# CE Watch: 20 years EU membership - Bond market integration

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The integration of the government bond markets of the CE/SEE NMS with the core markets in the EU is a milestone on the way to a more developed economy. While integration, as measured by price movements vis-à-vis the reference market, can be quickly reversed in times of crisis, the recent pandemic has shown that targeted policy measures can prevent renewed fragmentation. Within the Visegrád countries, the Czech Republic has a high degree of bond market integration, while high beta names such as Romania, but also Hungary, remain sensitive. On the other hand, as part of a quantity-based integration analysis, non-resident holdings have not changed too much since the euro area sovereign debt crisis due to the phenomenal home bias of investors.


In this note, we take a look at EU-wide financial market integration (FMI) with a focus on the convergence of the bond markets in the V4 countries in the two decades after EU entry.

**This is a 4th note devoted to the 20-year anniversary of Central European countries in the EU.** To read the previous ones, please click on the links below:


Wide Angle Shot: 20 years EU membership CE - Successes, reversals and twist

CE Watch: 20 years EU membership - the rise of trade

CE Watch: 20 years EU membership - the strengthening of labour markets


**Key points**

- First, we look at various measures of financial markets integration (FMI) provided by the ECB. There are two composite measures of FMI in the EU: a quantity-based indicator (incl. bond holdings) and a price-based indicator (incl. bond price developments) and various sub-indices, including the bond market integration index.

- The more volatile price-based composite indicator reached its peak just before the Great Financial Crisis (GFC) and its low during the euro sovereign crisis. It's impressive how past crises have reversed integration. As was well documented during the pandemic, policy responses can prevent fragmentation.

- We then place the development of the bond markets in the Central European (CE) New Member States (NMS), including Romania (for comparison purposes), in the above context and analyse the evolution of yields relative to the reference market:




**Stephan IMRE**
*Analyst Editor*
+43 1 71707-6757
stephan.imre@rbinternational.com

**Dorota STRAUCH**
*Analyst Editor*
+48 609 920 663
dorota.strauch@raiffeisen.pl






PLEASE NOTE THE RISK NOTIFICATIONS AND EXPLANATIONS AT THE END as expected, the correlation between CE/RO and Bund yields tends to break down significantly in times of crisis due to the safe-haven reflex.

- Nevertheless, our data showed an almost perfect correlation in some years until the recent period of high inflation / rates, which broke it again. From a long-term perspective, the CZGB market has shown the highest degree of integration, followed by POLGBs and SLOVGBs, while HGBs and ROMGBs have been the most volatile.

- Finally, we look at the data on non-resident holdings (NRHs), which show that this measure has not led to significant shifts compared to the years during the NMS' accession process. This is mainly due to a home bias (i.e. tendency to keep bonds in domestic hands), which intensified significantly after the European sovereign debt crisis, but, - in case of HU and PL - also due to active policies to limit NRHs.

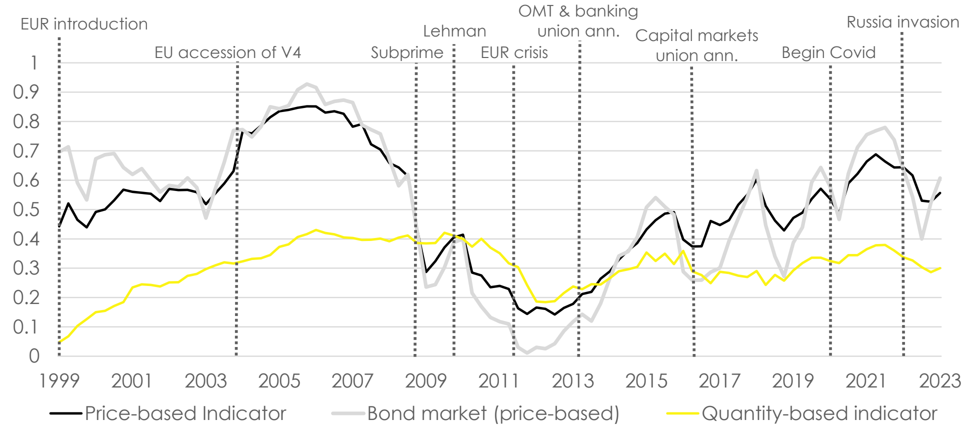
**ECB measures Financial Market Integration using quantity and price indicators**

From an economic perspective, **FMI mainly refers to the removal of cross-border barriers in financial markets**. Close links between financial markets allow risk diversification, smooth cross-border capital flows, foreign participation in domestic financial markets and the exchange of information between financial institutions and agents. To measure the extent of financial integration in the EU and the euro area (EA), the ECB publishes financial integration indicators. **There is a quantity-based and a price-based composite indicator**. The former covers cross-border bond holdings, equity holdings and interbank lending, while the latter measures cross-border price differentials through **four sub-indices** for the main financial markets, i.e. banking, money markets, **bonds** and equities.

**Bond markets play a crucial role in becoming a developed economy**

We would like to briefly clarify why we will focus on the bond markets (and on one of the four ECB price-based sub-indices of financial integration): Chaloupka (2012) highlights that government debt instruments play an essential role, especially in more advanced / developed economies. They serve as the **main source of financing for governments** and link issuers with long-term financing needs to investors willing to invest in long-term, interest-bearing securities. In addition, **central banks use short-term sovereign debt instruments** as a major instrument in the implementation of monetary policy. Government bonds also **serve as benchmarks** for the pricing of other securities, as they are considered to be the least risky assets. They **contribute to the formation of the overall credit curve** and also to the functioning of the financial system as they are often used as **collateral** in various financial market transactions. Government bonds are therefore an important asset in the portfolios of financial institutions and have also become a **popular retail product** in more and more EU countries during the past few years.

### Price- and quantity-based FMI composite indicators*



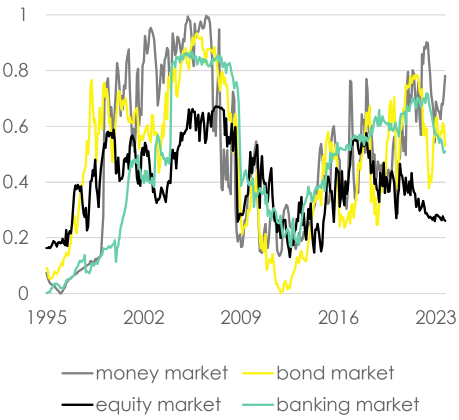

**price-based composite indicator aggregates ten indicators for money, bond, equity and retail banking markets. Quantity-based composite indicator aggregates five indicators for the same segments except retail banking. Bond market price-based sub-index captures cross-country standard deviations of two- and ten-year sovereign bond yields (excl. Greece), and cross-country standard deviation of bond yields of uncovered corporate bonds issued by non-financial corporations. Indicators bounded between zero (full fragmentation) and one (full integration). Quarterly data, latest data point: Q1-2023.*

*Source: ECB, RBI/Raiffeisen Research*

### Price-based measure highlights crisis sensitivity of financial market integration

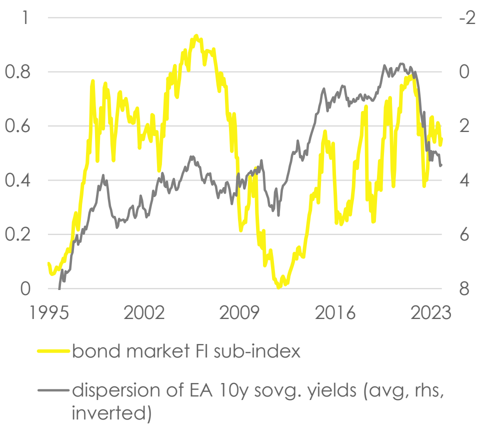
First, we take a long-term bird's-eye view of financial market integration at the EU level, to which the CE/SEE NMS and their government bond markets have gradually been integrated. As the ECB points out in its report on FMI (ECB, 2022), the price-based indicator suggests that the modest and volatile recovery of integration after the GFC and the European sovereign debt crisis was still intact. It can be seen that the **price indicator has been more volatile than the quantity-based indicator**, reaching a high just before the onset of the GFC and a low during the euro area sovereign debt crisis. The **bond market indicator** - a sub-index of the price indicator - is highly **correlated with the composite indicator**, while its ups and downs have been more pronounced. The first thing to note is that a very high degree of **bond market integration (pre-GFC) can be reversed very quickly** in the event of a crisis, even to the point of complete fragmentation (euro crisis). However, as Chart 1 further shows, **quantitative integration has moved broadly sideways since 2014**. We expect the recent recovery since early 2023 to have continued in the course of 2023 (beyond the latest available data point, i.e. Q1-2023). The main obstacle to quantitative bond market integration is the **"home bias" towards holding domestic financial assets**, which remains an important phenomenon in the EA, especially since the GFC.

### Chart 1 - Price-based sub-indices*




**money market: SD of weighted avg. of unsecured interbank o/n lending rates (ex GR, IE, AT, FI. Bond market: SD of 2y and 10y sovg. yields (ex GR), and SD of yields of uncovered bonds of NFCs. Equity market: segmentation index and absolute value of diff. between cross-sectional dispersions in sector and country index returns. Banking market: dispersion of interest*

### Chart 2 - Yield dispersion and bond market integration*




**low dispersion: well-integrated market as investors will not demand* *rates on new loans to households and NFCs, and dispersion of private sector deposit rates.*

*Source: ECB, RBI/Raiffeisen Research*

*as high a premium to compensate for the risk of idiosyncratic shocks; high dispersion: fragmented market. Yields of EE, GR, CY, LV, MT, SI, SK and HR excluded.*

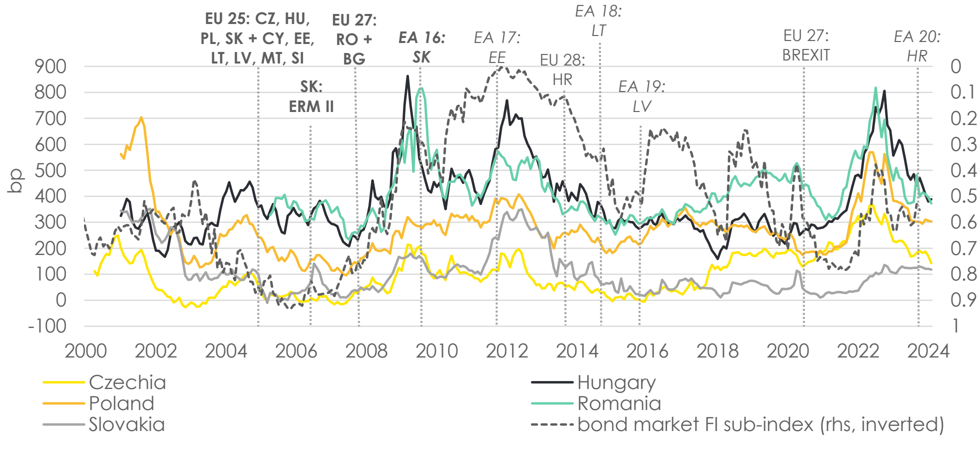
*Source: ECB, RBI/Raiffeisen Research*

**FMI** in the EU since the 2010s has been accompanied by crises, external threats, policies, trends, policy improvements and regulatory reforms, but it is **not only driven by crises**. Chart 2 shows that **until the GFC, integration dynamics were very strong in all four markets** and sub-indices respectively, with money market integration even reaching perfect integration, and the bond market lagging only slightly behind. Less pronounced fluctuations can be seen in the equity market, followed by the banking market.

### Successful policy interventions during the pandemic: lessons learned from GFC

To show that **policy measures can mitigate fragmentation tendencies in the bond market**, we highlight the measures taken during the pandemic: EA periphery spreads increased at the beginning of the pandemic, subsequently narrowed as financial conditions eased and then remained stable, benefiting from the Eurosystem's asset purchases, the joint financing of stimulus spending through the Support to mitigate Unemployment Risks in an Emergency (SURE), and NextGenerationEU (NGEU) programmes. Finally, the **recent disintegrative move was due to increased volatility** in an environment where monetary accommodation in the EA has been removed. This is also evidenced by the recent increase in bond yield dispersion, which we look at in the next section. In terms of the dispersion of 10y sovereign bond yields in the EU (chart 3), a falling trend could be observed following the GFC which is due to the moderating effect of QE and the low-rate environment. However, dispersion has spiked again against the backdrop of increased volatility in the wake of the latest rate hiking cycle, but we would expect the dispersion index to have moderated by now. **Dispersion should be lower in a well-integrated market**, as investors will not demand as high a premium to compensate for the risk of idiosyncratic shocks. However, it is striking that **bond market integration has only suffered disproportionately from this dispersion shock**, though. This is all the more remarkable given that , with the exception of the recent past, **market integration has always had a high beta to any changes in yield dispersion, except for recently**.

**High-beta 10y spreads and bond market integration***




**price-based bond market sub-index*

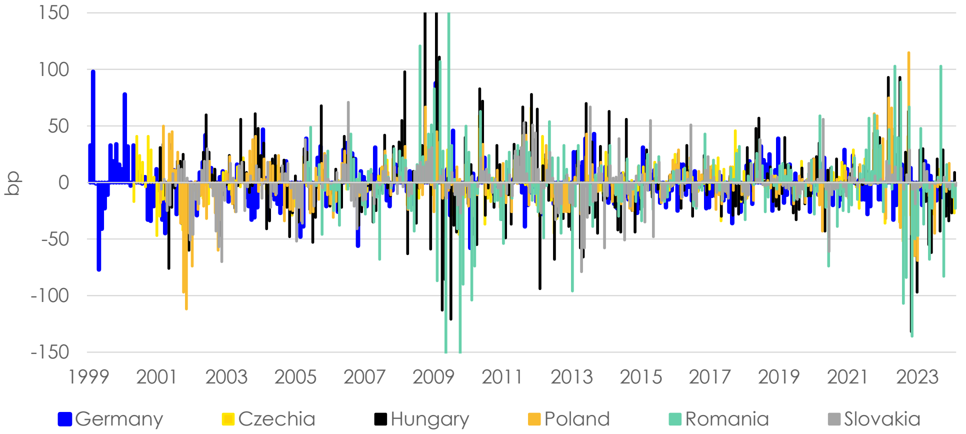
*Source: EC, ECB, RBI/Raiffeisen Research*

### High beta names in particular move strongly with the bond market index

In this section, we descend to the country level and focus on the integration of government bond markets in the EU, with an emphasis on the CE/SEE NMS. The countries at the centre of the analysis are the **Czech Republic (CZ), Hungary (HU), Poland (PL), Slovakia (SK) and Romania (RO)**. Charts below give an impression of the evolution of bond markets and spreads compared to the EU bond market integration indicator (price-based). Given our findings above, it is not surprising that there is a **strong co-movement of the high-beta CE/SEE government bond markets with the bond**

**market integration index**, which - as we concluded above - tends to be sensitive to yield dispersion.

### 10y spread chg vs DE: RO and HU with biggest swings*



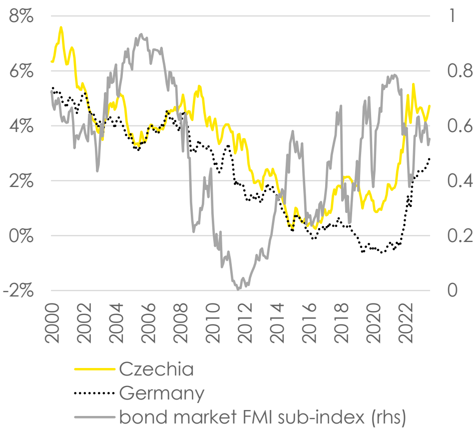

*monthly data

*Source: EC, RBI/Raiffeisen Research*

### Divergent correlation path disrupted by recent episode of high inflation / rates

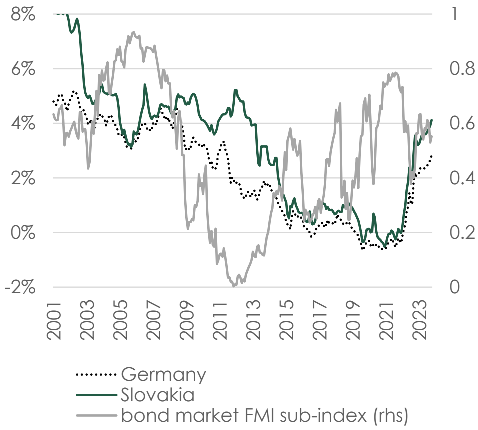
We now analyse the correlation of 10-year bond yields in the CE/SEE countries with the German benchmark over time. A **strong correlation indicates a high degree of synchronisation of economic and financial (mostly interest rate) cycles**. In times of crisis, there can be abrupt fragmentation due to contrasting yield movements amidst the usual safe-haven flow patterns.

### 10y CZGB vs. Bund yields and integration




*Source: EC, ECB RBI/Raiffeisen Research*

### 10y SLOVGB vs Bund yields and integration

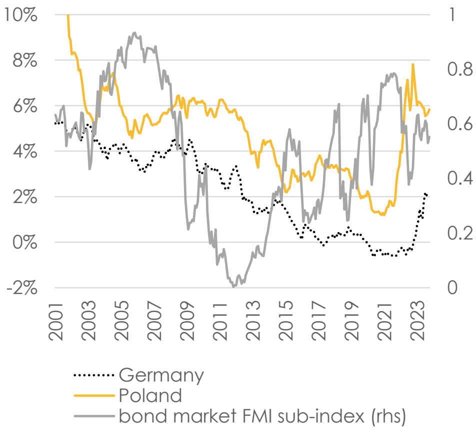



*Source: EC, ECB, RBI/Raiffeisen Research*

In the **run-up to EU accession** (RO joined the EU on 1 Jan 2007, the others on 1 May 2004), the 10y yields of **CZGB, SLOVGB and POLGB were the most correlated** with the German benchmark (the first two > 80%, PL: almost 80%). At the other end of the spectrum, the **Hungarian 10Y yield was the least synchronised** (38%), followed by Romania (38%).

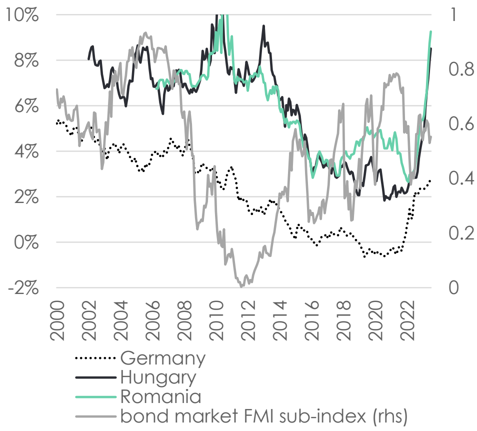
In the subsequent period **up to the onset of the GFC**, i.e. between EU accession and the GFC (end-2007), the yield correlation declined only marginally in **CZ** and **SK**, while it fell significantly to around 50% in **Poland** and even broke down completely in **Romania** (but note that in the latter case the observation period is only one year, i.e. 2007). Somewhat surprisingly, the co-movement of the 10-year **HGB** with the German counterpart increased somewhat (to ~40%) over the observation period, albeit from a very low level.

**10y POLGB vs Bund yields and integration**




*Source: EC, ECB, RBI/Raiffeisen Research*

**10y HGB and ROMGB yields and integration**

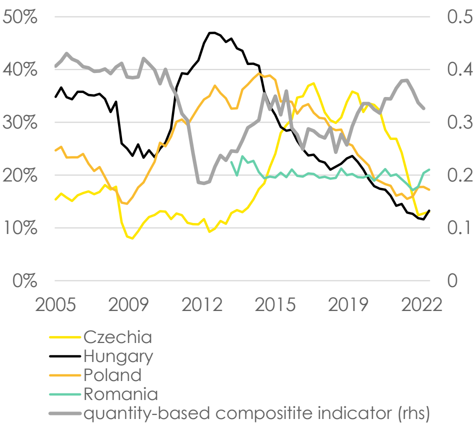



*Source: EC, ECB, RBI/Raiffeisen Research*

**During the GFC and the peak of the euro crisis** (until the end of 2012), the correlation between **CZGB** and Bund remained **stable** at high levels, while that of **Poland** even increased, mainly due to the outstanding economic resilience of the Polish economy during these crisis episodes. **Hungary**, which was more vulnerable due to its idiosyncratic risks (double deficit crisis, IMF bailout 2008), also faced significant fragmentation. Somewhat surprisingly, **Slovakia's** bond market correlation also fell due to idiosyncratic risk, overweighting its euro adoption (plans) over the same period. Finally, **Romania's** EU membership has now borne its long-awaited fruit, reflected in a 42% correlation.

In the next period, i.e. **from the peak of the EUR crisis to the pandemic**, the formerly most integrated **Czech** market lost its pole position in terms of correlation, falling to ~50% in the 2013 – 2020 period. At the same time, **Slovakia**, **Hungary**, and **Poland** became the most correlated markets. Finally, **Romania** improved its coefficient to almost 60% over the same period. Then, **during the pandemic** (until end-2022) we have seen the **most synchronised period with all our CE/SEE markets here reaching almost perfect correlation** with the benchmark market. Due to the different, i.e. earlier and more pronounced rate hiking cycle vs the euro area, **since then only SK maintained its perfect correlation**, while the others fell back significantly to levels between 40% (PL) and 60% (CZ). ROMGBs, finally, got almost completely fragmentated again.

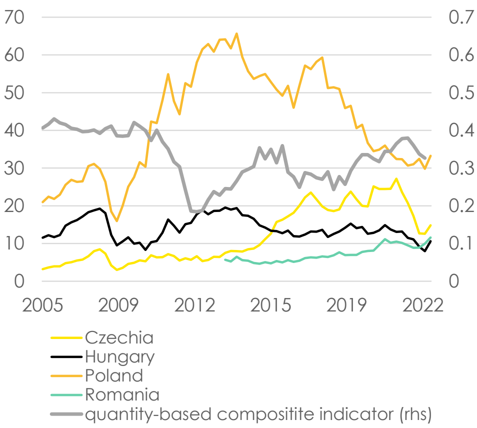
**CE/RO NRHs (%) vs quantity-based indicator***




**non-resident holdings (NRHs) as % a share of total LCY bonds outstanding.*

*Source: BIS, RBI/Raiffeisen Research*

**CE/RO NRHs (USD bn) vs quantity-based indicator***




**non-resident holdings in USD bn in total LCY bonds outstanding*

*Source: BIS, RBI/Raiffeisen Research*

**Non-resident holdings: home bias and anti-NRH policies in HU and PL**

In the final section, we look at **non-resident holdings (NRHs) of CE/RO government bonds** as part of a quantity-based analysis. **Between the EU accession** of the CE-3 markets **and the GFC**, the percentage **share of non-resident holdings (NRH) in total local currency bond outstanding declines** in line with the quantity-based composite indicator (chart10). This is mainly due to increased debt accumulation in the new NMS and, as shown in chart 11, the total **volume of NRH increases** over the same period. The **quantitative composite indicator** - which covers cross-border bond holdings, equity holdings and interbank lending - then **falls sharply**, reaching its low at the height of the euro crisis. While the **NRHs in CZGBs more or less follows** this broader move, the **NRHs in HGBs and POLGBS rises sharply** both in terms of volume and share. This can be explained by massive buying by non-resident investors, who stepped in instead of resident investors and were eventually rewarded with high returns. With the recovery and subsequent further strengthening of the local banking sectors and, as mentioned above, the **phenomenon of home bias in bond holdings since the GFC**, the NRHs in HGBs and POLGBs in particular has declined significantly. In addition, both countries have **actively sought to reduce the NRHs** in their bond holdings and have actively incentivised attempts to reduce the NR share through various measures (e.g. the development of the HGB retail market). We conclude that the volume of NRHs in all markets is only slightly higher than at the start of our time series (2005). At the same time, the % share is lower only in Hungary, while it is more or less stable in all other markets.

**Appendix: References**


- J. Chaloupka, "Government Bond Market Integration of New EU Member States", International Journal of Trade, Economics and Finance, Vol. 3, No. 6, December 2012

- ECB Committee on Financial Integration, "Financial Integration and Structure in the Euro Area", April 2022

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Thomas SternbachLegal and ComplianceRaiffeisen Bank International AGAm Stadtpark 9, 1030 WienTel: +43-1-71707-1541Fax: +43-1-71707-761541thomas.sternbach@rbinternational.com

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### BENEDIKT-LUKA ANTIC
Austria ,
benedikt-luka.antic@rbinternational.com

### JÖRG BAYER
Austria ,
joerg.bayer@rbinternational.com

### FABIAN BLASCH
Austria ,
fabian.blasch@rbinternational.com

### GUNTER DEUBER
Austria ,
gunter.deuber@rbinternational.com

### CASPER ENGELEN
Austria ,
casper.engelen@rbinternational.com

### RUSLAN GADEEV
Austria ,
ruslan.gadeev@rbinternational.com

### AMADEA HIESS
Austria ,
amadea.hiess@rbinternational.com

### STEPHAN IMRE
Austria ,
stephan.imre@rbinternational.com

### MARTIN KUTNY
Austria ,
martin.kutny@rbinternational.com

### FABIAN LAMINGER
Austria ,
fabian.laminger@rbinternational.com

### THOMAS LEIRER
Austria ,
thomas.leirer@rbinternational.com

### OLIVER MARX
Austria ,
oliver.marx@rbinternational.com

### MATTHIAS REITH
Austria ,
matthias.reith@rbinternational.com

### WERNER SCHMITZER
Austria ,
werner.schmitzer@rbinternational.com

### GOTTFRIED STEINDL
Austria ,
gottfried.steindl@rbinternational.com

### MARKUS TSCHAPECK
Austria ,
markus.tschapeck@rbinternational.com

### JÜRGEN WALTER
Austria ,
juergen.walter@rbinternational.com

### GEORG ZACCARIA
Austria ,
georg.zaccaria@rbinternational.com

### FRANZ ZOBL
Austria ,
franz.zobl@rbinternational.com

### BRISIDA BUZI
Albania ,
Brisida.BUZI@raiffeisen.al

### VALBONA GJEKA
Albania ,
valbona.gjeka@raiffeisen.al

### FJORENT RRUSHI
Albania ,
Fjorent.Rrushi@raiffeisen.al

### ARISTEA VLLAHU
Albania ,
Aristea.Vllahu@raiffeisen.al

### OLGA ZHEGULO
Belarus ,
olga.zhegulo@priorbank.by

### ASJA GRDJO
Bosnia Herzegovina ,
asja.grdjo@raiffeisengroup.ba

### IVONA ZAMETICA
Bosnia Herzegovina ,
ivona.zametica@raiffeisengroup.ba

### MIRZA ZORNIC
Bosnia Herzegovina ,
mirza.zornic@raiffeisengroup.ba

### ELIZABETA SABOLEK-RESANOVIC
Croatia ,
elizabeta.sabolek-resanovic@rba.hr

### ZRINKA ZIVKOVIC-MATIJEVIC
Croatia ,
zrinka.zivkovic-matijevic@rba.hr

### HELENA HORSKA
Czech Republic ,
Helena.Horska@rb.cz

### LEVENTE BLAHÓ
Hungary ,
levente.blaho@raiffeisen.hu

### GERGELY PÁLFFY
Hungary ,
gergely.palffy@raiffeisen.hu

### ZOLTÁN TÖRÖK
Hungary ,
torok.zoltan@raiffeisen.hu

### DOROTA STRAUCH
Poland ,
dorota.strauch@raiffeisen.pl

### NICOLAE COVRIG
Romania ,
Nicolae.Covrig@raiffeisen.ro

### ANDREEA-ELENA DRAGHIA
Romania ,
Andreea-Elena.DRAGHIA@raiffeisen.ro

### IONUT DUMITRU
Romania ,
Ionut.Dumitru@raiffeisen.ro

### ANASTASIA BAYKOVA
Russia ,
ABAIKOVA@raiffeisen.ru

### GREGORY CHEPKOV
Russia ,
grigory.chepkov@raiffeisen.ru

### STANISLAV MURASHOV
Russia ,
stanislav.murashov@raiffeisen.ru

### LJILJANA GRUBIC
Serbia ,
ljiljana.grubic@raiffeisenbank.rs

### TIBOR LORINCZ
Slovakia ,
tibor_lorincz@tatrabanka.sk

### SERHII KOLODII
Ukraine ,
serhii.kolodii@raiffeisen.ua

### OLEKSANDR PECHERYTSYN
Ukraine ,
oleksandr.pecherytsyn@raiffeisen.ua


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**Raiffeisen Bank International AG**Registered Office: Am Stadtpark 9, 1030 ViennaPostal address: 1010 Vienna, Postfach 50Phone: +43-1-71707-1846Fax: +43-1-71707-1848

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