasets ensure that there is no overlap in measuring the profitability in CESEE (subsidiary, investment) and in Austria (parent, alternative investment).¹¹

To prevent outliers from distorting the empirical analysis, we apply a two-stage cleaning algorithm suggested by Sigmund et al. (2017) to the variables used (except for log(total assets), see table 1 for further details). First, we eliminate outliers across banks for each time period. An observation is considered an outlier if it is too far from the median (more than four times the distance between the median and the 2.5% or 97.5% quantile). In a second stage, we eliminate outliers across time for each bank. Here, the threshold distance is defined as 12 times the distance between the median and the 10% or 90% quantile. Such parameters ensure that the number of removed observations remains limited and the resulting distributions exhibit a reasonable shape when judged from a qualitative perspective.¹²

Summary statistics of subsidiaries and parent banks are listed in table 1 below.

Table 1

Bank data summary

	Subsidiaries					Parent banks				
	Minimum	Median	Mean	Maximum	Variance	Minimum	Median	Mean	Maximum	Variance
log(total assets)	3.09	7.58	7.59	10.55	2.03	8.46	11.90	12.12	18.87	1.99
log(interest expenses/total assets)	-8.69	-5.19	-5.24	-3.43	0.40	-12.92	-6.11	-6.14	-3.12	0.62
log(staff expenses/total assets)	-11.27	-5.89	-5.88	-3.80	0.29	-13.53	-5.83	-5.89	-2.68	0.25
log(fee, commission and other expenses/total assets)	-8.29	-5.61	-5.58	-2.10	0.30	-11.00	-6.28	-6.28	-1.78	0.22
Total costs/total assets	0.00	0.01	0.01	0.13	0.00	-0.01	0.01	0.01	0.22	0.00

Source: Thomson Financial.

The data show that (based on the median) subsidiaries are generally smaller compared with their parents (in terms of total assets), they have similar staff expenses over total assets and larger revenues from fees relative to their parents.

We complement the bank-related data with a set of macroeconomic variables that has been proposed in the literature (see e.g., Delis, 2012; and Efthyvoulou and Yildirim, 2014). More specifically, we collect year-on-year CPI inflation and GDP growth, GDP per capita and institutional factors (the overall economic freedom indicator, property rights, freedom from corruption, economic freedom, business freedom, investment freedom and financial freedom, as provided by the Heritage Foundation; as well as the World Bank's control of corruption, government

¹¹ Branches only play a minor role (less than 0.1%) in terms of total lending abroad and are fully included in the cross-border lending of the respective Austrian bank. In this framework, any direct (without a subsidiary) cross-border activity of an Austrian bank is reflected in its home Lerner index. So, by looking at the parent and the subsidiary Lerner index, we give a full view on all activities related to CESEE markets.

¹² Our outlier detection mechanism is responsible for some gaps in chart 2. Other data gaps are due to confidentiality reasons. If there is only one subsidiary in a country, the Lerner index is not reported. These data are still used for the estimations, however.

effectiveness, political stability, regulatory quality and rule of law indicators). GDP per capita and institutional factors are available only in annual frequency, while all other data are made available in quarterly frequency. Annual data have been converted to quarterly data by simply reusing annual observations over the quarterly frequency domain. This can be rationalized by considering that the variables of annual frequency typically show only negligible time variation within a given year. From a macroeconomic perspective, the set of countries we cover is quite heterogeneous as it includes more advanced economies, euro area countries and less developed but dynamic economies as well as more fragile ones.

3 Results

In this section, we first analyze the coefficients of the cost function, i.e., equation (4), for CESEE and Austria, which are a necessary input for the derivation of the Lerner index. We then discuss the estimated Lerner indices and finally investigate the determinants of the Lerner indices of Austrian subsidiaries.

3.1 Results of the cost functions

We report the results of the translog cost function, i.e., equation (4), in tables 2 and 3.

Table 2

Estimates of translog cost function – CESEE subsidiaries

Variable name	Estimate	Standard error	t-value	Pr(> t)
log(total assets)	0.968	0.006	155.996	0.000
log(total assets)^2	0.002	0.000	3.929	0.000
log(interest expenses/total assets)	0.244	0.010	25.349	0.000
log(staff expenses/total assets)	0.203	0.015	13.916	0.000
log(fee, commission and other expenses/total assets)	0.390	0.012	32.089	0.000
log(total assets)*log(interest expenses/total assets)	0.002	0.001	3.199	0.001
log(total assets)*log(staff expenses/total assets)	-0.003	0.001	-3.578	0.000
log(total assets)*log(fee, commission and other expenses/total assets)	-0.001	0.001	-1.670	0.095
log(interest expenses/total assets)*log(staff expenses/total assets)	-0.084	0.002	-40.986	0.000
log(interest expenses/total assets)*log(fee, commission and other expenses/total assets)	-0.135	0.002	-84.780	0.000
log(staff expenses/total assets)*log(fee, commission and other expenses/total assets)	-0.066	0.002	-32.617	0.000
log(interest expenses/total assets)^2	0.101	0.001	185.589	0.000
log(staff expenses/total assets)^2	0.064	0.001	57.286	0.000
log(fee, commission and other expenses/total assets)^2	0.103	0.001	154.601	0.000
R2				0.9999
Adjusted R2				0.9999
Number of banks				57.0000
Average number of time periods				24.1356
Number of total observations				1,424.0000

Source: Authors' calculations.

Clearly, the greatest driver of log(total costs) are log(total assets). Other important drivers are log(interest expenses divided by total assets), log(staff expenses divided by total assets) and log(other costs over total assets). The coefficients of the interaction terms with log(total assets) show that there are economies of scale with respect to

log(staff expenses divided by total assets) but a positive interaction effect with log(interest expenses divided by total assets).

The results for Austrian parent banks are displayed in table 3 and show a similar picture.

Table 3

Estimates of translog cost function – Austrian parent banks

Variable name	Estimate	Standard error	t-value	Pr(> t)
log(total assets)	0.912	0.015	59.142	0.000
log(total assets)^2	0.001	0.001	0.956	0.339
log(interest expenses/total assets)	0.335	0.009	39.382	0.000
log(staff expenses/total assets)	0.425	0.016	27.106	0.000
log(fee, commission and other expenses/total assets)	0.747	0.015	49.158	0.000
log(total assets)*log(interest expenses/total assets)	0.012	0.000	33.095	0.000
log(total assets)*log(staff expenses/total assets)	−0.017	0.001	−14.656	0.000
log(total assets)*log(fee, commission and other expenses/total assets)	−0.006	0.001	−7.445	0.000
log(interest expenses/total assets)*log(staff expenses/total assets)	−0.055	0.001	−50.616	0.000
log(interest expenses/total assets)*log(fee, commission and other expenses/total assets)	−0.050	0.001	−49.783	0.000
log(staff expenses/total assets)*log(fee, commission and other expenses/total assets)	−0.038	0.002	−20.928	0.000
log(interest expenses/total assets)^2	0.036	0.001	43.636	0.000
log(staff expenses/total assets)^2	0.074	0.001	69.487	0.000
log(fee, commission and other expenses/total assets)^2	0.063	0.000	195.794	0.000
R2				0.9993
Adjusted R2				0.9993
Number of banks				745.0000
Average number of time periods				29.8800
Number of total observations				22,263.0000

Source: Authors' calculations.

It is worth noting that, compared with Angelini and Cetorelli (2003), our estimation results are in a much more credible range and have economically meaningful signs.¹³ These superior properties might be attributed to the panel estimation approach we pursue, which seems well suited for the dataset at hand. The plausibility check of the estimated parameters of the cost function ensures confidence in the analysis that is to follow.

3.2 Estimated Lerner indices for Austrian subsidiaries in CESEE

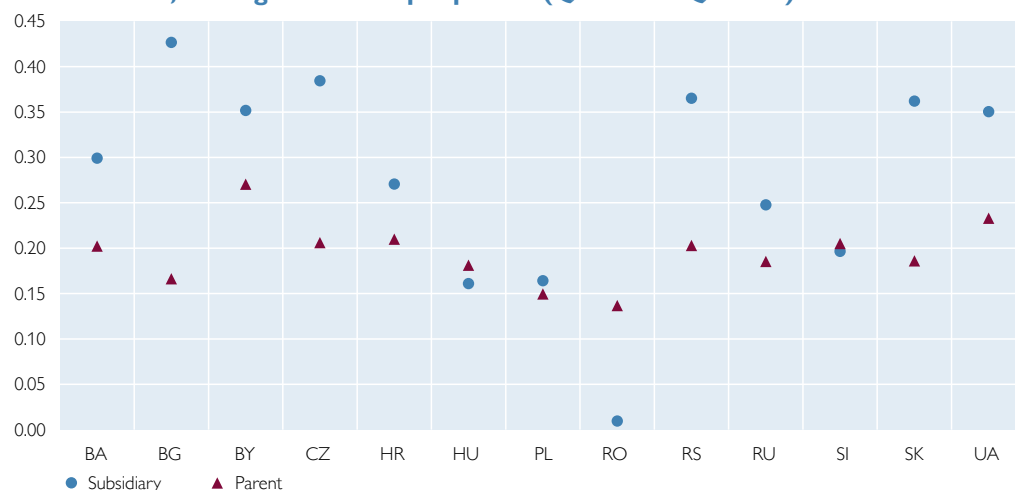
The Lerner index for each bank j in each period t is calculated based on the coefficients in tables 2 and 3 (see Fischer and Hempel, 2006):

$$L_{j,t} = \frac{p_{j,t} - \frac{C_{j,t}}{q_{j,t}}(\hat{c}_0 + \hat{c}_1 \ln(q_{j,t}) + \sum_{i=1}^3 \hat{s}_{i+1} \ln(w_{j,i}))}{p_{j,t}} \quad (6)$$

¹³ Turk-Ariss (2010) also estimates Lerner indices for a broad range of countries, but without estimating an explicit cost function. Instead, she regresses the Lerner index on a cost-efficiency measure and an alternative profit-efficiency measure, which might render results prone to endogeneity issues.

Chart 1

Lerner index, average over sample period (Q1 2008 – Q2 2016)



Source: Authors' calculations.

Note: The plot shows cross-country means of estimated Lerner indices of CESEE subsidiaries and Austrian parent banks, averaged over banks within a given country and over time. For confidentiality reasons, we do not show data for countries where only one subsidiary is present (i.e., Albania, Latvia and FYR Macedonia).

To get a first impression and to see whether there are significant differences between the estimated markups for subsidiaries and those for parents, we calculate Lerner indices, averaged over banks within a country and over the sample period. The results are shown in chart 1, with blue (circles) referring to Lerner index values of subsidiaries and red (triangles) to parent banks, respectively.

First, we see that our estimates of the Lerner index are generally well behaved and positive. For single banks negative values appear occasionally; these are not shown in the chart, however. Pricing below marginal costs might serve as a strategy to deter the entry or induce the exit of other competitors into/from the market (Coccorese, 2014) but is unlikely to be sustainable in the long run. Looking at cross-country heterogeneity, we find the highest Lerner index for subsidiaries (on average) in Bulgaria (0.43) and the smallest in Latvia (0.05). In Romania, the mean Lerner index over the sample period is even smaller (0.01). However, this result is driven by one starkly negative observation in one time period. The same applies for subsidiaries in Russia. The median, which is a statistic more robust to outliers, indicates a Lerner index for subsidiaries of 0.29 for both Romania and Russia, which is rather high compared with the other countries. For the remaining countries, mean and median statistics are very close. Overall, our estimates lie in the range of those of other empirical studies, such as Agoraki et al. (2011), Coccorese (2014) and Weill (2013), although these studies typically use other time periods, estimation techniques and datasets and typically focus on both domestic and foreign-owned banks. Next, the chart shows that on average

Table 4

Welch two sample t-test

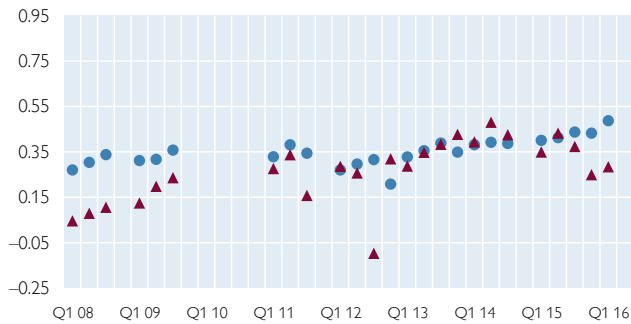
	Subsidiaries	Parent banks
Mean	0.250	0.175
t-statistic	2.690	
Degrees of freedom	66.379	
p-value	0.009	

Source: Authors' calculations.

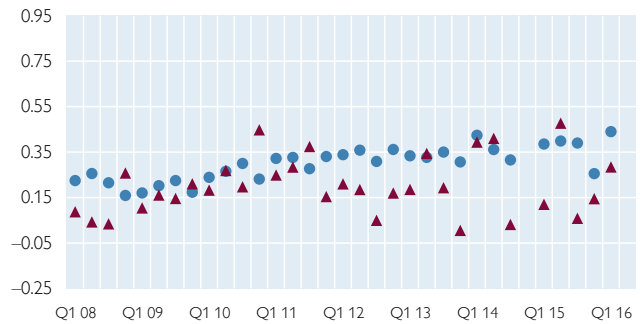
Note: Tests of equal means of subsidiary and parent banks' Lerner indices. Underlying observations are averaged over the sample period. Alternative hypothesis: true difference in means is not equal to 0.

Lerner index per country and over time (part 1)

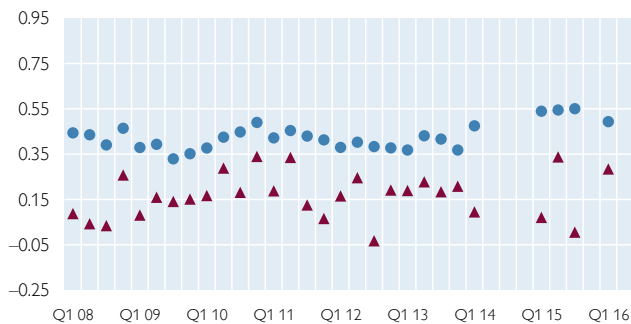
Belarus



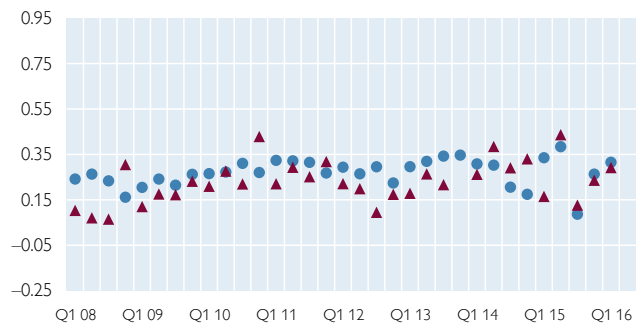
Bosnia and Herzegovina



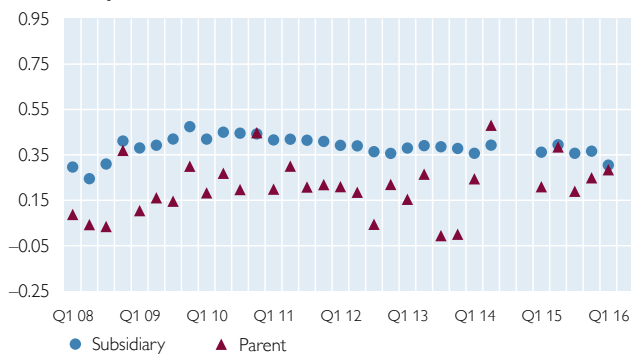
Bulgaria



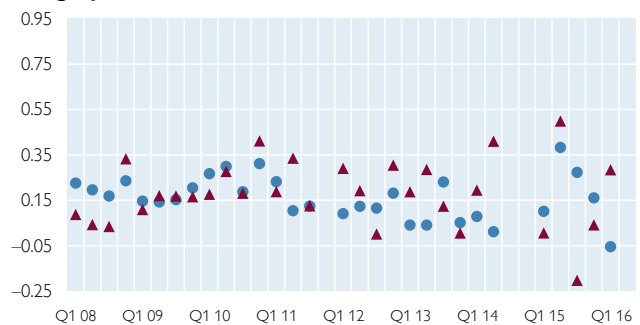
Croatia



Czech Republic



Hungary



Source: Authors' calculations.

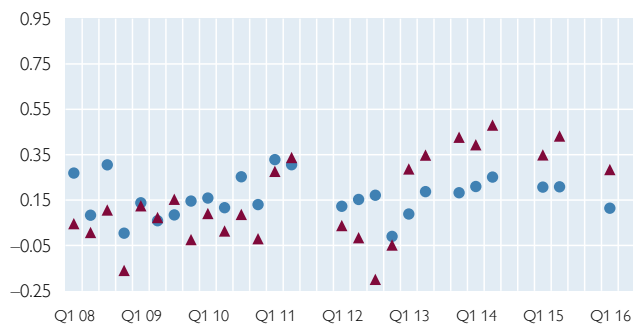
Note: The plots show the evolution of estimated Lerner index pairs of CESEE subsidiaries and corresponding Austrian parent banks (averaged over banks within a given country). To ease the readability of the plots, we limited the Lerner index to a range between -0.25 and 1. For confidentiality reasons, we do not show data for countries where only one subsidiary is present (i.e., Albania, Latvia and FYR Macedonia).

markups are higher in subsidiary countries than in the home market of the parent banks, Austria. This result is in line with literature findings that markups are generally higher in less developed countries than in more advanced economies (Coccorese, 2014; Claessens and van Horen, 2012; Delis, 2012; World Bank, 2012). At first glance, our results corroborate these general trends from the literature. Notable exceptions are the Czech Republic and Slovakia. Both countries are more advanced relative to their peers, but the markups in the banking sector are rather high (see also Kavan and Widhalm, 2014, with respect to a descriptive profitability assessment). A more systematic analysis regarding the drivers of Lerner indices is

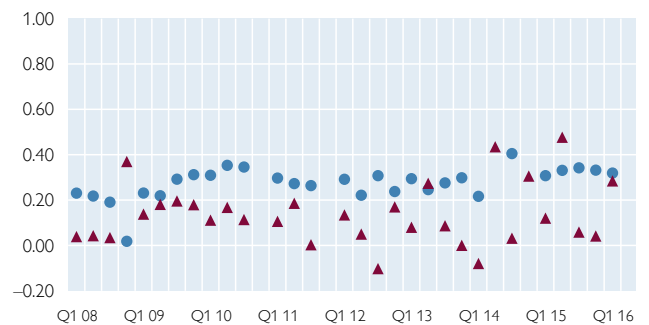
Chart 3

Lerner index per country and over time (part 2)

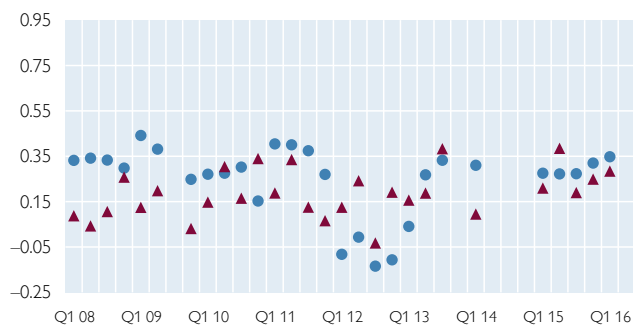
Poland



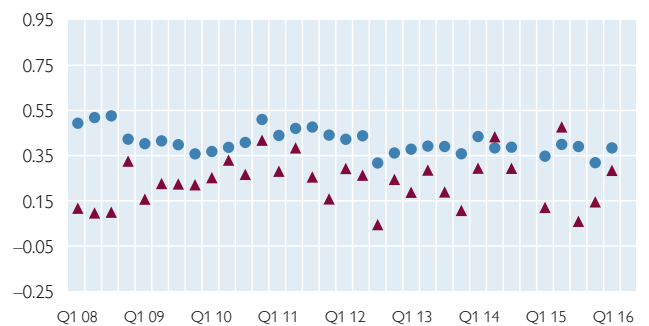
Romania



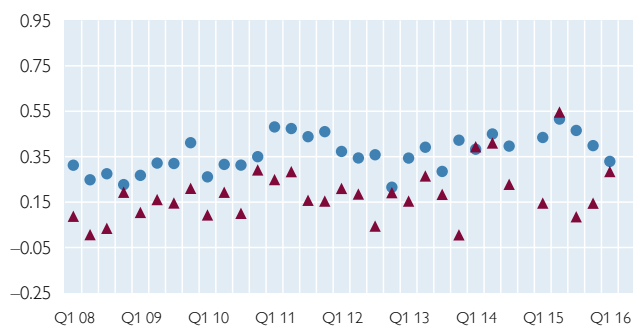
Russia



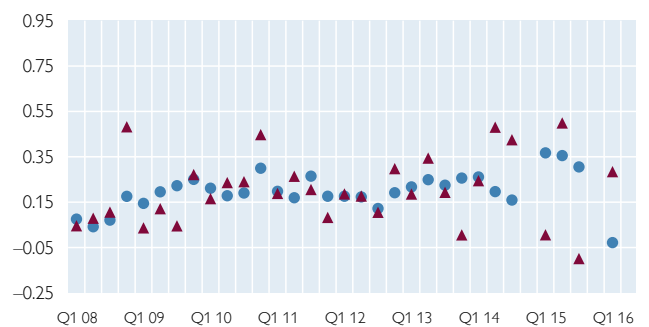
Serbia



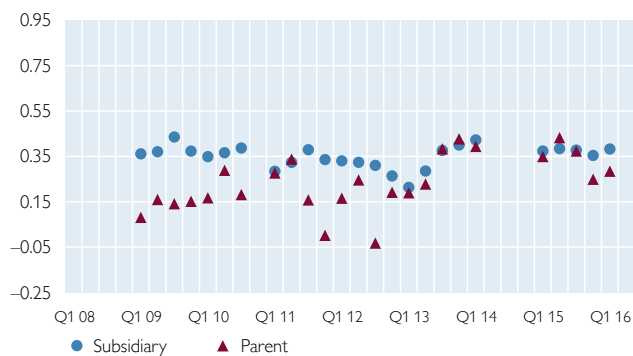
Slovakia



Slovenia



Ukraine



Source: Authors' calculations.

Note: The plots show the evolution of estimated Lerner index pairs of CESEE subsidiaries and corresponding Austrian parent banks (averaged over banks within a given country). To ease the readability of the plots, we limited the Lerner index to a range between -0.25 and 1. For confidentiality reasons, we do not show data for countries where only one subsidiary is present (i.e., Albania, Latvia and FYR Macedonia).

carried out in the next subsection. To investigate differences between parent banks and subsidiaries further, we carry out a simple t-test for differences in the mean of the two groups, where we again average the underlying observations over time. The test – depicted in table 4 – clearly rejects the null hypothesis of equal means, which corroborates the impression gleaned from chart 1 that the Lerner index is in general higher for subsidiaries than for parent banks.

Next, we investigate time patterns of the Lerner index per country, which are depicted in charts 2 and 3. To ease the readability of the charts as well as cross-country comparison, we have limited the Lerner indices displayed to the range between -0.25 and 1 .¹⁴ Some observations emerge from the data. First, in some countries, variation over time – measured by the coefficient of variation – is much higher for subsidiaries than for the associated parent banks. Countries that fall into this category comprise Romania, Latvia and Russia. To examine the dynamics of Austrian subsidiaries and parent banks' profitability in greater detail, we regress the average Lerner index (per country) on a simple time trend plus a constant term. This exercise shows evidence for an increase in markups for subsidiaries in some economies, namely Belarus, Bulgaria, Latvia, FYR Macedonia, Slovakia and Slovenia. Given the fact that the literature indicates generally higher levels of profitability prior to the crisis (see e.g., Kavan et al., 2016), this finding might indicate a (small) recovery to pre-crisis levels. For the remaining countries, the estimates are not significant (or even negative). For some countries, regulatory changes over the sample period might partially account for this. For example, Kavan et al. (2016) point out the increase in subsidiaries' other operating expenses due to measures to curb foreign currency loans, local bank levies as well as changes in business structures.¹⁵ As a last observation, we note that for countries in which no evidence of an increase in markups for Austrian subsidiaries was found, in many cases the associated parent banks' market power increased positively and significantly over time. We examine this potentially negative relationship between the markups of subsidiary and parent banks in more detail in the next subsection.

3.3 What drives markups of Austrian subsidiaries in CESEE?

In this section, we investigate the determinants of Austrian subsidiaries' Lerner indices, with a particular focus on the Lerner index of the parent bank. In other words, does the markup of a parent bank influence the markup of its subsidiary? Through synergies, similar business models and funding costs the parent bank could influence its subsidiaries' profit margin. Studies not looking at the subsidiary-parent bank nexus primarily relate measures of markups to bank-related variables on the one hand and macroeconomic factors on the other hand. Delis (2012) uses a panel of 84 advanced and emerging economies and finds that financial liberalization policies, the degree of economic development and the quality of institutions determine market power in the banking sector.

¹⁴ Observations that fall outside this range comprise those for FYR Macedonia (in the fourth quarter of 2013) and Romania (in the second and fourth quarters of 2014).

¹⁵ See Beckmann (2017) for an overview of these measures for CESEE economies.

In what follows, we regress the Lerner index for subsidiary j at time t , $L_{j,t}$, on a set of control variables:

$$L_{j,t} = \alpha_j + \beta' X_{j,t} + \varepsilon_{j,t}. \quad (7)$$

Here, $X_{j,t}$ denotes a set of K explanatory variables, $\varepsilon_{i,t}$ the idiosyncratic error term ($j \sim N(0; \sigma_e^2)$) and α_j the bank fixed effect. We opt to include a broad set of variables a priori and then use a model-selection algorithm to obtain a specification that best describes the Lerner index. The results of the selected model are then compared with established findings from the literature.

The set of possible explanatory variables draws on the empirical literature on the Lerner index and includes four bank-specific variables: (1) the Lerner index of the associated parent bank, which is our focal determinant, (2) the leverage ratio (of the subsidiary, defined as capital over assets), (3) log(total assets) as a proxy for the size of the subsidiary and the loan loss provision ratio (LLPR) to account for the riskiness of a bank's loan portfolio. We add the following macroeconomic variables: (1) year-on-year GDP growth, (2) inflation and (3) GDP per capita. Finally, we follow Delis (2012) and control for institutional quality, corruption, or financial freedom by adding (1) the overall economic freedom indicator, (2) property rights, (3) freedom from corruption, (4) economic freedom, (5) business freedom, (6) investment freedom and financial freedom, (7) control of corruption, (8) government effectiveness, (9) political stability, (10) regulatory quality and (11) rule of law indicators. Since empirical research suggests a nonlinear relationship of bank size and markups (see, e.g., Coccorese, 2014; or Fernández de Guevara and Maudos, 2007), we also include interaction terms of total assets with the remaining variables.

To examine the model space and make a choice from among the set of potential regressors, we apply the best subset algorithm of Furnival and Wilson (1974) that has been recently extended for fixed effects panel models by Siebenbrunner et al. (2017).¹⁶ We consider the five best models for each model size if possible (there exists only one model with all possible regressors). To find the best model among the different model sizes, we apply the Bayesian information criterion. The results for the model that achieve the best fit are displayed in table 5.

Several salient features emerge from the regression analysis. First,

Table 5

Determinants of the Lerner index

Variable name	Estimate	Standard error	t-value	Pr(> t)
Lerner index parent banks	−0.1661	0.0573	−2.8996	0.0038
Leverage ratio	2.1000	0.4519	4.6474	0.0000
Total assets	0.1134	0.0743	1.5272	0.1271
GDP per capita	−0.0002	0.0000	−3.2476	0.0012
Total assets × GDP per capita	0.0000	0.0000	2.0369	0.0420
Loan loss provisions	0.5026	0.2191	2.2939	0.0220
Within R2				0.06
Adjusted within R2				0.00
Overall R2				0.59
Between R2				0.48
BIC				−403.52

Source: Authors' calculations.

¹⁶ For each of the selected fixed effects models, we test for the importance of individual effects (α_j) ex post. This is done with the Breusch-Pagan Lagrangian multiplier test (Breusch and Pagan, 1980). We also perform the test proposed by Honda (1985) as well as a standard F-test. All three tests lead to the conclusion that individual effects matter. Finally, we perform the Hausman (1978) test that tipped the scales in favor of the fixed effects model. All test statistics are available from the authors upon request.

mostly bank-related variables turn out to be significantly related to banks' markups, namely the leverage ratio, an interaction term of total assets with real GDP per capita and loan loss provisions. The positive coefficient for the leverage ratio indicates that better-capitalized banks achieve higher markups. Since capital is the most expensive form of liability, a strong capitalization is indicative of a bank's high creditworthiness, which goes hand in hand with lower funding costs. This "reputation" effect was also demonstrated in Havrylchyk and Jurzyk (2011), while Efthyvoulou and Yildirim (2014), using broadly the same time period as in this study, do not find evidence of this effect for foreign banks. Our finding is also important from a macroprudential point of view: considering the fact that the Lerner index is a very good proxy for the profitability of banks, many arguments put forward against the requirement of better-capitalized banks when Basel III was introduced might be unsustainable.¹⁷ Next, we find a positive and significant relationship between loan loss provisions and markups. This implies that banks with higher provisions are associated with higher markups and hints at a revenue-risk tradeoff. It basically confirms the fundamental economic theory that risk and return are correlated. The higher the risk of loan impairments is, the higher is the Lerner index. On average, banks are able to take this tradeoff into account when setting their markups.

Finally, our model-selection algorithm revealed the interaction term of real GDP per capita with the size of the bank (as measured by total assets) as an important determinant of the Lerner index of Austrian subsidiaries in CESEE.¹⁸ The interpretation of coefficients in a linear regression model with multiplicative terms is slightly different from that of a simple linear regression. First, since both variables that form the multiplicative term are continuous, the effect of bank size on the Lerner index can only be evaluated for different values of real GDP per capita (see Brambor et al., 2006). We vary real GDP per capita from the minimum to the maximum value that we observe in our sample and calculate the respective marginal effect on the Lerner index. This exercise reveals a positive relationship between the total assets and markups of Austrian subsidiaries. This finding is in line with Coccorese (2009), who uses a large international dataset and shows that larger banks may profit from cost advantages.¹⁹ Our results further indicate that the positive effect of total size on the Lerner index increases with real GDP per capita. This implies that the more developed the host country is in economic terms, the greater the benefits are which the subsidiary can reap from cost advantages. Due to the interaction terms included, also the interpretation of the main terms (real GDP per capita and total assets) changes compared with a standard linear regression. More precisely and focusing on the effects of total assets, the attached coefficient in table 5 indicates the effect of bank size on the Lerner index for the

¹⁷ See Schmitz et al. (2017) for a new view on how solvency affects banks' profitability indirectly through its interaction with funding costs.

¹⁸ More precisely, the algorithm selected a model including only one parent of the interaction term, total assets times real GDP per capita, namely real GDP per capita. As outlined in Brambor et al. (2006), however, it is imperative to include all parents of the interaction term to conduct meaningful inference. We hence augmented the model to feature also total assets.

¹⁹ There are also studies reporting the opposite. For example, Gunter et al. (2013) do not find a significant correlation of bank size with the Lerner index for Austrian banks. More specifically, their results show that primary banks have a higher Lerner index than non-primary banks. Primary banks in Austria operate on small regional bank markets and therefore have more information on their potential customers.

case of zero real GDP per capita income. Similarly, the coefficient of real GDP per capita provided in table 5 refers to a bank having zero total assets. Since both situations are highly unrepresentative of our data sample, we estimate the model in table 5 without the interaction term (in which the coefficients of bank size and real GDP per capita refer to the average effects). These estimations corroborate the positive (unconditional) relationship between bank size and markups of Austrian subsidiaries, whereas the coefficient attached to real GDP per capita is statistically negative but close to zero. Finally, when turning to the focal variable – the Lerner index of the parent bank, we find a significant and negative relationship in the data. This implies that the profitability of subsidiaries is negatively related to opportunity costs – as measured by the parent banks' Lerner index – in the home markets of the parent banks. In this sense, our results generalize findings of Havrylchyk and Jurzyk (2011), who report this negative relationship only for subsidiaries in CESEE that have been acquired by taking over existing domestic banks. The negative relationship of investment conditions in parent banks' home countries and the profitability of their subsidiaries in foreign host countries is also demonstrated in Moshirian (2001) and De Haas and Van Lelyveld (2006).²⁰ Taken at face value, this implies that especially those banks that gain comparably smaller markups in the home market compensate for the lack of profitability with subsidiaries that are associated with higher markups. Finally, the results provided in table 5 generally hint at a very small set of factors that determine the Lerner index. In particular, the macroeconomic environment in the host country does not seem to be a determining factor for a bank's market power. Moreover, variables related to institutional quality, corruption, or financial freedom all turn out to be statistically insignificant. This contrasts results of Delis (2012), who concludes that a certain level of institutional quality is a precondition for the success of reforms that aim at enhancing competition and efficiency in the banking sector. Such differences might arise because we use post-crisis data, focus on parent banks and their subsidiaries and also on a specific region, namely Austria and CESEE, and pursue a state-of-the-art statistical framework, which has hitherto not been used in the existing literature (see Siebenbrunner et al., 2017, for more details on the statistical properties of the econometric framework).

To ensure that our results are not driven by observations related to particular countries in the sample, and since we include bank rather than country fixed effects, we carry out a robustness exercise.

More precisely, we re-estimate the model provided in table 5 N=16 times, each time dropping one country from the sample. The results are provided in table 6.

The middle panel shows the median over the estimated coefficients together with ± 1 standard deviation (SD) bounds. The table indicates that the coefficients are not shaped by the inclusion of a particular country.

Table 6

Cross-country robustness exercise

	Median – 1 SD	Median	Median + 1 SD
Lerner index parent banks	–0.2255	–0.1749	–0.1243
Leverage ratio	1.7525	2.1394	2.5262
Total assets	0.0667	0.1173	0.1679
GDP per capita	–0.0002	–0.0002	–0.0001
Total assets x GDP per capita	0.0000	0.0000	0.0000
Loan loss provisions	0.3337	0.5095	0.6852

Source: Authors' calculations.

²⁰ Again, this view is challenged by Efthyvoulou and Yildirim (2014), who find the counterintuitive opposite result, namely that market power of foreign banks increases with GDP growth (as a measure of opportunity costs/alternative investment) in the home country.

4 Summary and conclusions

Over the years, subsidiaries of Austrian banks in CESEE have substantially contributed to the profitability of the Austrian banking sector. With the onset of the global financial crisis, the operating income of Austrian subsidiaries came under pressure, and profitability across the region started to diverge. This study is the first to provide a systematic assessment of profitability developments for Austrian parent and subsidiary banks for the post-crisis period and, more generally, to compare two banking markets that are interrelated via ownership. For that purpose, we have collected a unique dataset that draws on regulatory reports of over 800 banks. Market power – and thus profitability – is assessed by estimating Lerner indices, which measure the extent to which the price charged by a bank for a loan diverges from the price that would emerge under perfect competition in the market. Our results are as follows: First, we find that Lerner indices for Austrian subsidiaries in CESEE are positive and range from 0.05 (Latvia) to 0.4 (Bulgaria). The fact that markups are positive indicates a sound level of profitability. This result is well in line with a series of papers providing a descriptive assessment of profitability (Kavan and Widhalm, 2014; Kavan and Martin, 2015; Kavan et al., 2016; Wittenberger et al., 2014). Comparing estimates of the Lerner index of Austrian subsidiaries with those of their parent institutions shows that subsidiaries record – on average – higher profitability than their parent bank. This finding might empirically corroborate Austrian banks' investment decision to enter new markets in CESEE.

Second, we examine the drivers of subsidiaries' Lerner indices by evaluating a battery of competing models that include bank characteristics as well as macroeconomic data and indicators of institutional quality, economic freedom, government efficiency and corruption. Our estimates show that only a small number of factors can account for differences in estimated Lerner indices, which are mostly related to bank rather than macroeconomic factors. More specifically, Lerner indices for subsidiaries tend to be higher for well-capitalized banks, banks with higher loan loss provision ratios and larger banks in more developed economies. We thus find evidence for the importance of having well-capitalized banks, since they are not only more resilient to adverse shock but also more profitable (in normal times). That higher loan loss provisions are associated with higher markups empirically validates the well-known tradeoff between risk and return. We also find that markups are higher for larger banks due to cost efficiency gains. This effect, however, varies with the level of economic development of the host country; especially in more developed economies larger banks can fully reap the benefits of cost efficiency, which is reflected in higher markups. Our results further show that the Lerner index of the parent bank is negatively correlated with the size of the subsidiaries' markup. In combination with the finding of generally higher markups of subsidiaries in CESEE, this result implies that especially banks with rather low profitability at home chose to enter new markets. We do not find empirical evidence that macroeconomic or institutional factors play a role in determining the size of the markup.

From a policy perspective and in a world of increased financial globalization, our study highlights the need for policy coordination between home and host countries. First, the expansionary business model of Austrian parent banks conquering markets in CESEE seems justified from a profitability perspective. Our results empirically underpin the important role the CESEE region plays for the Austrian

banking sector. They also show that higher profitability often goes hand in hand with higher risks. That said, an exogenous shock – as witnessed in 2008 – can also hit the home country, turning a regionally diversified profit base into an important risk buffer. Second, also host-country authorities have to closely monitor the macroeconomic environment of the parent banks' home countries: as evidenced in this study, investment opportunities in home countries may result in a decrease of markups in host countries, which in turn impacts on financial stability in the host countries.

References

- Agoraki, M., M. Delis and F. Pasiouras. 2011.** Regulations, competition and bank risk-taking in transition countries. In: *Journal of Financial Stability* 7(1). 38–48.
- Angelini, P. and N. Cetorelli. 2003.** The Effects of Regulatory Reform on Competition in the Banking Industry. In: *Journal of Money, Credit and Banking* 35(5). 663–684.
- Barisitz, S. 2008.** Banking Transformation (1989–2006) in Central and Eastern Europe – with Special Reference to Balkans. Bank of Greece Working Paper 78/2008.
- Barisitz, S. and S. Gardó. 2009.** Banking Sector Transformation in CESEE. In: *Focus on European Economic Integration. Special Issue. December.* Vienna: OeNB. 92–100.
- Beck, T., O. De Jonghe and G. Schepens. 2013.** Bank competition and stability: Cross-country heterogeneity. In: *Journal of Financial Intermediation* 22(2). 218–244.
- Beckmann, E. 2017.** How does foreign currency debt relief affect households' loan demand? Evidence from the OeNB Euro Survey in CESEE. In: *Focus on European Economic Integration Q1/17.* Vienna: OeNB. 8–32.
- Bonin, J., I. Hasan and P. Wachtel. 2005.** Bank performance, efficiency and ownership in transition countries. In: *Journal of Banking & Finance* 29(1). 31–53.
- Brambor, T., W. Clark and M. Golder. 2006.** Understanding Interaction Models: Improving Empirical Analyses. In: *Political Analysis* 14(1). 63–82.
- Bresnahan, T. 1989.** Empirical Studies of Industries with Market Power. In: Schmalensee, R. and R.D. Willig (eds.). *Handbook of Industrial Organization.* Amsterdam: North Holland.
- Breusch, T. and A. Pagan. 1980.** The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics. In: *Review of Economic Studies* 47(1). 239–253.
- Buch, C. 2000.** Why Do Banks Go Abroad? – Evidence from German Data. In: *Financial Markets, Institutions & Instruments* 9(1). 33–67.
- Carbó Valverde, S. and F. Rodríguez Fernández. 2007.** The determinants of bank margins in European banking. In: *Journal of Banking & Finance* 31(7). 2043–2063.
- Claessens, S. and N. van Horen. 2012.** Being a foreigner among domestic banks: Asset or liability? In: *Journal of Banking & Finance* 36(5). 1276–1290.
- Coccorese, P. 2009.** Market power in local banking monopolies. In: *Journal of Banking & Finance* 33(7). 1196–1210.
- Coccorese, P. 2014.** Estimating the Lerner index for the banking industry: a stochastic frontier approach. In: *Applied Financial Economics* 24(2). 73–88.
- Cull, R., M. S. Martinez Peria and J. Verrier. 2017.** Bank Ownership: Trends and Implications. IMF Working Paper 17/60.
- De Haas, R. and I. Van Lelyveld. 2006.** Foreign banks and credit stability in Central and Eastern Europe: A panel data analysis. In: *Journal of Banking & Finance* 30(7). 1927–1952.
- Delis, M. 2012.** Bank competition, financial reform, and institutions: the importance of being developed. In: *Journal of Development Economics* 97(2). 450–465.

- Detragiache, E., T. Tressel and P. Gupta. 2008.** Foreign banks in poor countries: theory and evidence. In: *The Journal of Finance* 63(5). 2123–2160.
- Efthyvoulou, G. and C. Yildirim. 2014.** Market power in CEE banking sectors and the impact of the global financial crisis. In: *Journal of Banking and Finance* 40. 11–27.
- Fernández de Guevara, J. and J. Maudos. 2007.** Explanatory factor of market power in the banking system. In: *The Manchester School* 75(3). 275–296.
- Fischer, K. and H. Hempel. 2006.** Regional Markets, Oligopoly, and Market Power in Banking. Unpublished.
- Furnival, G. and R. Wilson. 1974.** Regressions by Leaps and Bounds. In *Technometrics* 16(4). 499–511.
- Gormley, T. A. 2014.** Costly information, entry, and credit access. In: *Journal of Economic Theory* 154. 633–667.
- Green, C., V. Murinde and I. Nikolov. 2004.** The Efficiency of Foreign and Domestic Banks in Central and Eastern Europe: Evidence on Economies of Scale and Scope. In: *Journal of Emerging Market Finance* 3(2). 175–205.
- Gunter, U., G. Krenn and M. Sigmund. 2013.** Macroeconomic, Market and Bank-Specific Determinants of the Net Interest Margin in Austria. In: *Financial Stability Report* 25. Vienna: OeNB. 87–101.
- Hausman, J. 1978.** Specification tests in econometrics. In: *Econometrica* 46(6). 1251–1271.
- Havrylchyk, O. and E. Jurzyk. 2011.** Profitability of foreign banks in Central and Eastern Europe. In: *Economics of Transition* 19(3). 443–472.
- Honda, Y. 1985.** Testing the Error Components Model with Non-Normal Disturbances. In: *Review of Economic Studies* 52(4). 681–690.
- Jeon, B., M. Olivero and J. Wu. 2011.** Do foreign banks increase competition? Evidence from emerging Asian and Latin American banking markets. In: *Journal of Banking & Finance* 37(3). 952–972.
- Kavan, S. and F. Martin. 2015.** The profitability of Austrian banks' subsidiaries in Croatia, Hungary and Romania and how the financial crisis affected their business models. In: *Financial Stability Report* 29. Vienna: OeNB. 58–71.
- Kavan, S. and D. Widhalm. 2014.** Austrian subsidiaries' profitability in the Czech Republic and Slovakia – CESEE margins with an Austrian risk profile. In: *Financial Stability Report* 28. Vienna: OeNB. 59–68.
- Kavan, S., G. Ebner, E. Endlich, A. Greiner, M. Gruber, G. Hobl, M. Ohms, V. Redak, A. Schober-Rhomberg, P. Stockert, D. Widhalm and T. Wittenberger. 2016.** The profitability of Austrian banking subsidiaries in CESEE: driving forces, current challenges and opportunities. In: *Financial Stability Report* 32. Vienna: OeNB. 64–79.
- Lerner, A. P. 1934.** The Concept of Monopoly and the Measurement of Monopoly Power. In: *The Review of Economic Studies* 1(3). 157–175.
- Moshirian, F. 2001.** International investment in financial services. In: *Journal of Banking & Finance* 25(2). 317–337.
- Pawłowska, M. 2012.** Competition, concentration and foreign capital in the Polish banking sector (prior and during the financial crisis). *National Bank of Poland Working Paper* 130.
- Poghosyan, T., and A. Poghosyan. 2010.** Foreign bank entry, bank efficiency and market power in Central and Eastern European countries. In: *Economics of Transition* 18(3). 571–598.
- Schmitz, S., M. Sigmund and L. Valderrama. 2017.** Bank Solvency and Funding Cost: New Data and New Results. *IMF Working Paper* 17/116.
- Siebenbrunner, C., M. Sigmund and S. Kerbl. 2017.** Can bank-specific variables predict contagion effects? In: *Quantitative Finance*. Forthcoming.

- Sigmund, M., U. Gunter, and G. Krenn 2017.** How do Macroeconomic and Bank-Specific Variables Influence Profitability in the Austrian Banking Sector? Evidence from a Panel Vector Autoregression Analysis. In: Economic Notes. Forthcoming.
- Turk-Ariss, R. 2010.** On the implications of market power in banking: Evidence from developing countries. In: Journal of Banking & Finance 34(4). 765–775.
- Weill, L. 2013.** Bank competition in the EU. How has it evolved? In: Journal of International Financial Markets, Institutions & Money 26. 100–112.
- Wittenberger, T., D. Widhalm, M. Lahnsteiner and S. Barisitz. 2014.** Macrofinancial developments in Ukraine, Russia and Turkey from an Austrian financial stability perspective. In: Financial Stability Report 27. Vienna: OeNB. 64–73.
- World Bank. 2012. Global Financial Development Report 2013.** Rethinking the Role of the State in Finance.

CESEE-related abstracts from other OeNB publications

The abstracts below alert readers to studies on CESEE topics in other OeNB publications. Please see www.oenb.at for the full-length versions of these studies.

Manuel Gruber,
Stefan Kavan,
Paul Stockert

What drives Austrian banking subsidiaries' return on equity in CESEE and how does it compare to their cost of equity?

This short study analyzes the relative profitability of Austrian banking subsidiaries in Central, Eastern and Southeastern Europe (CESEE) using two separate approaches. First, we address the subject from an accounting point of view based on a DuPont analysis. We dissect the return on (the book value of average) equity (ROE) to highlight how profit and loss drivers as well as financial leverage affected this profitability metric from 2004 to 2016. This prepares the ground for our second part, where we switch to a market perspective for the period from 2006 to 2016 to deduce the cost of (average) equity (COE) of these subsidiaries from the Capital Asset Pricing Model (CAPM) in order to compare the model-based profits that would be expected (i.e. demanded) by investors to those that have actually been realized. The analysis is complemented by a similar exercise for a peer group consisting of listed CESEE banks. We find that the ROE dropped substantially during the global financial crisis and only started to recover in 2016. An accounting-based DuPont analysis reveals that – over the entire analyzed time span – this was primarily caused by a rise in risk costs at the onset of the global financial crisis and their strong improvement in 2016, as well as a continuous reduction of financial leverage. The negative contribution of a lower operating income margin and positive effects of an improved cost-income ratio roughly canceled each other out. We also provide a (cautious) medium-term outlook for the future development of the ROE of Austrian banking subsidiaries in CESEE, which is likely to depend on the balance between the weakened net interest income and reduced credit risk costs (that still have to prove their sustainability). When switching to a market perspective and the question of the subsidiaries' COE, we find that the latter is substantially lower than often assumed, but still too high to be fully compensated by realized profits (except in 2016). In aggregate, other CESEE peer banks fared better, which was mostly due to their higher profitability. These results call for continued and persistent efforts to further improve Austrian banking subsidiaries' risk-return profile in CESEE.

Published in *Financial Stability Report 33*.

Stephan Barisitz,
Mathias Lahnsteiner

Ukraine's banking sector: still very weak, but some signs of improvement

Ukraine has been undergoing a reform process, and the banking sector is certainly among the areas that have seen remarkable progress. The authorities started to tackle related-party lending (a long-standing structural impediment), resolved many undercapitalized banks and managed to restore a degree of confidence in the sector, as witnessed by the stabilization of deposits. As part of the banking sector clean-up, the country's largest credit institution was nationalized. This step contributed to considerable changes in the ownership structure, with the share of the state in total assets rising to about 50%. After the severe recession of 2014–

2015, macroeconomic stabilization achieved with international support in 2016, if sustained, could pave the way for a resumption of lending. Yet, nonperforming loans (NPLs) have skyrocketed, credit risk is still very high, related-party lending is still a problem, resistance to reform remains stubborn, and economic recovery is fragile, subject to political uncertainty. Further sound economic policies, progress with structural reforms (in particular with regard to the rule of law and corruption) and efforts to reduce NPLs appear essential to make a sustained banking recovery possible.

Published in *Financial Stability Report 33*.