



REPUBLIC OF CROATIA

SELECTED ISSUES

July 2024

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June 26, 2024

Approved By
European Department

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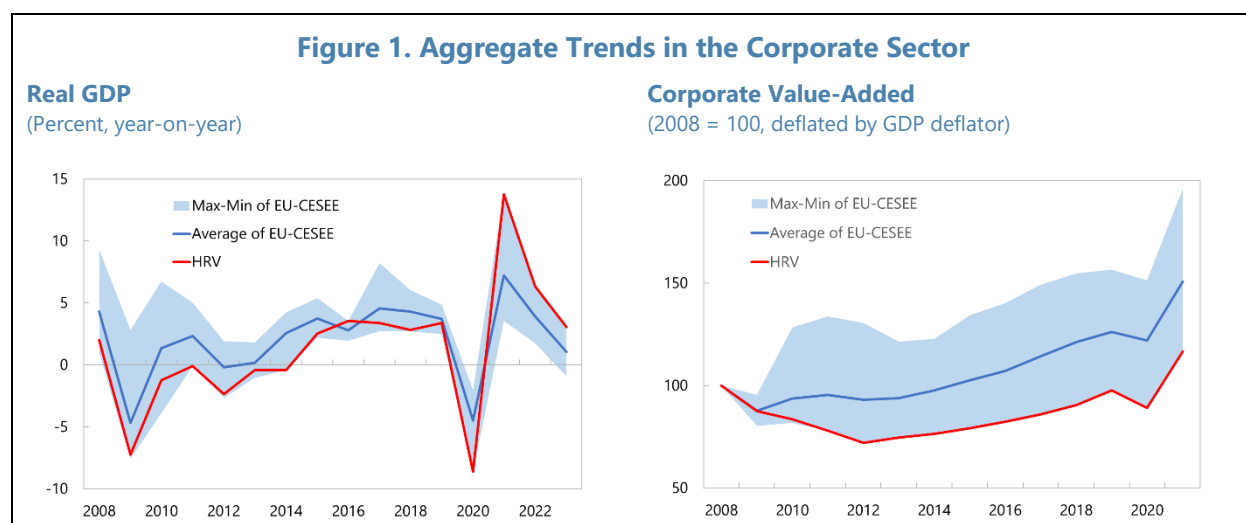
CORPORATE SECTOR BALANCE SHEET

VULNERABILITIES IN CROATIA¹

Croatian firms have significantly improved their balance sheets since the prolonged recession after the Global Financial Crisis, helped by deleveraging and narrowing country risk premium as Croatia advanced its euro adoption agenda. Micro-level simulations confirm the resilience of the corporate sector against adverse shocks to profitability and financing costs. The well-capitalized banking sector overall is also found to have buffers to absorb negative spillovers from the corporate sector.

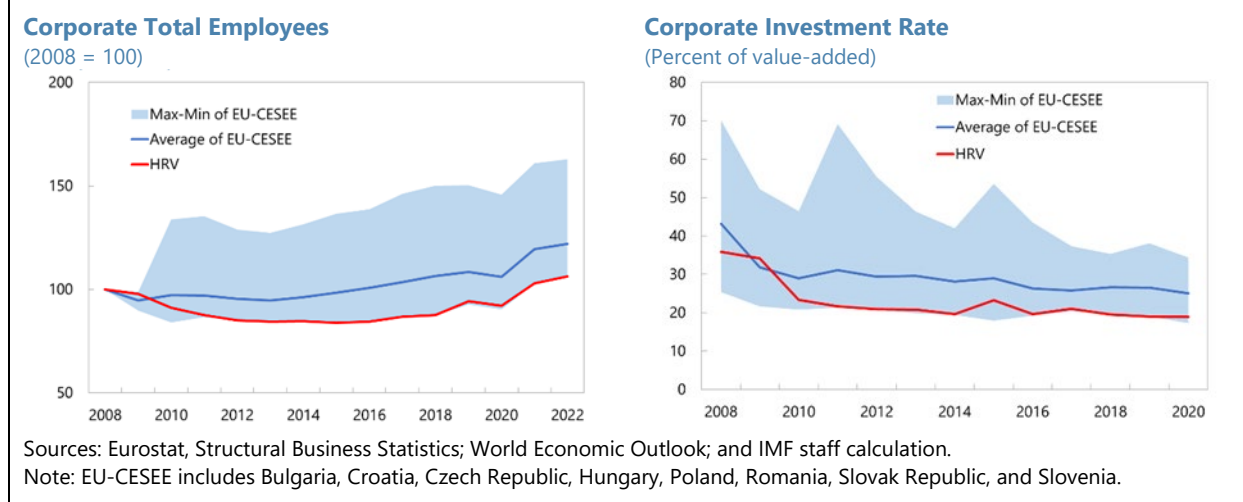
A. Introduction

1. Croatia's corporate sector suffered from the prolonged recession after the Global Financial Crisis (GFC) and has not recovered as strongly as the corporate sector in its peers (Figure 1). Both its value-added and number of employees declined and remained below their respective 2008 levels until the strong post-pandemic rebound. This is in contrast to its peers whose corporate sectors have significantly expanded over the past decade, measured by either value-added or employment. The modest growth performance of Croatia's corporate sector is accompanied by subdued investment activities, with the investment to value-added ratio dropping and stabilizing at the decade low of 20 percent, 7 percentage points below the average of other Central, Eastern and South-Eastern European (CESEE) member states of the European Union (EU).



¹ Prepared by Wei Shi. The author is grateful to Xuege Zhang for compiling the Orbis dataset for Croatia, and to the Corporate Analytical Group of EUR at the IMF for their comments. The paper has also benefited from insightful comments and discussions provided by the Croatian authorities.

Figure 1. Aggregate Trends in the Corporate Sector (Concluded)



2. At the same time, non-financial corporations (NFCs) have managed to deleverage and improved their creditworthiness (Figure 2). The gross debt of NFCs plateaued at almost 100 percent of GDP during the recession but declined subsequently; it stood at 77 percent of GDP in 2022, slightly below the EU median. The past decade also witnessed improved asset quality of corporate loans—the ratio of non-performing loans (NPLs) to total corporate loans declined to single digits in all sectors—and a gradual shift in NFCs’ financing pattern. As in other European economies, NFCs in Croatia barely rely on debt securities, but rather on loans and equity. The relative importance of equity financing has been on the rise in recent years and with more active participation of non-bank financial institutions. During the same period, NFCs have reduced the share of loans provided by both banks and nonbanks in their total debt, and instead increasingly resorted to each other for credits. Intercompany loans make up more than half of the overall NFC debt in 2022, compared to around 35 percent in 2013.

Figure 2. Liabilities of the Non-Financial Corporate Sector

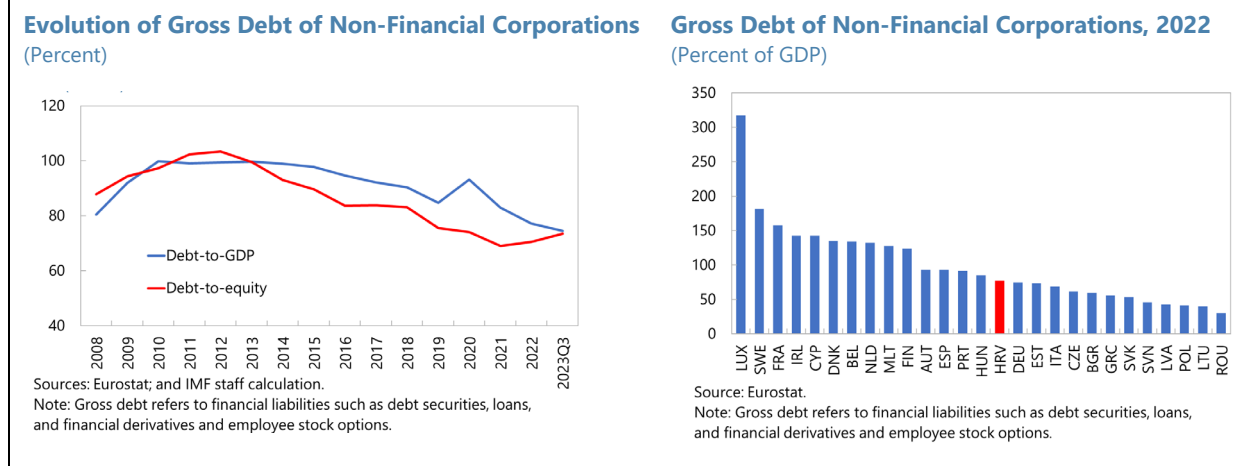
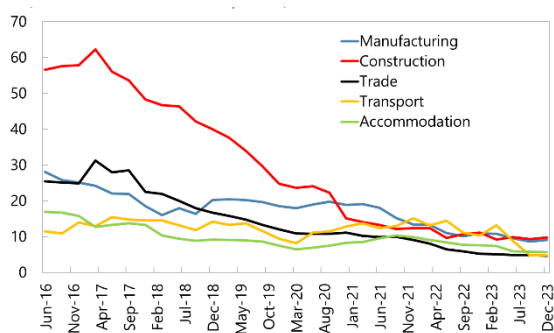


Figure 2. Liabilities of the Non-Financial Corporate Sector (Concluded)

Non-Performing Loans

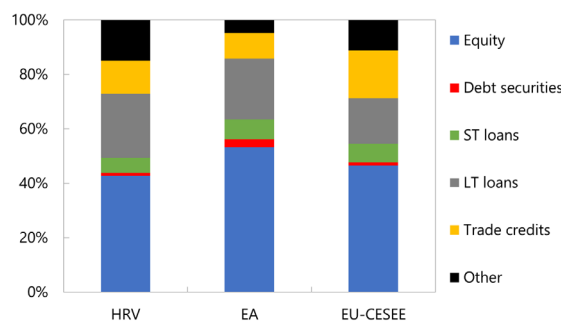
(Percent of total sectoral exposure)



Source: Croatian National Bank.

Non-Financial Corporations' Liability Structure, 2022

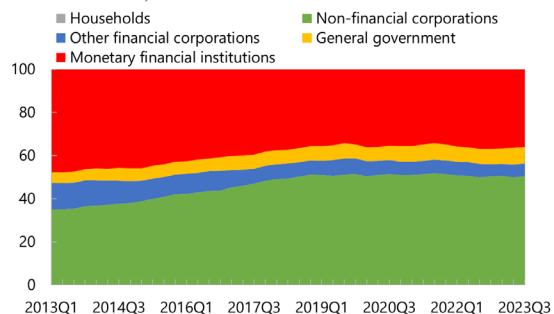
(Percent)



Sources: Croatian National Bank; and IMF staff calculation. Note: Data for Croatia have been excluded from group averages.

Counterparts of Debt of NFCs

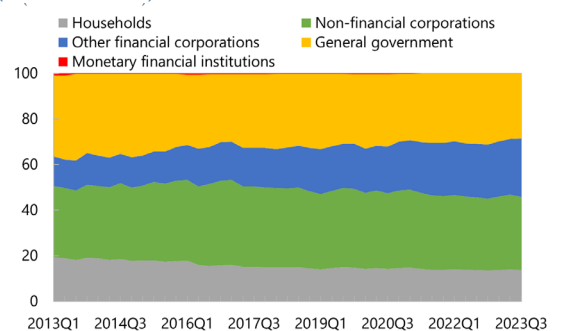
(Percent of total)



Sources: Eurostat; and IMF staff calculation. Note: Debt refers to debt securities and loans.

Counterparts of Listed Shares of NFCs

(Percent of total)



Sources: Eurostat; and IMF staff calculation.

3. This paper delves into firm-level data to gauge balance sheet vulnerabilities of the NFC sector and implications for banks and financial stability. It serves as a background analysis to the systemic risk assessment presented in the staff report and follows established approaches to stress-test the corporate sector. We briefly discuss the micro data—the Orbis database of the Bureau van Dijk—and how well they represent Croatia’s NFC sector in Section B,² followed by a presentation of trends in leverage, profitability, liquidity coverage, and default risks of NFCs. Section C stress-tests the NFCs with shocks to their profitability and borrowing costs, guided by methodologies outlined in the 2013 October Global Financial Stability Report (GFSR) and Klein (2016). We defer technical issues regarding Orbis data cleaning and the handling of missing observations to the data appendix. While the focus of this paper is exclusively on NFCs’ balance sheet vulnerability, a related analysis based on the same data (Annex V of the Staff Report) examines firm-level productivity and its obstacles.

² The latest Orbis data refer to 2021 as very few firms have reported their 2022 results so far.

B. Evolution of NFC Balance Sheet Strength

Orbis Data Representativeness

4. **The Orbis database offers a reasonably good picture of Croatia's NFC sector in terms of value-added but tends to underrepresent the role of micro and small firms.** Table 1 presents a comparison of the overall coverage and distributions with respect to major private sector industries and firm size between the Orbis data and the Eurostat's Structural Business Statistics (SBS) for 2021.³ Orbis data miss a large number of micro firms, but the gap becomes much smaller if we instead measure Orbis firms' representativeness by value-added or employment. For selected industries, the Orbis sample in most cases covers at least 70 percent of the value-added and employment. Nonetheless, micro firms in Orbis are under-sampled and account for a smaller share of total value-added and an even smaller share of employment than in SBS. As a robust check for this under-sampling, we re-weight firms to align their relative employment shares by firm-size groups to those implied by SBS when calculating the overall corporate defaults in the sensitivity analysis.

	Number of Enterprises (Percent of Total)										
	Micro		Small		Medium-sized		Large		Total (Count)		
	Orbis	SBS	Orbis	SBS	Orbis	SBS	Orbis	SBS	Orbis	SBS	Orbis/SBS
Manufacturing (C)	54.6	84.7	34.2	12.0	9.1	2.7	2.1	0.6	6,456	23,152	28%
Construction (F)	66.7	90.5	28.9	8.3	4.1	1.1	0.3	0.1	5,713	26,678	21%
Trade (G)	75.0	92.1	21.2	6.6	2.8	1.0	1.0	0.3	8,412	35,754	24%
Transport (H)	68.9	93.0	25.2	5.9	4.5	0.9	1.3	0.2	2,025	13,228	15%
Accommodation, Food (I)	69.4	92.2	27.6	7.2	2.6	0.5	0.4	0.1	3,542	21,101	17%
ICT (K)	74.8	94.6	21.0	4.6	3.5	0.7	0.6	0.2	2,222	13,108	17%
	Value-added (Percent of Total)										
	Micro		Small		Medium-sized		Large		Total (€ mln.)		
	Orbis	SBS	Orbis	SBS	Orbis	SBS	Orbis	SBS	Orbis	SBS	Orbis/SBS
Manufacturing (C)	6.9	8.8	17.5	16.3	28.0	23.4	47.6	51.5	5,693	6,955	82%
Construction (F)	20.4	27.4	31.0	32.5	26.9	26.5	21.7	13.6	1,925	2,519	76%
Trade (G)	14.8	20.4	19.5	22.8	14.6	16.8	51.1	40.0	5,429	6,102	89%
Transport (H)	10.4	17.7	19.1	22.3	16.6	20.8	54.0	39.2	1,550	1,851	84%
Accommodation, Food (I)	15.7	24.9	23.9	21.5	20.5	15.1	39.9	38.6	1,297	1,810	72%
ICT (K)	9.9	15.9	16.7	17.0	14.9	14.9	58.6	52.1	2,184	2,568	85%
	Number of Employees (Percent of Total)										
	Micro		Small		Medium-sized		Large		Total (Count)		
	Orbis	SBS	Orbis	SBS	Orbis	SBS	Orbis	SBS	Orbis	SBS	Orbis/SBS
Manufacturing (C)	10.1	16.6	21.3	20.6	28.2	23.5	40.4	39.3	225,600	270,764	83%
Construction (F)	28.3	40.6	36.6	31.0	23.6	19.8	11.5	8.7	93,540	134,352	70%
Trade (G)	20.1	29.0	18.2	18.2	13.1	14.4	48.5	38.3	186,704	242,631	77%
Transport (H)	14.7	32.1	17.0	19.7	15.4	16.0	52.9	32.2	60,655	74,275	82%
Accommodation, Food (I)	30.0	48.6	31.4	23.6	15.9	10.6	22.6	17.2	59,279	107,023	55%
ICT (K)	14.6	32.4	19.2	20.1	16.3	16.4	49.9	31.1	50,326	57,833	87%

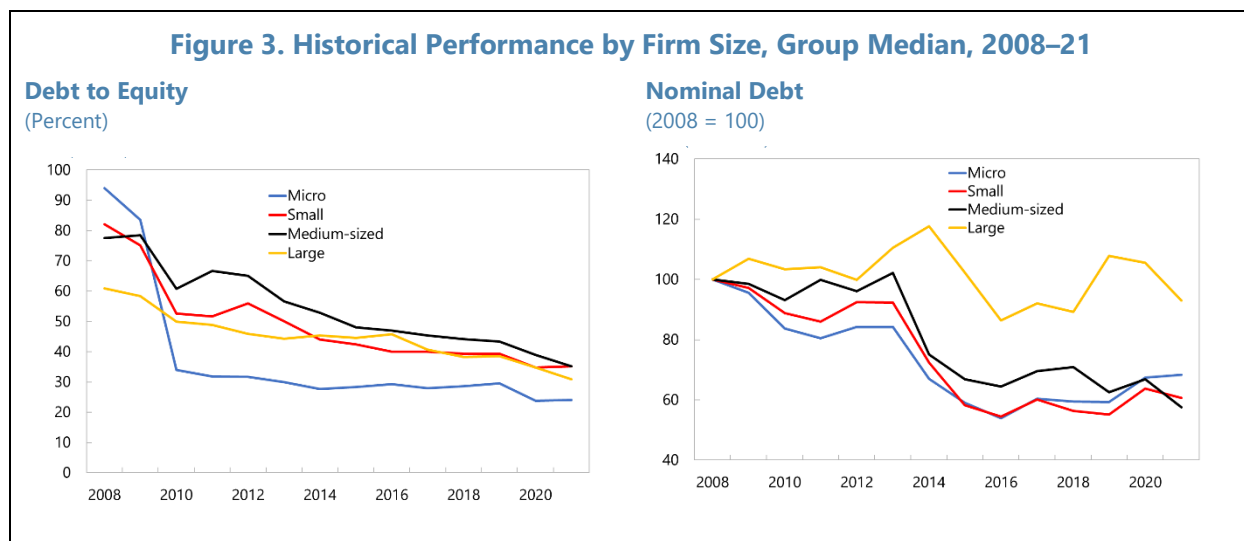
Sources: Orbis; Eurostat, Structural Business Statistics; World Economic Outlook; and IMF staff calculation.
 Note: Enterprises with 1-9 employees are classified as micro, 10-49 employees as small, 50-249 employees as medium-sized, and over 250 employees as large. ICT stands for information and communications technology.

³ The Orbis data were downloaded on January 19, 2024. Following the convention of official statistics, we define the firm size by the number of employees, with micro firms having 1 to 9 employees, small firms having 10 to 49 employees, the medium-sized firms having 50 to 249 employees, and large firms having at least 250 employees. Industries are defined according to [NACE Rev. 2](#). The Orbis data have been retrieved in U.S. dollars and converted to euros using the average annual nominal exchange rate U.S. dollar per euro from the World Economic Outlook database.

Improved NFC Balance Sheets

5. Croatia's NFCs underwent significant deleveraging since the GFC. Debt-to-equity ratios declined across firm sizes (Figure 3) and sectors (Appendix) since 2008, reflecting both decreasing indebtedness relative to assets and a gradual buildup of equity. Small and medium-sized enterprises (SMEs) especially cut their nominal debt aggressively and the median firm within each size group held 30–40 percent less debt in 2021 compared with 2008. Debt of large firms, on the other hand, experienced a temporary rise around mid-2010s and ended up at roughly the same level in 2021 as in 2008.

6. Coupled with declining borrowing costs, the lower leverage brought broad-based improvements in NFCs' financial strength. The effective interest rates facing firms fell to about half of their 2008 levels in 2021. Lower borrowing costs helped to boost firms' interest coverage ratios (ICRs),⁴ which rose steadily since 2008 except for the temporary disruption caused by the COVID-19 pandemic. Corporate profitability also recovered after a temporary dip around 2008–09. In line with the improved financial strength of the corporate sector, the estimated risk of default declined over the past decade, as indicated by better Altman Z-Scores (see the note below Figure 3). Small firms outperformed other groups in terms of lower estimated default risks given their more favorable track record of realized earnings before interest and taxes (EBIT) and higher working capital buffers, though they had less equity and lower sales to assets compared with large firms.

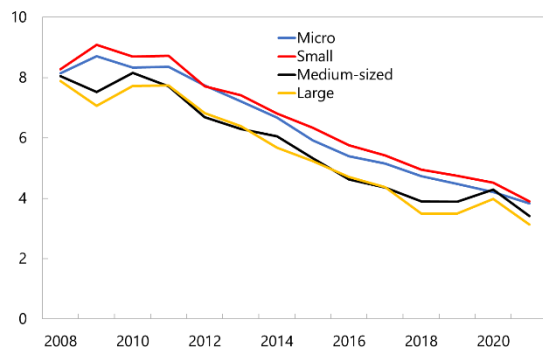


⁴ The ICR is calculated using earnings before interest, taxes, depreciation, and amortization (EBITDA), more properly termed the EBITDA-interest coverage ratio in the literature.

Figure 3. Historical Performance by Firm Size, Group Median, 2008–21 (Concluded)

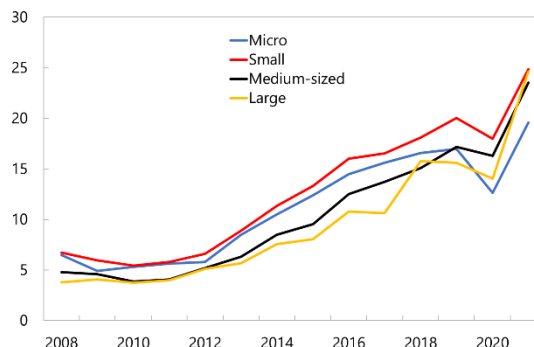
Effective Interest Rates by Firm Size

(Percent)



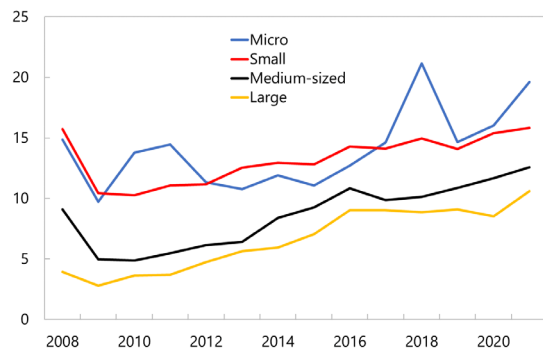
Interest Coverage Ratio

(Calculated using EBITDA)



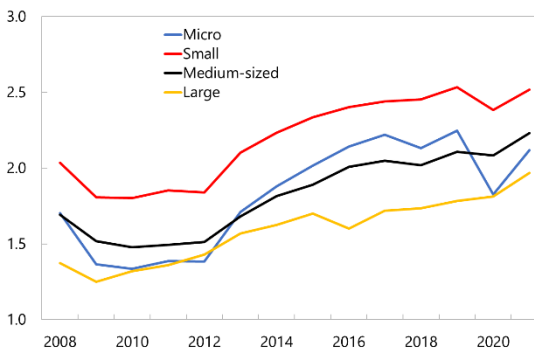
Return to Equity

(Percent)



Altman Z-Score

(Higher value suggests lower risk of default)

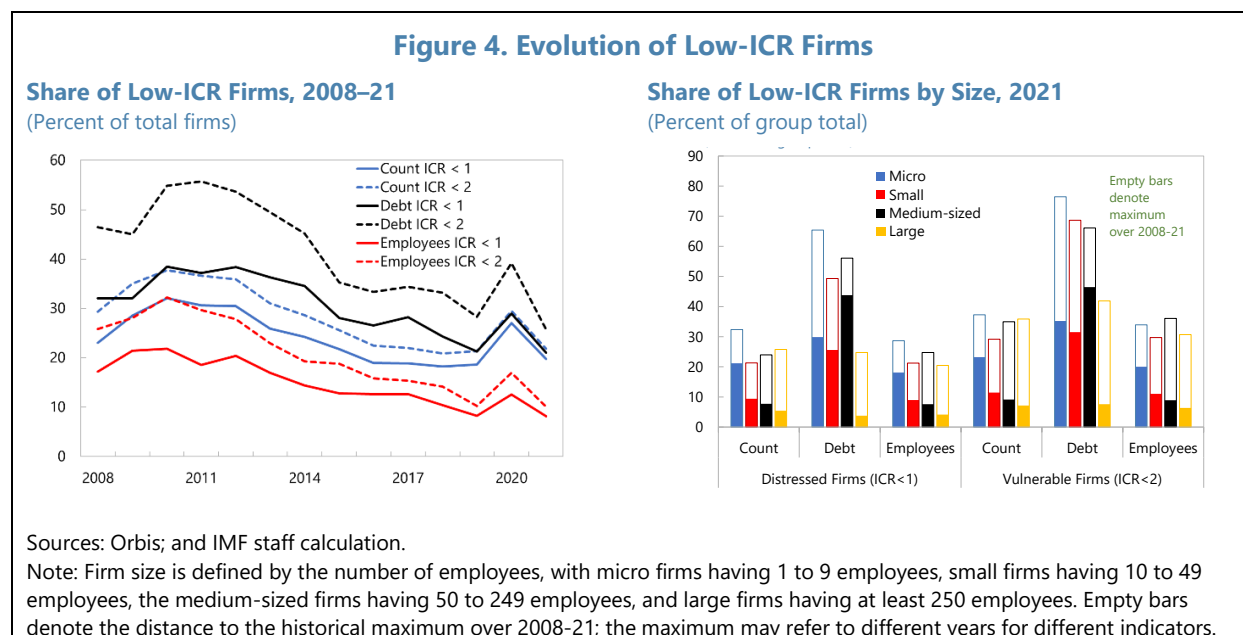


Sources: Orbis; and IMF staff calculation.

Note: Firm size is defined by the number of employees, with micro firms having 1 to 9 employees, small firms having 10 to 49 employees, the medium-sized firms having 50 to 249 employees, and large firms having at least 250 employees. The Altman Z-Score is calculated using the updated coefficients estimated with the ratio of the book value of equity to the book value of total liabilities. See Altman and others (2014). The median Z-Score calculated with the original coefficients is in general larger (indicating lower default probability) but displays similar trends across sectors and over time.

7. The positive development in the corporate balance sheet strength also manifested in the shrinking share of firms with low ICR (Figure 4). An ICR below 1 signifies that a firm does not generate enough profits to service its debt and thus is technically in financial distress. Firms with ICRs below 2 have some buffers after debt service obligations but the buffers could be relatively easily exhausted by adverse shocks, so these firms are of elevated vulnerability. In Croatia, though the shares of the distressed or vulnerable firms stood at comparable levels in 2021 and 2008, they accounted for much smaller shares in overall debt and employment in 2021. The improvement was more pronounced for employment. Employment at risk, i.e., the share of employment in firms with ICR less than 2, was lowered to a single digit in 2021 from the peak of 30 percent for all groups except micro firms. Similarly, a significant improvement was observed for debt held by large firms, but debt at risk remained elevated for other firms, especially medium-sized ones.

8. In sum, the NFC sector weathered well the COVID-19 pandemic and risks seemed contained as of 2021. Though debt at risks remained elevated in SMEs, the ongoing deleveraging contributed to reduced total exposures and helped limit aggregate risks. To scrutinize the resilience of the NFC sector and assess potential spillovers to banks, we will turn to simulated results to examine how firms would react to shocks to their profitability and borrowing costs in the next section.



C. Sensitivity Analysis to Gauge NFC Resilience

9. This section investigates the resilience of the NFC sector to major shocks and potential spillovers to banks. We focus on the 2021 subsample of Orbis firms (Table 2). These have recovered and resumed their pre-pandemic trends for most financial variables, as seen in the previous section. The shocks under considerations are of two types: a negative shock to firms' gross value-added, and a positive shock to firms' borrowing costs.

Table 2. Croatia: Summary Statistics of Orbis Firms, 2021

	Micro	Small	Medium-Sized	Large
Number of Firms	22,844	8,251	1,658	376
Group Median				
Value-Added (thousand euro)	51	321	1,996	13,553
Number of employees	3	17	84	459
EBITDA (thousand euro)	16	103	688	4,808
Interest (thousand euro)	1	5	27	222
Debt (thousand euro)	27	115	849	6,854

Sources: Orbis; and IMF staff calculation.
 Note: Enterprises with 1-9 employees are classified as micro, 10-49 employees as small, 50-249 employees as medium-sized, and over 250 employees as large.

10. The calibration of shocks follows the macro-financial scenarios of the 2023 EU-wide banking sector stress tests by the European Banking Authority (EBA). The EBA scenarios use 2022 as the starting point and consider a baseline scenario (in line with the December 2022 projection round by the European Central Bank and national central banks) and an adverse scenario over a three-year horizon (2023-25). The shock to sector-specific gross value-added (GVA) is taken as the cumulative difference at end-2025 between the adverse and the baseline scenarios, which ranges from -8.6 percent in accommodation and food and beverage services (I) to -15.7 percent in electricity, gas, steam, and air conditioning supply (D).⁵ The shock to firms' effective interest rates is assumed to be 305 basis points, corresponding to the difference of average long-term interest rates in the adverse and the baseline scenarios.

11. We consider separately shocks to GVA, interest rates, and a combined shock. Under the assumption that labor adjusts gradually and thus firms face rigid costs of employees over the horizon examined by the sensitivity analysis, a negative shock to GVA is fully born by reduced earnings (EBITDA and also EBIT assuming that depreciation and amortization stay the same).⁶ As detailed information on firms' debt maturity structure is not available in Orbis, we assume that the interest rate shock would affect uniformly all the firms and raise their cost of financing for 50 percent of their outstanding debt. This will cover the rollover needs of short-term debt—aggregate data suggest that 23 percent of NFC debt is short-term as of 2023Q3—and additional financing needs from maturing long-term debt. We also consider the possibility that higher interest rates increase firms' interest income from the financial assets they hold, which would mitigate firms' interest burden. The results will be presented as robustness checks.

12. Both shocks to GVA and interest rates raise corporate sector vulnerability with a combined shock increasing the share of firms with ICR<2 and debt held by them by around 15 percentage points (Table 3). Negative GVA shocks reveal that about 10 percent of firms in each size group have just enough earnings to meet debt service obligation and could be in distress if such shocks materialize. However, these firms, especially smaller ones, are relatively lightly indebted, resulting in a smaller increase in debt in distressed firms than their count. Positive interest rate shocks, in contrast, affect a small group of highly indebted firms. The share of distressed firms would rise by about 1 percentage point, but the rise of debt is much more pronounced at 8 percentage points for all firms and as high as 11 percentage points for large ones. As expected, the combined adverse shocks to GVA and interest rates will lead to significant increases in both firms and debt in distress, putting both back to where they were in the early 2010s.

⁵ The EBA 2023 stress test scenarios divide the manufacturing sector into two subsectors with low and high energy intensity, separately. We calibrate the gross value-added shock to manufacturing using the low-energy-intensity difference between the adverse and the baseline (-13.0 percent), instead of the high-energy-intensity one (-19.1 percent). Given Croatia's service-oriented economy, the more negative shock to manufacturing only results in a modest increase in the simulated new corporate defaults (by 0.1-0.2 percentage points).

⁶ This could overstate the actual impact on corporate earnings because the variable costs of production are likely to be lower when corporates face negative shocks to their GVAs.

Table 3. Croatia: Corporate Sector Sensitivity Analysis
(Share of respective firm groups, percentage point difference from 2021)

	Share of firms		Share of debt	
	ICR < 1	ICR < 2	ICR < 1	ICR < 2
Shocks to GVA				
All firms	9.7	11.2	4.8	4.9
of which:				
Micro	9.8	11.1	3.2	3.8
Small	12.9	14.9	5.2	5.9
Medium-sized	11.8	13.6	4.9	6.7
Large	8.0	9.8	6.1	5.3
Shocks to interest rates				
All firms	1.2	2.3	8.3	9.2
of which:				
Micro	0.8	1.8	9.7	14.5
Small	0.4	0.7	2.8	5.3
Medium-sized	0.3	0.7	5.5	7.5
Large	0.5	0.3	11.1	8.8
Combined shocks				
All firms	11.2	14.1	11.7	15.9
of which:				
Micro	10.9	13.2	13.4	18.2
Small	13.5	16.6	7.3	13.4
Medium-sized	12.2	15.0	9.3	15.5
Large	8.8	12.5	14.2	14.6

Sources: Orbis; and IMF staff calculation.

Note: The interest coverage ratio (ICR) is calculated using EBITDA. The firm sample is restricted to firms with non-missing debt. Enterprises with 1-9 employees are classified as micro, 10-49 employees as small, 50-249 employees as medium-sized, and over 250 employees as large.

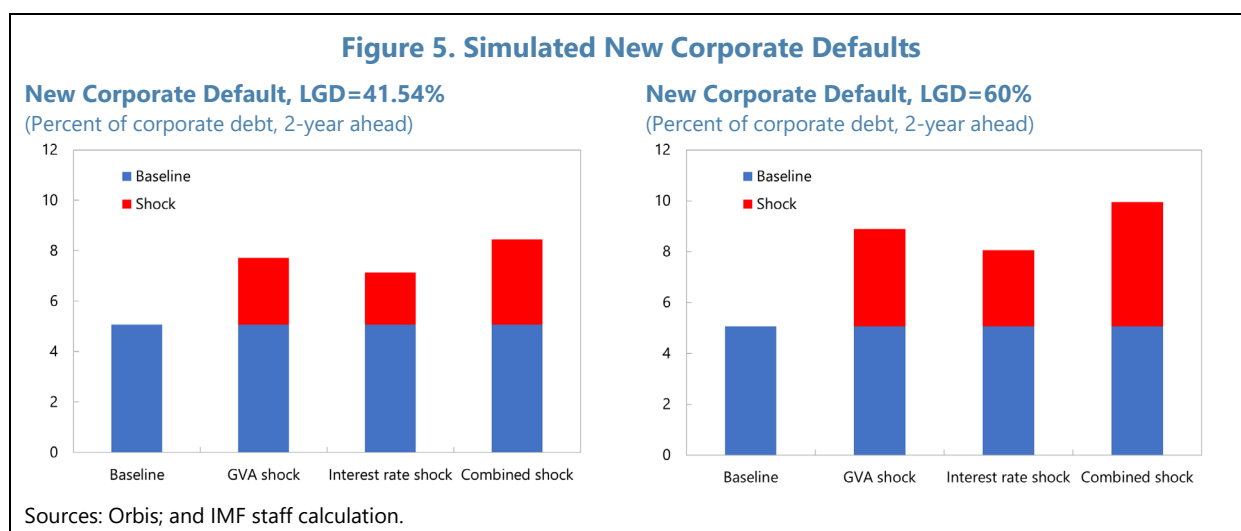
13. The deteriorating financial strengths of NFCs could lead to potential losses for banks due to their exposures to the NFC sector. It is beyond this paper's purpose to conduct a bottom-up assessment of corporate defaults using historical default instances. We instead rely on corporate default patterns estimated by the October 2013 GFSR as a first attempt.⁷ The GFSR calculations use historical default rates for five euro area countries and cover, in a few cases, countries that have been heavily affected by the GFC and the subsequent European debt crisis, which may not be a good representation of the corporate default pattern in Croatia. As a result, simulated results presented below should be interpreted with caution and serve only as illustrative examples to gauge how aggregate corporate defaults could respond to shocks, and in turn how banks' asset quality and capital could be affected.

⁷ See Appendix for detailed description of how corporate default rates are calculated in the simulation.

14. The simulated results suggest that shocks to NFCs could significantly raise banks' non-performing loans (Figure 5). Using the weighted average LGD of 41.54 percent, both the GVA shock and the interest rate shock would push the share of new corporate defaults in banks' corporate lending up by 2.6 and 2.1 percentage points, respectively, while the combined shock could lead to an increase of 3.4 percentage points. With a more conservative LGD, the standalone shocks are expected to further increase corporate defaults by about 1 percentage point, and a combined shock could almost double the share of corporate defaults, from 5.1 percent of banks' corporate portfolio to 10.1 percent.

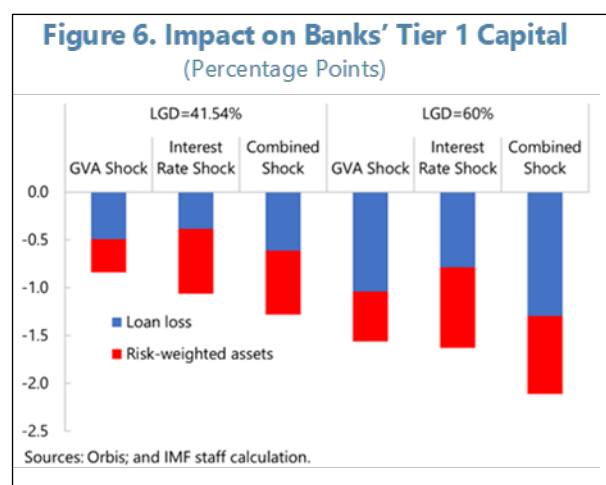
15. Alternative assumptions have moderate impacts on the simulated aggregate defaults.

We reassign sample weights to firms to align the labor share within each size group in the Orbis sample with that of SBS, thus giving the under-sampled micro and small firms higher weights in the aggregation (¶5 in the Appendix). This will increase the share of corporate defaults by 0.2 percentage points against the GVA shock but lower it by 0.1 percentage points against the interest rate shock, as SMEs tend to be less indebted and less vulnerable to changes to the cost of financing. Raising banks' exposure to SMEs from 36 percent to 75 percent would lower the share of defaults by about 0.3 percentage points almost uniformly across all shock scenarios. Lastly, when interest rates rise, firms could also receive higher interest income from the financial assets they hold. We assume that half of the interest rate increase (around 1.5 percent) passes to the corporate deposit rate. We proxy firms' financial asset by the cash and deposits reported in Orbis, or if not available, the difference between the reported current assets and inventories and trade receivables. The additional interest income from the interest rate shock would lower the share of corporate defaults by 0.2–0.3 percentage points.



16. The well-capitalized banking sector appears to have enough buffers to absorb losses from corporate defaults.

The deteriorated financial position of NFCs after adverse shocks influences banks' capital adequacy ratio (CAR) via two channels. First, loan losses from new corporate defaults could lower banks' capital, though they may be offset to some extent by existing provisions. Second, the performing part of the corporate portfolio becomes riskier, thus increasing risk-weighted assets, the denominator of the capital adequacy ratio. Both channels play a notable role in the simulation (Figure 6). The GVA shock induces a more severe impact through the loan-loss



channel while the interest rate shock is more influential via the risk-weight channel. With the weighted average LGD of 41.54 percent, the GVA shock would reduce CAR by 0.8 percentage points, the interest rate shock by 1.1 percentage points, and the combined shock by 1.3 percentage points. The reduction in CAR with a more conservative LGD is expected to be more pronounced, from 1½ percentage points for separate shocks to 2.1 percentage points for the combined shock. However, given that the banking system's tier-1 CAR stood at 23 percent at end-2023, there seems to be sufficient capital buffers overall to absorb losses in NFCs examined in the sensitivity analysis.⁸

D. Conclusions

17. The NFCs in Croatia have significantly improved their balance sheets over the past one and half decades. Relying on macro-financial scenarios calibrated by the EBA, firm-level simulations in this paper suggest that the corporate sector overall is able to weather adverse shocks to GVA and interest rates, which would result in manageable increases in corporate defaults. Distress of the corporate sector will spill over to banks through credit exposures, but the well-capitalized banking sector appears to have enough buffers to absorb losses. It is worth noting, however, that the simulations presented in the paper are based on a static exercise, which abstracts from stochastic shocks and uncertainty that characterize the real-world operating environment for firms and thus their dynamic decisions. The exercise also narrowly focuses on the corporate sector and makes a simplified assumption that adverse shocks stemming from a broad adverse macro-financial scenario leave the other parts of banks' portfolio unchanged. In reality, when pressures emerge from banks' corporate portfolios due to negative macroeconomic shocks, they may also emerge from household portfolios or other segments of bank balance sheets. Thus, the sensitivity analysis only presents a partial picture.

⁸ The sensitivity analysis is performed using the aggregate banking sector data. It cannot be ruled out that individual banks could see their capital fall below prudential requirements if they start with thin capital buffers and/or are highly exposed to the NFC sector.

18. Further work is needed to understand NFCs' relatively subdued recovery from the GFC in Croatia. The declining borrowing costs and improving financial strength of NFCs in Croatia point to the need to examine both financing and non-financing related obstacles. Compared with its peers, NFCs in Croatia recovered more gradually after the GFC, making limited contribution to employment, and having low investment rates (Figure 1). A related issue is why NFCs rely increasingly less on bank financing and whether hurdles come from supply or demand sides. Annex V of the Staff Report presents initial investigations from a productivity angle.

Appendix I. Data and Stylized Facts by Sector

Data

1. In addition to macroeconomic indicators on GDP growth and prices from the World Economic Outlook, the paper makes use of the following aggregate data sources:

- Structural Business Statistics (SBS) by Eurostat, which provides aggregate data on the number, value-added, employment, and investment of the non-financial corporations (NFCs) by industries (NACE Rev. 2) and firm size (defined by the number of employees).
- Sectoral accounts also compiled by Eurostat as part of the national account statistics, which provide information on financial flows and stocks across domestic sectors (including the NFCs) and the rest of the world. This underlies the financing structure of NFCs by major instruments and counterparts presented in the introduction section.
- The National Bank of Croatia, which provides the amount and quality of loans to NFCs by major industries.

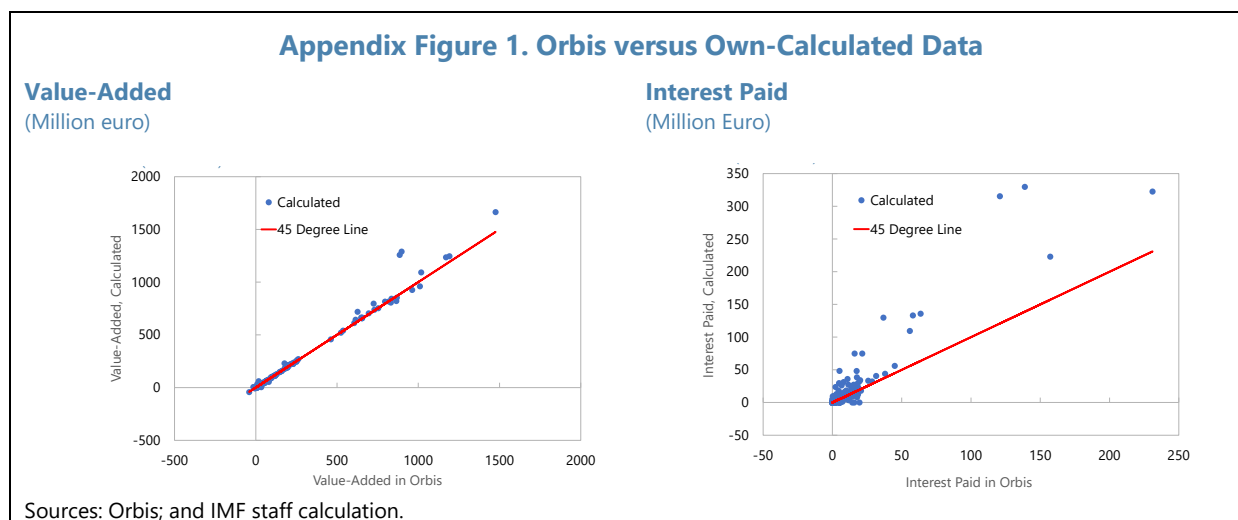
2. Firm-level data are from the Orbis Database of the Bureau van Dijk. We first perform basic data cleaning by excluding observations with negative number of employees or employee costs, sales, fixed assets, or a few other financial variables (such as shareholder funds, interest, long-term debt, etc.). Following Kalemlı-Ozcan and others (2015), we include firms regardless of their filing types (consolidated or unconsolidated financial accounts); for firms that have a mixed filing patterns over years, we choose the filing type that occurs more frequently. Lastly, we restrict our analysis to 2008–21 as the numbers of reporting firms in Orbis are relatively scanty prior to 2008, and very few firms have already reported their 2022 results so far.

3. Among firm-level variables of interest, the value-added (“Added_value”) and interest paid (“Interest_paid”) are missing for most firms. Hence, we calculate them as follows:

$$\text{Value-added} = \text{EBITDA} + \text{Costs_of_employees}$$

Interest paid = EBIT - P_L_before_tax if the difference is positive. For the very few firms where EBIT and P_L_before_tax are missing, we proxy the interest paid with the financial expense (“Financial_expenses”).

4. Appendix Figure 1 illustrates how thus calculated value-added and interest paid compare with the firm-reported ones when the latter are non-missing. The calculated value-added closely aligns with the firm-reported value-added, and we also show that it seems to be a good industry-size representation of the aggregate firm distribution revealed by the Structural Business Statistics (Table 1). However, the calculated interest paid tends to exceed the reported one, which could introduce a downward bias to the interest coverage ratio, an important indicator we use to gauge NFCs’ financial strength and vulnerability.



5. With the calculated variables, we end up with a sample of almost 380,000 firm-year observations for which information on the number of employees, value-added, interest payment, and debt is available (Appendix Table 1). The coverage of medium-sized (with 50 to 249 employees) and large (over 250 employees) firms has been stable over time, while the coverage of the still under-represented micro (less than 10 employees) and small (10 to 49 employees) firms is improving. It is worth noting that the table reflects the common sample for all analyses; the sample size could be different depending on the specific analysis.

Appendix Table 1. Croatia: Orbis Sample Number of Observations

	Micro	Small	Medium-sized	Large	Total
2008	15,679	7,107	1,708	431	24,925
2009	17,391	7,091	1,619	396	26,497
2010	17,861	6,526	1,547	366	26,300
2011	17,213	6,432	1,511	367	25,523
2012	17,084	6,346	1,521	355	25,306
2013	16,333	6,282	1,417	344	24,376
2014	16,185	6,350	1,415	328	24,278
2015	16,359	6,661	1,447	325	24,792
2016	17,292	7,087	1,466	336	26,181
2017	18,136	7,193	1,537	351	27,217
2018	19,301	7,510	1,535	364	28,710
2019	21,279	8,005	1,632	393	31,309
2020	21,905	7,980	1,630	373	31,888
2021	22,844	8,251	1,658	376	33,129

Sources: Orbis; and IMF staff calculation.
 Note: Enterprises with 1-9 employees are classified as micro, 10-49 employees as small, 50-249 employees as medium-sized, and over 250 employees as large.

6. As micro and small firms appear to be under-sampled, we assign new sampling weights to individual firms when we aggregate firm-level results into the overall impact. To do this, we partition firms by sector and by firm size measured by the number of employees. We then assign probability weights to each sector-size group so that (i) the weight is proportional to the ratio of group-specific total number of employees in SBS to that in Orbis; and (ii) the weighted sum of employees in Orbis

is equal to the total number of employees in the SBS after rescaling. The overall new corporate defaults and their impact on bank capital using the weighted Orbis sample are discussed in the sensitivity analysis section as a robust check.

Approximating Corporate Defaults

7. We follow the methodology proposed in the October 2013 GFSR and used by Klein (2016) to quantify these losses. We need probability of default (PD), loss given default (LGD), and banks' exposure to make the calculation, which are calibrated as follows.¹

- **Probability of default** is determined using the simulated ICR calculated using EBIT. The ICR for each firm is placed into buckets that roughly correspond to Moody's rating scale, and each bucket is mapped to the upper bound of the cumulative default rates based on GFSR calculations using historical data for 1970–2012 (Appendix Table 2).² To illustrate, a firm with ICR=2 would be mapped to the "Ba" rating and hence its PD is assigned to 4.1 percent over a one-year horizon and 9.6 percent over a two-year horizon. We focus mainly on the two-year default rates since the macro-financial shocks used in the sensitivity analysis are not for the immediate future.

Appendix Table 2. Croatia: Mapping to Probabilities of Default 1/

Interest Coverage Ratio (ICR)	Implied Rating	Cumulative Default Rates (percent) 2/	
		Year 1	Year 2
27.0	Aaa	0.0	0.0
14.7	Aa	0.0	0.1
9.3	A	0.1	0.2
5.2	Baa	0.2	0.5
3.4	Ba	1.1	3.1
1.6	B	4.1	9.6
0.5	Caa-C	16.4	27.9

Source: IMF, Global Financial Stability Report (GFSR), October 2013.

1/ The table has been adapted from Table 1.10 on page 60 of the October 2013 GFSR.

2/ Based on 1970–2012.

¹ The calibrated PD, LGD, and banks' exposure, coupled with the 2021 Orbis firm distribution, imply a before-shock expected default of 5.4 percent of the NFC debt if LGD=41.54 percent, or 7.9 percent if LGD=60 percent. Both are between the actual non-performing loan (NPL) ratio in 2021 (9.9 percent) and its current level. We normalize the level of the baseline corporate default to be the latest available actual NPL ratio (5.1 percent as of Dec-2023) in Figure 6 and add to it the difference between the simulated after-shock and before-shock corporate defaults as shares of the corporate portfolio, the latter based on Orbis data.

² The calculations are based on historical default rates for five euro-area countries, i.e., France, Germany, Italy, Portugal, and Spain. They serve as an approximation to default probabilities of Croatian corporates in our analysis, with the caveat that Croatian corporates could behave differently.

- **Loss given default** is assumed to be uniform across NFCs in the simulation. We consider two cases in the simulation. The first, 41.54 percent, is the weighted average of loss given default of corporate portfolio in the EBA sample as of 2023Q3. As the EBA sample covers only banks that are subsidiaries of large international banks, we also consider a more conservative LGD of 60 percent.
- **Banks' exposure to the NFC sector** is inferred from the aggregate flow of accounts data (Figure 2). As of 2023Q3, 36 percent of NFCs debt is held by banks, and we assume that this share applies to all NFCs. Given that SMEs are less likely to access alternative financing, we present as a robustness check a scenario that increases banks' holding of SMEs debt to 75 percent while the holding of large firms' debt remains unchanged.

Simulating Impact on Bank Capital Adequacy Ratio

8. The impact on banks' capital adequacy ratio is simulated using an excel template developed by Gross and Población (2017), Module F. The reduced-form approach considers separately risk exposures following the Standard Approach and the Internal Ratings Based (IRB) Approach, the share of the latter is calibrated as 17 percent according to data from the Croatian National Bank as of December 2023. To capture the fact that performing firms also incur greater difficulties in servicing their debt after hit by adverse shocks, we adjust the average risk weight for exposures following the Standard Approach by mapping firms into implied credit ratings according to Appendix Table 2 and applying the corresponding Basel risk weights;³ the post-shock IRB portfolio is adjusted using Basel risk weights formula.

Croatia's NFC Performance by Sector

9. Given their importance and growth potential in Croatia's private economy, we focus our discussions on six sectors, manufacturing (C), construction (F), wholesale and retail trade (G), transport (H), accommodation and food and beverage services (I), and information and communications technology (K). All sectors are reasonably well represented by the Orbis data in terms of value-added and number of employees, except for moderate under-sampling of employment in accommodation and food (Table 1).

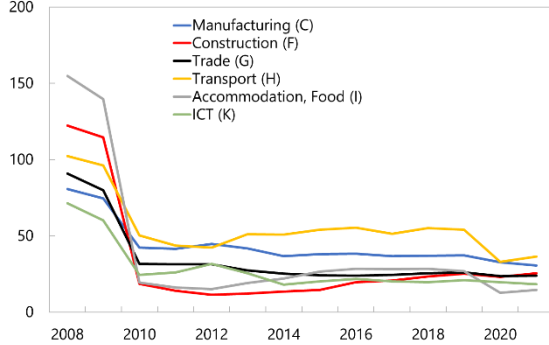
10. In line with the aggregate trends, all sectors deleveraged since the GFC. Nominal debt reduction was most dramatic in construction and accommodation/food, where the median firms shed half of debt as of 2021 relative to 2008. Even for transport which had the most modest debt reduction, the debt in the median firm in 2021 was 30 percent below its 2008 level. All sectors enjoyed declining borrowing costs over the past decade and in general improved their debt servicing capacity and creditworthiness. Construction, especially, underwent a downturn after the GFC but exhibited steady recovery since the mid-2010s. As expected, telecommunication outperformed other sectors on average in both profitability and strength, while the labor-intensive accommodation and food sector had thin buffers and was more susceptible to shocks.

³ See CRE - Calculation of Risk Weighted Assets for credit risk, BIS standardized approach: [CRE20.43](#).

Appendix Figure 2. Historical Performance by Sector, Group Median, 2008–21

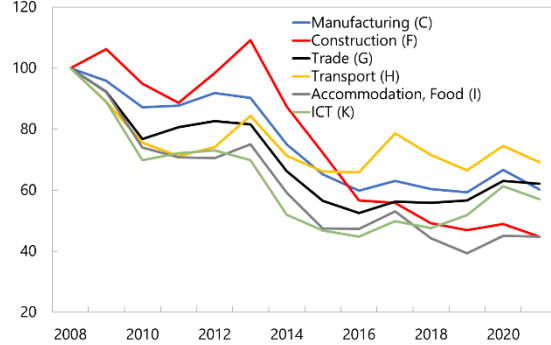
Debt to Equity

(Percent)



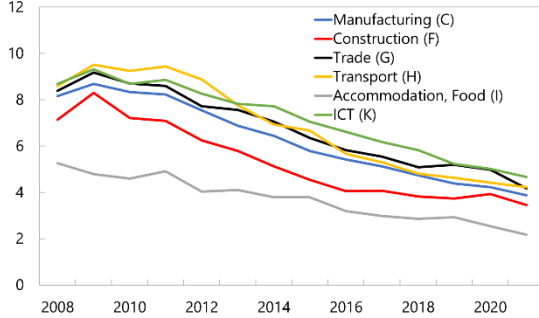
Nominal Debt

(2008 = 100)



Effective Interest Rates by Sector

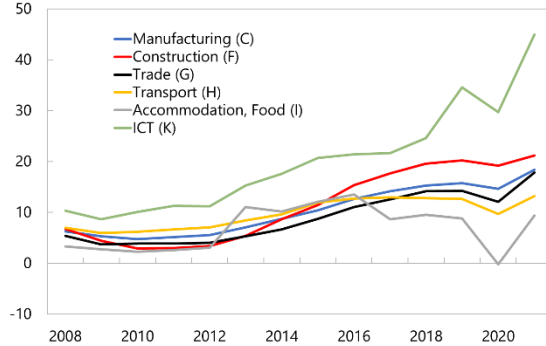
(Percent)



Note: ICT stands for information and communications technology.

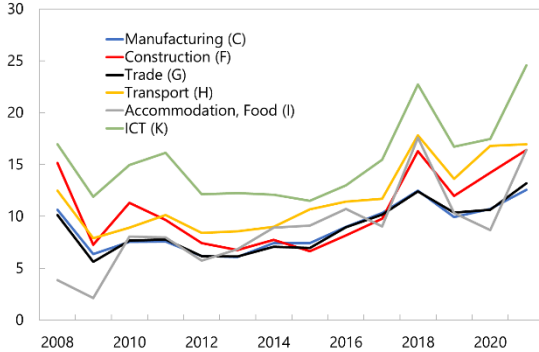
Interest Coverage Ratio

(Calculated using EBITDA)



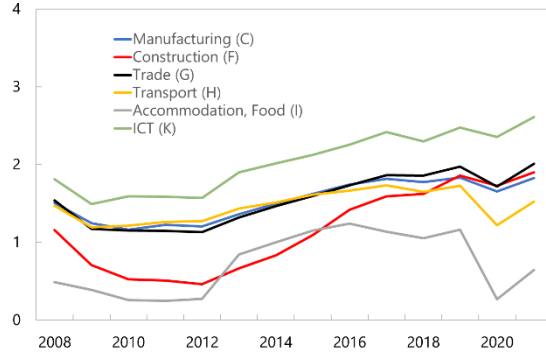
Return to Equity

(Percent)



Altman Z-Score

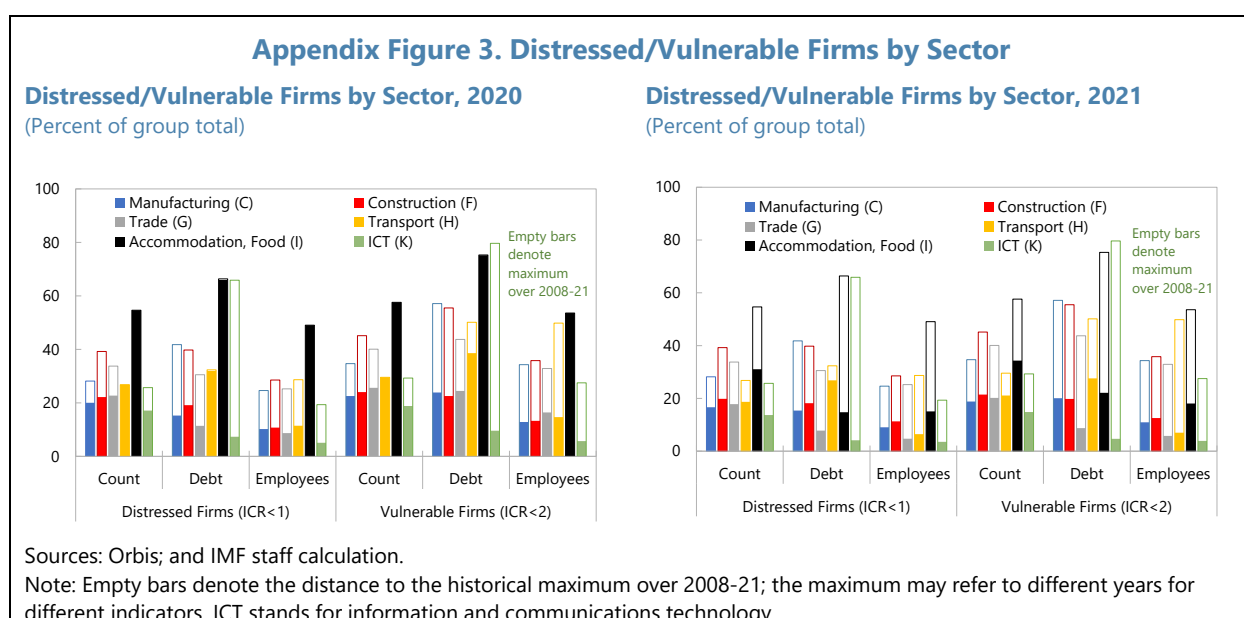
(Higher value suggests lower risk of default)



Sources: Orbis; and IMF staff calculation.

Note: The Altman Z-Score is calculated using the updated coefficients estimated with the ratio of the book value of equity to the book value of total liabilities. See Altman and others (2014). The median Z-Score calculated with the original coefficients is in general larger (indicating lower default probability) but displays similar trends across sectors and over time. ICT stands for information and communications technology.

11. There were also significant reductions of distressed or vulnerable firms. Trade and telecommunication compared favorably to other sectors in terms of both debt at risk and employment at risk in 2021, though telecommunication used to have very high debt concentrated in low-ICR firms, likely reflecting initial setup costs and decreasing-return-to-scale nature of the sector. Construction, and accommodation and food also achieved fast reduction of debt or employment at risk, but both stood elevated at around 20 percent in 2021. The accommodation and food sector, especially, came under severe stress in 2020 when the pandemic hit but recovered swiftly in 2021. Transport had a high share of debt (close to 30 percent) concentrated in distressed firms in 2021; however, this was mainly due to disruptions of the pandemic and the fact that the sector had a few marginal firms whose ICRs could easily fall below 1. In fact, the average debt in distressed transport firms during 2015-19 was 10 percent, while the average debt in vulnerable firms was more than doubled at 24 percent.



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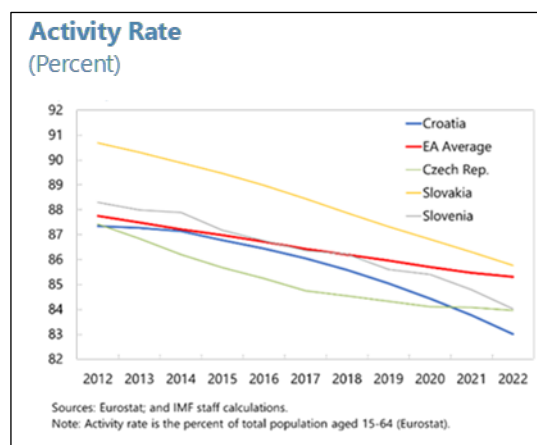
ADDRESSING LABOR SHORTAGE IN CROATIA¹

Labor market shortage is a source of concern for Croatia's medium-term growth prospects. Population aging and net emigration have been reducing the size of Croatia's labor force, while deficiencies in the education and adult learning system hinder upskilling and reskilling. A granular analysis of employment patterns provides evidence of untapped resources in some sectors and areas of the country and calls for policies to improve labor mobility and strengthen adult learning and education programs.

A. Introduction

1. Labor shortage represents a key challenge to Croatia's medium-term growth prospects.

Croatia has made substantive progress in the past decade. The successful accession to the European Union (EU) and the adoption of the euro represents landmark achievements underpinned by substantial economic and social progress. Income per capita grew more than 40 percent between 2012 and 2022 and labor force participation has steadily increased to almost 70 percent in 2022. Going forward, however, there are signs of labor shortage that could hamper Croatia's medium-term growth prospects.



Unemployment has reached historical lows of 7 percent in 2023. The share of firms reporting difficulties in filling open positions is 50 percent higher in Croatia than the average of Central and Eastern European (CEE) countries.² This shortage is driven by lack of both workers and required skills. The number of job vacancies over unemployment has steadily increased in the past decade and this increase has accelerated since 2022. Besides conjunctural factors driving the acceleration of labor demand since the COVID-19 pandemic, population aging and sustained outmigration have contributed to a shrinking working age population—the activity rate has dropped faster than in other CEE countries. At the same time, rapid technological progress (e.g., automation, Artificial Intelligence (AI)) can accentuate skills mismatch, given the predominantly low skilled labor force in Croatia. For instance, the share of working age population with tertiary education has stagnated at about 22 percent since 2018 while the average among CEE countries has grown to about 30 percent.

¹ Prepared by David Bartolini. The paper has benefited from insightful comments and discussions provided by the Croatian authorities.

² See [European Commission Business and Consumer Survey \(2023\)](#). Data refer to the percentage of respondent firms that indicate that labor is a factor limiting production/business minus the percent of respondents reporting that it is not. CEE countries considered in the calculation of the average include Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

2. This paper focuses on policies addressing structural factors behind the labor shortage.

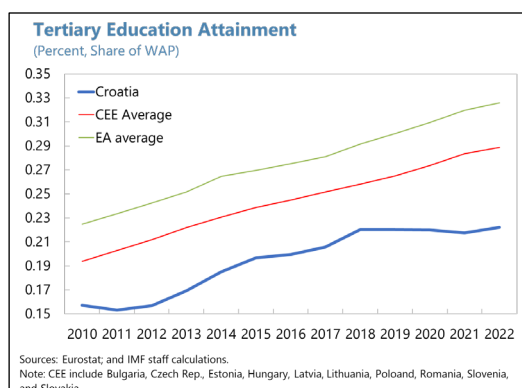
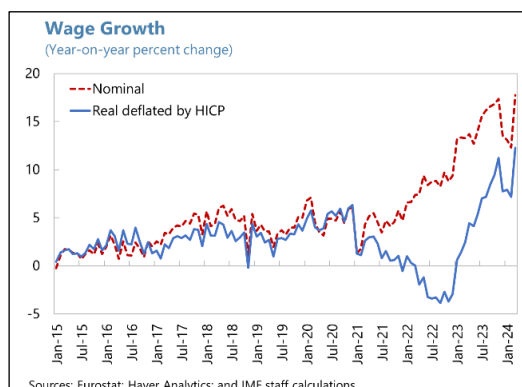
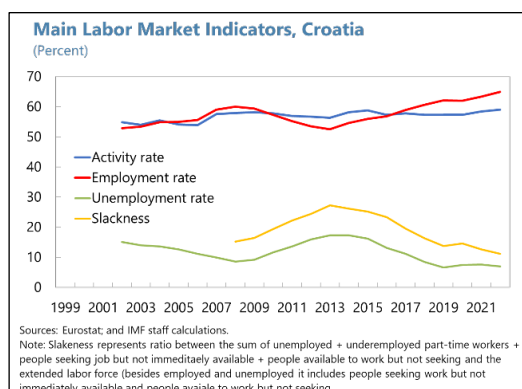
Promoting an efficient labor market would be most effective if embedded in a wider (overall) economic development strategy that includes fostering adult learning program, improving education quality, fostering mobility of workers across the country, and making use of immigrant workers.³ These supply side policies should be complemented with those aiming at fostering entrepreneurship and high-quality jobs (see Annex V of the 2024 Staff Report) to boost potential growth.

B. Croatia’s Labor Market

3. Both cyclical and structural factors contribute to labor shortage in Croatia. While the economy’s strong cyclical position contributes to increasing demand, structural trends, notably population aging, skill mismatches, and emigration, continue to weigh on labor supply. People’s decision to participate in the labor market (the extensive margin) and how many hours to work (the intensive margin) depend on the compensation and the value of leisure. However, the total number of workers is affected by structural trends like aging and migration patterns.

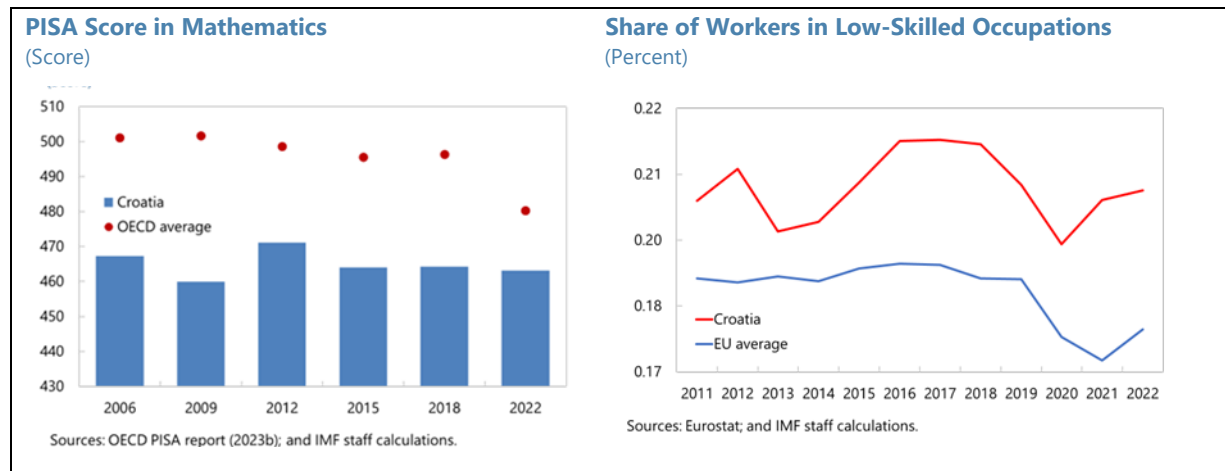
4. The labor market remains tight at the extensive margin. The employment rate rose further to 66.5 percent at the end of 2023, still lower than that of its peers. The declining unemployment rate (6 percent in the fourth quarter of 2023) together with increasing wages point to a tight labor market.

5. Skill mismatch also contributes to labor shortage. Absent any friction in labor supply, any shortage can be met by increasing wages. In practice, low mobility and skill mismatch may result in companies unable to fulfill their demand for labor even if they are willing to increase wages. This seems to be the case in Croatia where the share of population with tertiary education is substantially lower than the euro area average and the gap has widened since 2018. In addition, data shows that the share of workers in low-

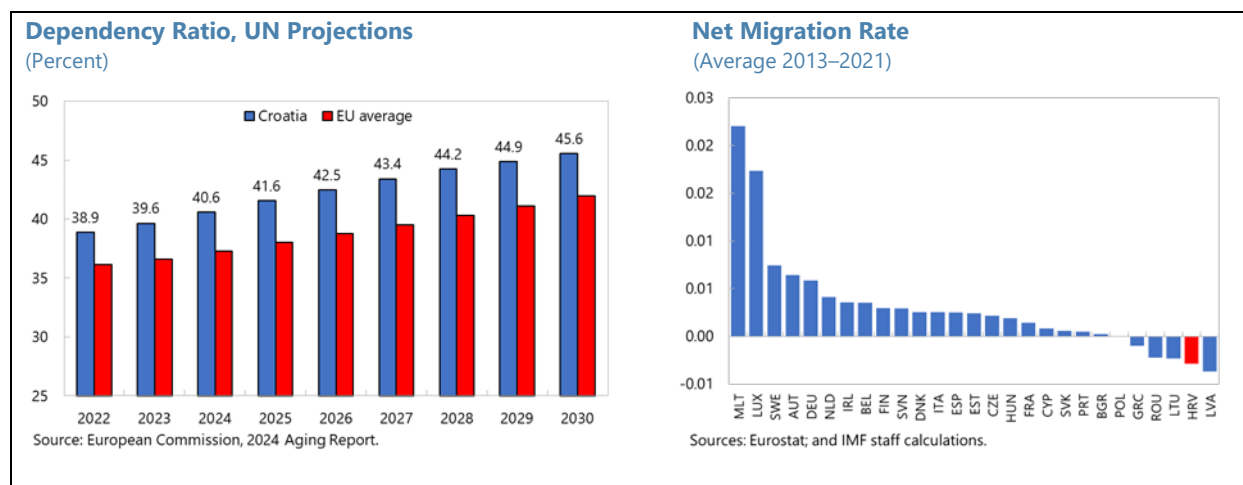


³ Recent World Bank (2019) and OECD (2023a) reports have also highlighted the need to strengthen the skills of the labor force and boost labor force participation.

skilled occupations⁴ is above the euro area average and has increased since the pandemic. Prospects for future workers do not look promising either, given that the latest OECD PISA assessment places Croatian students below average OECD achievements in Mathematics and Science—with a smaller gap due to declining OECD average rather than improvements in Croatian students’ score (OECD, 2023b).

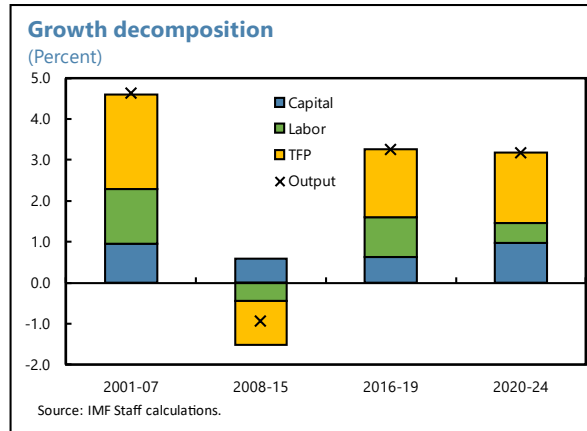


6. Aging and emigration exacerbate shortage. Population aging and declining birth rates represents medium-term risks for the economy. According to the European Commission (2023) report, the old-age dependency ratio is already higher than the EU average and it will reach 45 percent by 2030. In addition, widespread population aging across European advanced economies compound pull factors for Croatian workers. Indeed, Croatia has been affected by a wave of outflow migration in the past decade that has depleted the economy of workers and valuable skills. While the increasing income per capita could attenuate the incentive to migrate, the adoption of the euro and the participation in the Schengen area reduces migration costs. In 2021, the latest year of cross-country available data, the net migration rate is still negative.



⁴ Low-skilled occupations include services workers, shop and market sales workers, and other elementary occupations.

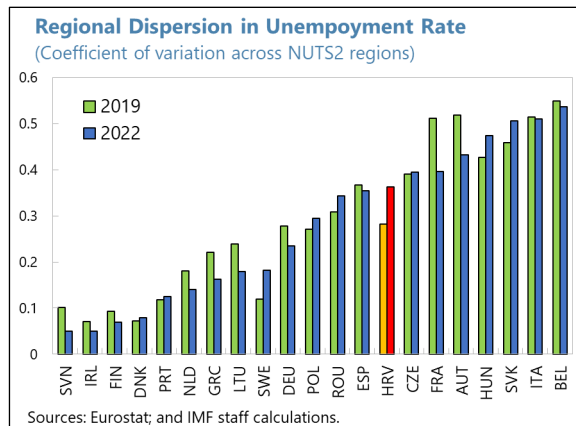
7. Labor contribution to GDP growth has declined. Growth accounting provides a framework to decompose GDP growth into three main components: physical capital, labor, and total factor productivity (TFP). Using a Cobb-Douglas production function ($Y_t = A_t K_t^\alpha L_t^{1-\alpha}$), we show that the contribution of labor to growth has declined after the COVID-19 pandemic, compensated by a larger contribution of physical capital. Restoring the contribution of labor to pre-pandemic levels could boost GDP growth.



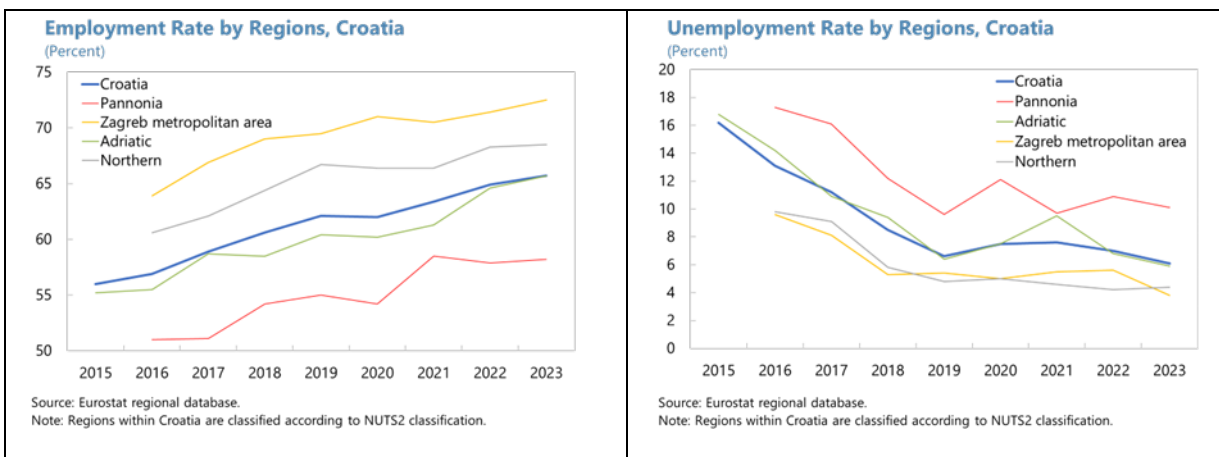
C. Beyond Aggregate Numbers

8. Going beyond aggregates would provide a better understanding of bottlenecks and opportunities. Looking at labor force participation by gender, age groups, economic sectors, occupations, and geographical location can shed light on whether there are untapped sources of labor that could be activated with targeted policies. Similarly, adult learning policies might need to be better targeted to the specific needs of workers in order to foster their participation.⁵

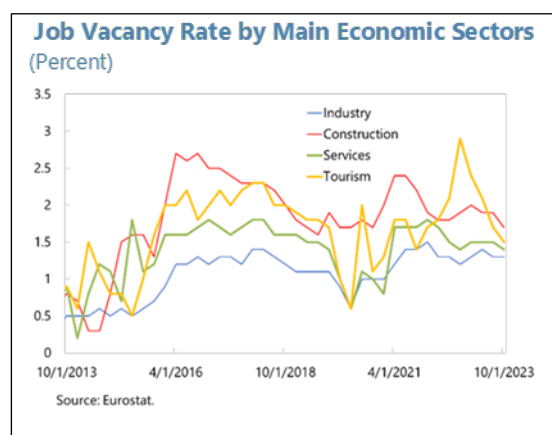
9. Large territorial differences exist across the country. The tightness of the labor market differs across the country. The unemployment rate in the region of Pannonia (more than 10 percent) is well above the national average. By contrast, the metropolitan area of Zagreb and the Northern region experience the lowest unemployment rate and have employment rates higher than the national average. In addition, territorial differences in the unemployment rate across Croatia have increased since the pandemic.



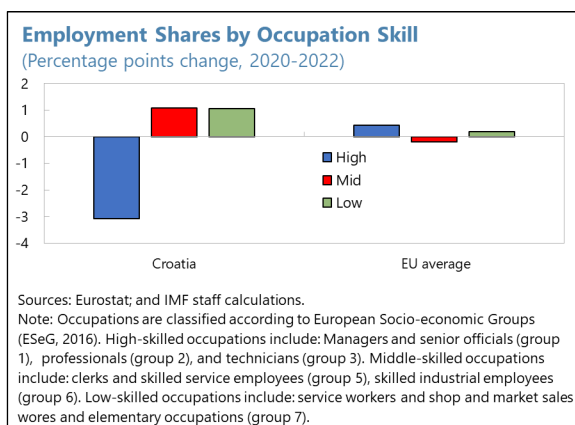
⁵ Although we acknowledge that part of the problem could stem from the demand for jobs (i.e., public policies should aim at fostering entrepreneurship and high-quality jobs according to Annex V of the 2024 Staff Report), this paper focuses on the supply side of the labor market.



10. Sectoral differences also help to explain recent development. Labor shortage seems to be mainly driven by the construction and tourism sectors. The job vacancy rate, a common measurement of labor shortage, is higher in the construction and tourism sector since 2016.⁶ By contrast, the job vacancy in industry and services is roughly stable—beside the drop during the pandemic. There is a cyclical component as tourism benefitted from pent up demand after the pandemic, but together with construction the tourism sector has been experienced higher job vacancy rates even before the pandemic. In this context, facilitating mobility across sectors could ease labor shortage. However, the scope for this sectoral mobility is usually limited by the level of skills and education of the workforce.



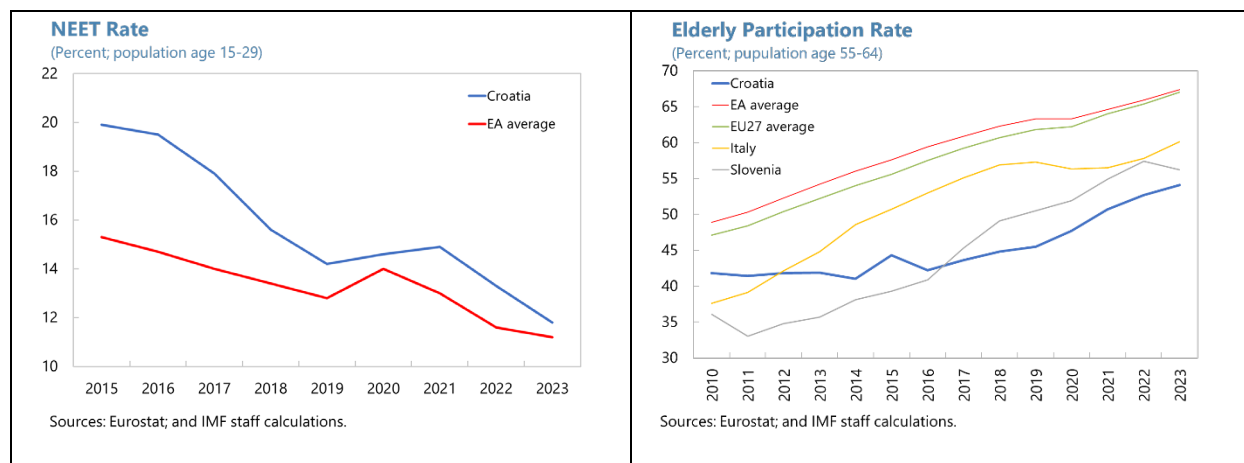
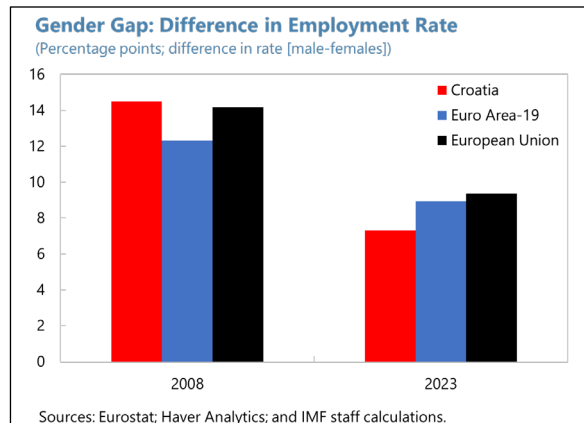
11. Contrary to most EU countries the share of employment in high-skilled occupations had declined after the pandemic. The labor market in most advanced economies has experience a polarization with an increase of demand for cognitive and manual (low-skilled, non-routine) occupations, while jobs in routine occupations have declined (Goose et al. 2009). The latter refers to blue- and white-collar jobs hit by the off-shoring of manufacturing production and the introduction of robots and automation, which



⁶ The job vacancy rate is defined as the job vacancies to unemployment ratio.

focus more on routine tasks. In Croatia, the increase of employment in middle-skilled occupations may result from the tourism rebound after the pandemic. However, the sharp decline in high-skilled occupations may signal a shortage of skilled workers to fill such occupations, which is necessary for Croatia to move to higher value-added productions that can boost productivity.

12. Although the elderly participation rate has increased, it remains well below the EU average. This low participation of seniors (55–64 year of age) represents untapped potential labor force. Similarly, the rate of youth not in employment or education (NEET) is declining but still above the EU average. Therefore, fostering the participation of these groups in the labor force can help ease labor shortage. Female workers are usually underutilized in most countries. In Croatia, however, the gender difference in employment rate has closed and in 2023 it is below the EU average.

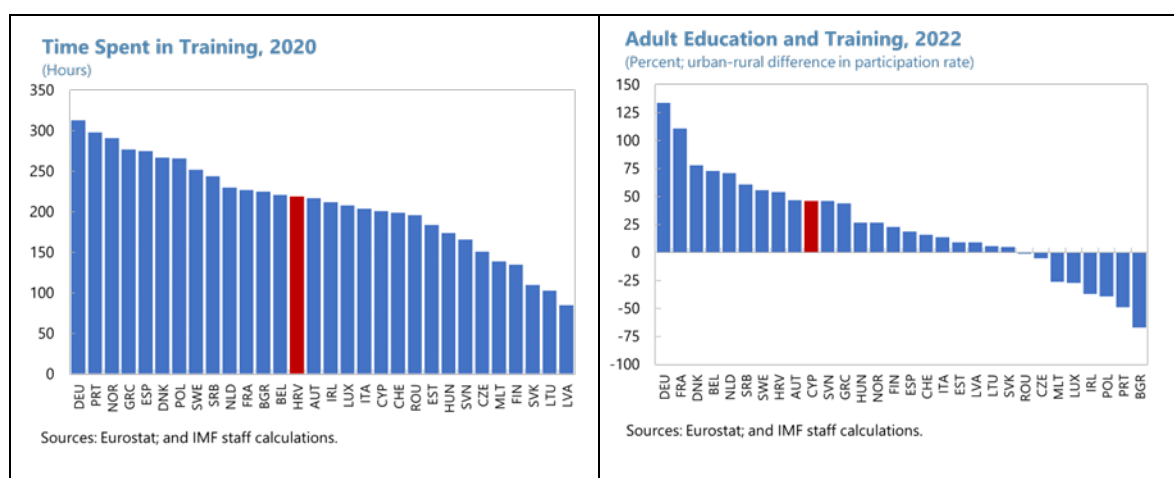


D. Policy Responses

13. The multidimensional nature of labor shortage requires coordinated policies to foster higher labor participation and upskilling and reskilling. Based on the analysis conducted in the previous sections we can identify priority areas of intervention to ease labor market shortage. Under the EU Recovery and Resilient plan (NRRP), Croatia has already implemented a few labor market reforms with the goal of improving adult learning and better targeting active labor market policies. In addition, amendments to the 2022 Labor Law provide the legal framework to modernize the labor

market.⁷ Still, skills mismatch, net emigration, low domestic labor mobility, and pockets of inactivity among young and older adults represent major sources of labor shortages. Technological progress (e.g., digitalization, AI) is rapidly changing the nature of work, with a decline of employment opportunities in middle-skilled occupations and an increase in both high-skill and low-skill occupations (so called “job polarization”). The education and adult learning system need to prepare students and workers to adapt to new skill requirements and working conditions. In this context, the NRRP’s focus on promoting digitalization represents a step in the right direction.

- **Strengthening vocational education and training to ease school-work transition.** Although inactivity among young people has been declining, it is still above the EU average and the European Commission’s threshold of 9 percent by 2030.⁸ Strengthening vocational education and training with a closer interaction with the world of work can help students transition from school or inactivity to the labor market. Similarly, improving the quality of the education system would help develop the skillset required by the labor market. Together with providing teachers with training and professional development courses, the authorities’ plan to extend students’ time in school goes in the right direction, as studies show that spending more time in school’s facilities positively affects learning (Wedel, 2021). In addition, Croatia should foster enrollment in tertiary education, which remains below the EU average.



- **Improving the quality of adult learning.** The share of workers in low-skill occupations is higher than the EU average and the gap has widened. At the same time, the time spent in training is below the EU average. Expanding the range of programs offered and allowing customization of curricula to better suit individual needs may boost participation in adult training (OECD, 2023a). Developing distance learning could boost participation in adult learning programs, especially in rural areas where participation is low compared to urban areas, provided

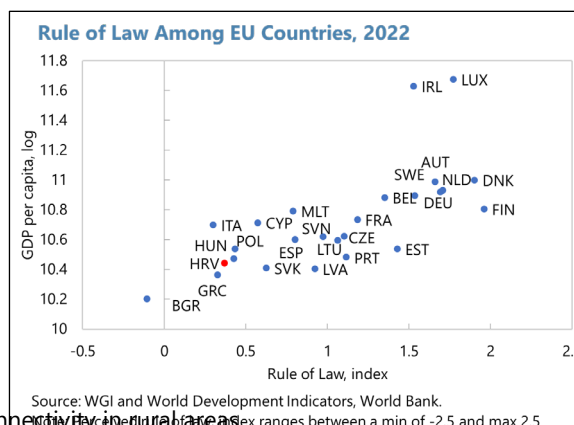
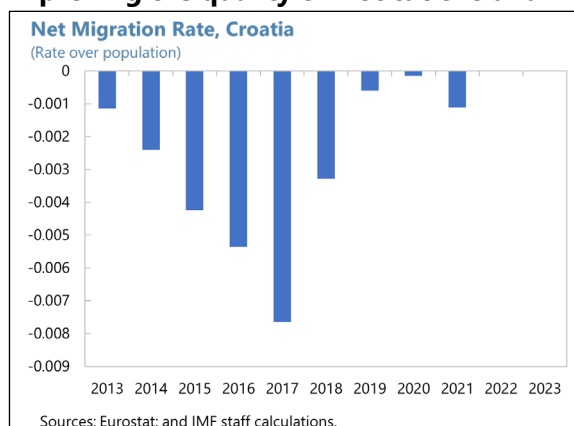
⁷ The amendments took effect in January 2023 and included the transposition of two EU directives (on life-work balance and fair working conditions) and the recognition of the status of permanent seasonal workers to address growing labor demand and the extension of the tourism season.

⁸ The European pillar of [social rights action plan](#) sets targets in several social domain, including equal opportunities and access to the labor market.

that digitalization efforts are accelerated.⁹ In addition, raising elderly participation rate and extending working life can help ease labor shortage and address pension sustainability.

- Improving labor mobility across the country.** Labor market slackness is higher in some regions within Croatia. The region of Pannonia, for instance, registers a higher unemployment rate than the national average. Those workers that are looking for jobs and cannot find it in Pannonia could move to another region where there is a higher demand for jobs. The decision however depends on the trade-off between the costs of moving and the benefits in terms of wage and wellbeing. Promoting a more efficient rental and housing market¹⁰ would reduce the cost of moving, thus facilitating workers' mobility. The benefits are linked to job opportunities in high value-added occupations and local workers' skillset. In this context, adult learning programs should focus on upskilling and reskilling the local labor force and prepare them to take up jobs also in other parts of Croatia. In addition, introducing the possibility for seasonal workers to have permanent contracts could incentivize people to move to touristic areas where demand for jobs is high.

- Reversing the emigration trend would require improving the quality of institutions and social benefits.** Although net migration rates are less negative since the pandemic, reversing the long wave of emigration would be challenging. Atoyan et al. (2016) identifies three main determinants of migration: differences in per capita income levels; quality of institutions; and employment prospects, including social benefits. The quality of institutions, such as the rule of law and control of corruptions, mainly matters for skilled migrants, while social benefits matter more for unskilled migrants. Croatia has reduced the income per capita difference with more advanced European countries, but it is still behind in terms of quality of institution (e.g., rule of law) and social benefits—government spending on social protection in 2022 was about 13 percent of GDP compared to the EU average of about 20 percent.¹¹ Immigration of foreign workers has increased after the pandemic,



⁹ The NRRP include €130 million for enhancing broadband connectivity in rural areas.

¹⁰ OECD (2023b) highlights the challenge of a thin rental market and rising house prices as a main impediment for adult workers to relocate to areas with greater job opportunities.

¹¹ See [Eurostat data](#) based on COFOG 1999 classification of government spending. Social protection includes (but are not limited to) unemployment benefits, workers' sickness and disability benefits, family and children benefits, as well as housing benefits.

fueled by increasing demand for jobs in the tourism and construction sectors. Amendments to immigration law have facilitated the request and granting of working permits. Together with retaining workers and reducing emigration, policies to attract and integrate foreign workers into the Croatian labor market are important to deal with the structural labor shortages.

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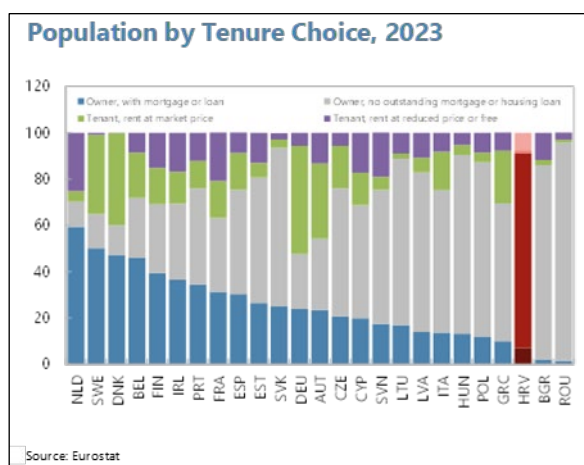
ADDRESSING HOUSING AFFORDABILITY IN CROATIA¹

Driven by strong demand, including from foreign investors, and scarce housing supply, house prices in Croatia have risen considerably, stretching house affordability. Unlike in the 2000s, financial stability risks are contained, partly reflecting a low share of mortgage finance. Improving housing affordability can support labor mobility, promote sustainable economic development, and counter negative emigration trends. Policies need to tackle the underlying supply gap in housing rather than helping demand. There is scope to modernize and make better use of the sizable existing housing stock. Reducing or removing the favorable tax treatment of residential real estate investment and short-term rental income would help reduce speculative demand and activate idle housing. Policy action is also warranted to accelerate the modernization of the legal cadaster, develop the longer-term rental market, streamline land regulations, and invest in green social housing and infrastructure.

A. Introduction

1. Housing affordability has considerable economic and social implications. Housing affordability—households' ability to use their disposable income to cover housing costs while continuing to meet other essential needs and still have an income buffer is macro-critical.² The relative evolution of household income and house/rental costs or prices has widespread implications for the economy.

- In assessing housing affordability, one needs to consider the specificities of Croatian housing market: (i) high homeownership rate (87 percent); (ii) thin and largely unregulated longer term rental market; (iii) persistently low residential mobility, with only 5 percent of the population having relocated in the previous five years ; (iv) concentration of demand for tourism services especially along the coast; (v) uneven density for urban agglomerations; (vi) infrastructure gap; and (vii) among the lowest income per capita in the eurozone. If earnings for higher income households—including from foreign investors buying property in Croatia—

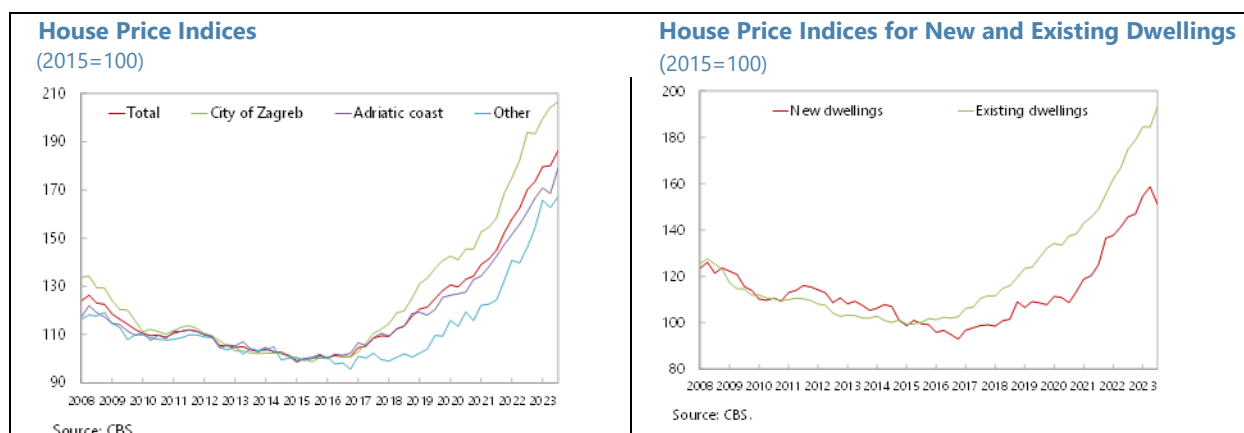


¹ Prepared by Irina Bunda, with assistance from Jibingxin Han. The analysis has benefited from comments and suggestions from Josip Funda, and staff of the Ministry of Finance, Croatian National Bank (CNB), Ministry of Physical Planning, Construction, and State Assets, Croatian Tax Administration Office, and participants of the seminar held at the CNB on June 6, 2024.

² As a rule of thumb, housing is considered affordable if households spend up to 30 percent of their gross income on housing costs including insurance and taxes.

increase faster than for lower-income households, housing affordability worsens for the latter group, as demand-driven house/rental costs affect average house prices and rents.

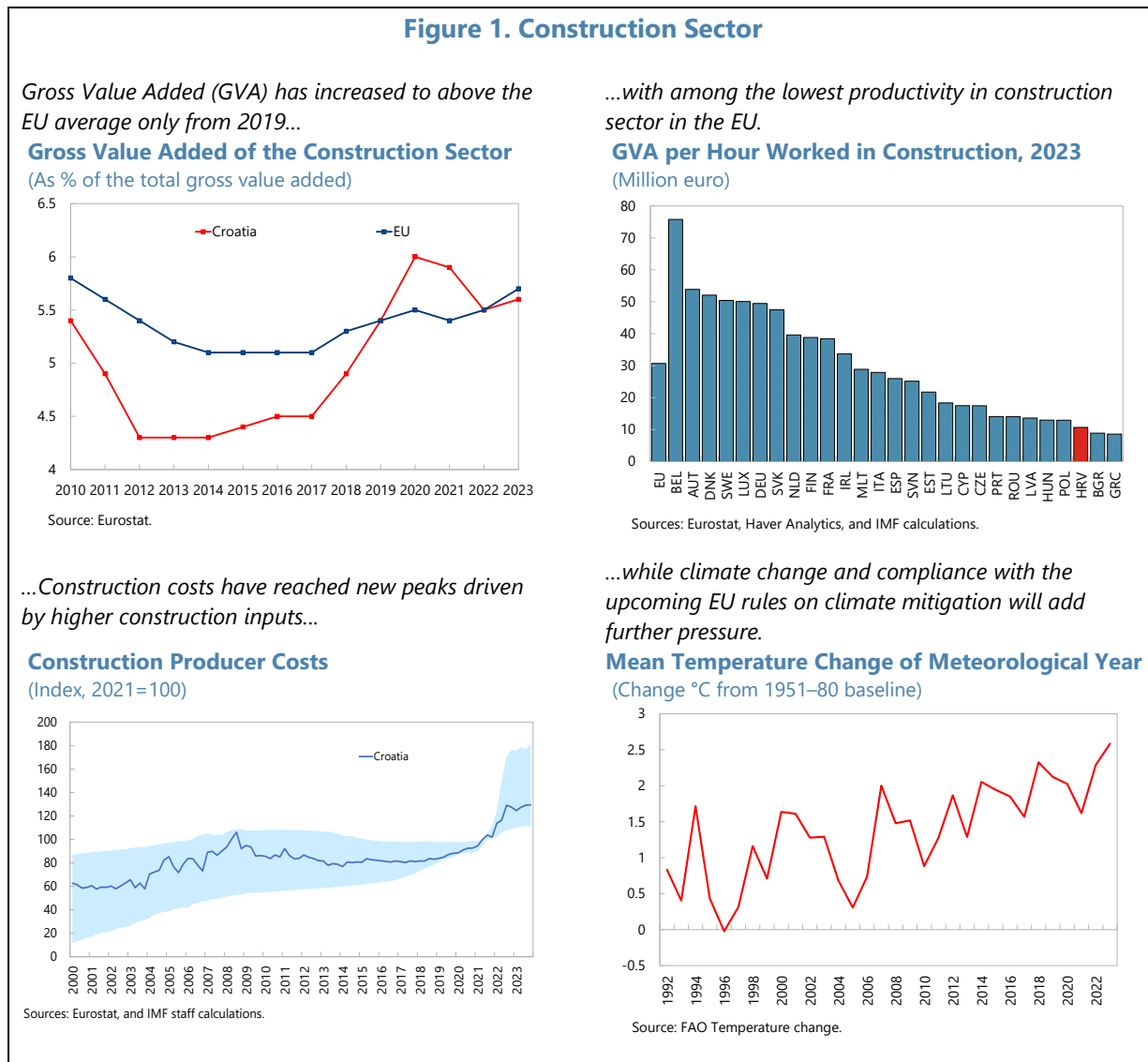
- It is well established in the literature that housing prices affect residential and labor mobility (Stein, 1995, Genesove and Mayer, 1997). House prices have evolved very differently across Croatian regions in recent years, accelerating in tourist destinations and their gentrified centers (such as Dubrovnik, Split, and Šibenik). As tourism accommodation is heavily skewed toward small private rentals that crowd out rental supply for longer-term use,³ an intensification of tourism activity significantly impacts housing affordability. Rising differences in relative house prices between the coast and inland constrain the ability of lower-income individuals to move to areas where there are jobs available. Lower housing prices in inland areas lock in existing homeowners as their equity becomes too low to meet down payment requirements to purchase a new home. Thus, improving access to housing can support labor mobility, sustainable economic development, and social cohesion.



2. Underinvestment in the aftermath of the Global Financial Crisis (GFC) has contributed to the current housing shortage. The GFC house price bubble was at the root of the financial distress in Croatia. The bursting of the bubble led to the bankruptcy of many real estate developers and construction companies. Employment in construction fell by 36 percent between April 2015 and April 2009. A period of falling house prices and scarce supply ensued, with housing market activity picking up only in the mid-2010s. Since 2015, a growing housing demand-supply gap and years of low interest rates that fueled the demand for housing investments led to a significant rise in house prices, which more than doubled in the capital city of Zagreb between 2015-2023. While demand has been buoyant, supply has not yet reached its pre-GFC levels, given the limited pace of new residential constructions. As of 2022, investment in dwellings accounted for 15 percent of gross fixed capital accumulation in Croatia, much lower than the EU average of 26 percent. Productivity of the construction sector has remained at about one third of the EU average; despite picking up in the mid-2010s, it has surpassed the pre-GFC level only in 2018, slightly improving thereafter. Croatia's

³ See Box 1 in CNB's [Financial Stability Report](#), June 2024.

construction sector has been characterized by productivity inefficiencies due to its significant fragmentation and a shortage of skilled construction labor, further hampering housing affordability.

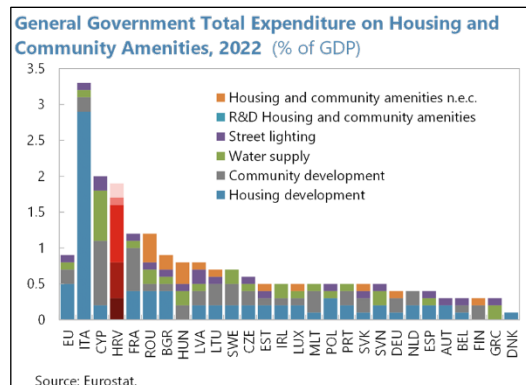


3. Croatia’s housing affordability has worsened in recent years. After falling in the first half of the 2010s, prices and rents have grown rapidly in real terms since 2015. Despite the pandemic, house prices resumed their pre-pandemic trends in 2021. Some of the housing stock was damaged and destroyed by the two large earthquakes that hit Zagreb and Petrinja in 2020. The recovery and reconstruction needs were estimated at €26 billion (about 39 percent of 2022 GDP), with the largest share related to housing, much in central Zagreb. Construction activity picked up at a faster pace than the EU average after the reopening of the economy in 2021, boosted by the post-earthquake reconstruction works that accelerated in 2022-2023, burgeoning tourism, foreign demand, improved economic prospects, and Croatia’s entry into the eurozone and Schengen area. Demand for real estate has gone up not only in the touristic regions, but also in most major cities such as

Zagreb, Rijeka, and Split. Regional differences of price levels are striking. However, the number of residential building permits stagnated in 2022-23 and remains 1/5 below the pre-GFC peak. The tight labor market led to rising construction costs, further adding to the pressure on house prices.

4. Since the 2000s, the Croatian authorities have introduced measures to improve housing affordability, but some of the measures have also fueled demand.

Government spending on housing is relatively high in Croatia compared with other EU countries. The upcoming National Housing Policy Plan until 2030 is expected to define the modalities of housing construction and solving housing issues to facilitate access to the purchase of apartments or the payment of rent through various subsidy measures. The government is considering building flats for rent. Public-private partnerships



between towns and municipalities (i.e., local government units (LGUs)) and private banks for affordable rental housing are also considered. Some municipalities that saw fast housing affordability deterioration (e.g., the city of Varaždin) are planning to sell suburban land to young families that do not wish to live in a flat at up to 80 percent discount, based on several socio-economic criteria.

5. The rest of the paper is organized as follows. Section B assesses how housing affordability in Croatia has evolved over time and in comparison to other European countries. Section C discusses the main drivers, including policies, affecting house prices and affordability. Section D discusses policy options and provides examples of measures to address housing affordability.

B. Housing Affordability Assessment

6. While Croatia's prevalent homeownership structure and policy support have limited increases in actual housing outlays, housing is less affordable than in many of its EU peers.

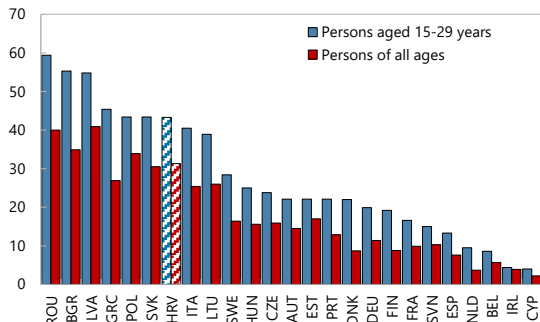
85 percent of the population are homeowners without outstanding mortgages or housing loans, compared to 44 percent in the EU. Only 6 percent live in their own homes with mortgages. Nearly 2/3 of Croatia's population (compared to just over a half in the EU) live in detached houses, while most urban dwellers live in apartments. Variable-rate loans (fixed up to one year) of households account for about 1/3 of housing loans and legal restrictions have slowed the increase of mortgage rates, limiting actual outlays related to housing costs. However, access to homeownership for low- and middle-income households has worsened due to greater difficulties in saving for housing purchases. The young and those with low incomes and unstable employment are effectively excluded from ownership and exert pressure on the very thin longer-term rental market. There are signs of overcrowding of existing housing units while the longer-term rental supply is very low and many units remain vacant, pointing to inefficiencies in the housing market.

Figure 2. Housing Affordability: Housing Cost Indicators

There is evidence of housing overcrowding in Croatia, especially for the young.

Overcrowding Rate, 2023

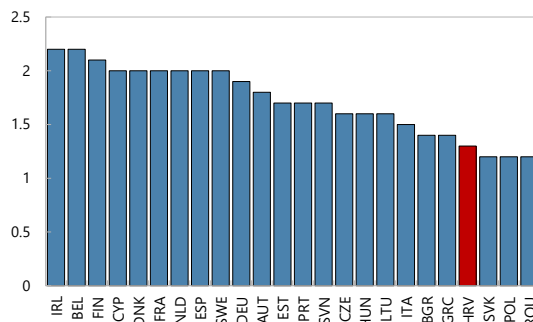
(Percent)



Source: Eurostat.

Housing space is more limited than in the rest of the EU...

Average Number of Rooms per Person, 2023

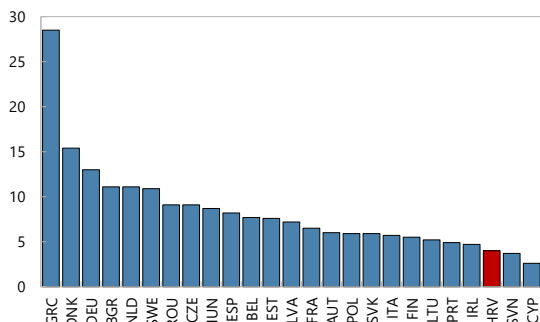


Source: Eurostat.

...which, together with support measures, significantly reduces the average housing costs.

Housing Cost Overburden Rate, 2023

(Percent)

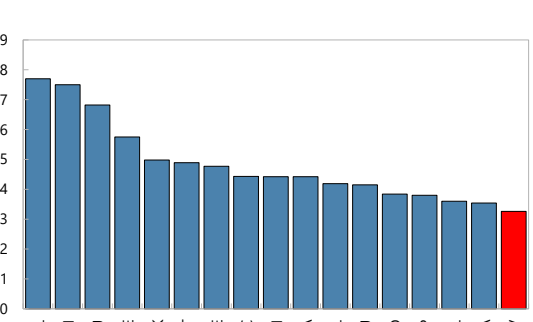


Source: Eurostat.

Average mortgage rates are relatively low, reflecting the high share of subsidized loans...

Average Mortgage Rate for EU Countries, 2023

(Percent)

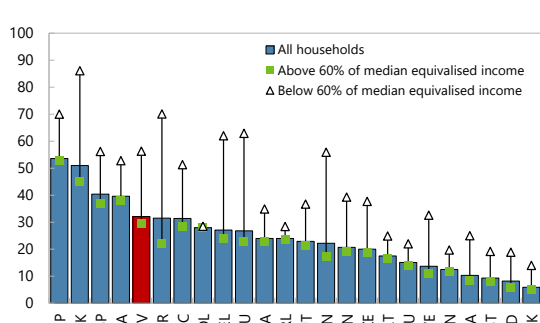


Source: Statista.

Despite relatively low mortgage rates, the financial burden of the mortgage repayment is higher than the EU average...

Financial Burden of Repayment, 2023

(Percent)

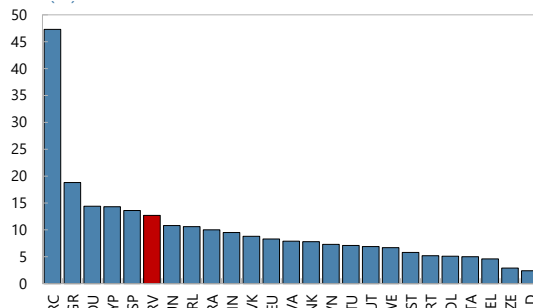


Source: Eurostat.

...and relatively large housing arrears point to rising affordability difficulties.

Arrears (Mortgage or Rent, Utility Bills or Hire Purchase), 2023

(Percent)

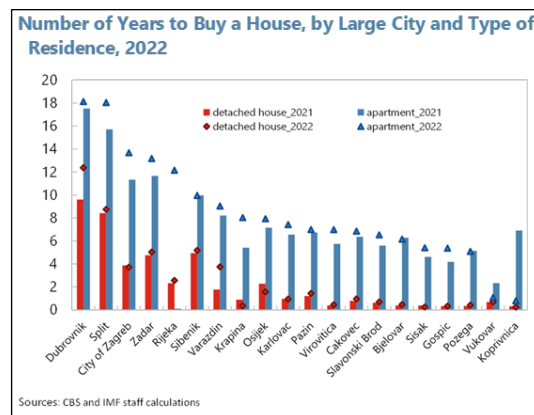


Source: Eurostat.

7. Housing quality is also an issue, which further limits affordability, via an increase in housing costs. Energy efficiency compares less well with the EU peers, contributing to relatively high rates of energy poverty. Housing energy efficiency and engineering robustness varies considerably with the age of the house. A considerable part of the stock of existing houses in Zagreb (especially those built before the 1950s) does not meet mandatory building energy codes and standards. The earthquakes in 2020 affected the already old and inefficient stock of houses.⁴ The housing stock will require renovation, maintenance, upgrade of the isolation/heating systems to reach the agreed emission targets at the EU level. Compliance with the EU rules may further increase construction costs and administrative burdens on the supply of residential structures. Price differentiation is already seen between new, energy-efficient dwellings and older ones.

8. Several measures of house price misalignment point to growing affordability concerns in Croatia.

- House price-to-inflation rate and price-to-income (PTI) and price-to-rent (PTR) ratios,** expressed as deviations from long-term averages or trend values, are the most common indicators of buyer and tenant affordability, while ignoring the role of other factors beyond price (rent) and income. The short time span (data for Croatia is only available from 2002) may distort the assessment. The deviation of real house prices, PTI, and PTR from trends in Croatia has reached 26, -9.6, and, 21 percent, respectively, by 2023Q2. While there are signs of significant overvaluation of real house prices and a widening gap between house prices and rents, PTI is still below trend, indicating that average incomes have grown at a faster pace than house prices. But there may be income distribution and regional disparities in housing affordability. For example, it took 2.3 more years of income in 2022 to afford a flat in Zagreb or Split, and 2¾ more years to afford a detached house in Dubrovnik, compared to the already elevated values one year before.
- Econometric analysis:** Staff estimates house price overvaluation as moderate at about 6 percent above the equilibrium value as of 2023Q2.
- House affordability indices:** They are based on indicators derived from micro datasets that mainly focus on income, such as the EU statistics on income and living conditions (EU-SILC), or studies that construct broader measures of housing affordability based on, e.g., the cost of financing. Croatia's housing cost overburden rates (i.e., share of costs higher than 40 percent of income)—a measure of housing affordability—is lower than the EU average, according to



⁴ Broken down by the year of construction, most occupied flats were built in the period between 1971 and 1980 (one fifth).

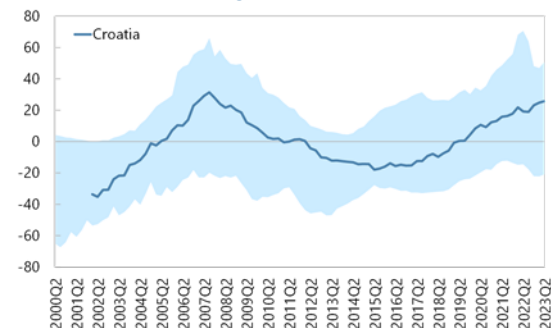
EU-SILC,⁵ reflecting considerable housing support. For each country, the House affordability Index (HAI) developed by Biljanovska et al. (2023) measures the extent to which a median-income household can qualify for a mortgage loan to purchase an average-priced home. Based on this index, affordability has improved in Croatia compared to post-GFC, but after reaching a peak in 2021, it has recently declined. With an index value of about 70 (indicating that the median-income household had a tough time obtaining a mortgage for an average-priced house), Croatia is among the worst performers in the EU. To capture regional disparities, reflecting Croatia’s appeal as a tourism destination and increased urbanization, Mikulić, et al. (2021) developed a broadly defined affordability index at the regional level and found the lowest affordability in the coastal part of the country, and the capital city Zagreb.

Figure 3. Housing Affordability Measures

Real house prices have gone up in Croatia ...

Real House Prices

Deviation from LT Average

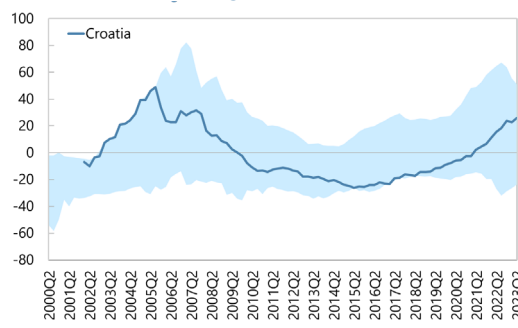


Source: IMF

...as well as the house price to rent ratio...

House Price to Rent Ratio

Deviation from LT Average

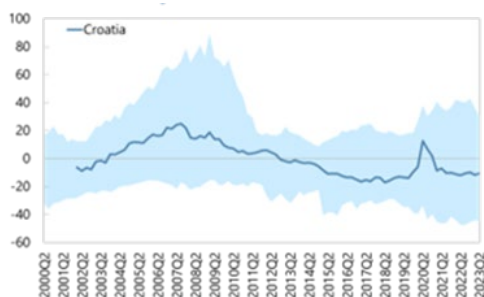


Source: IMF

House price to income ratio stays below its long-term average...

House Price to Income Ratio

Deviation from LT average

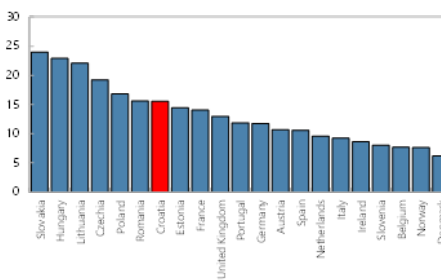


Source: IMF

...it takes about 15 years to purchase a 70 sqm house in Croatia using the median annual disposable income.

Average Number of Years to Purchase a 70-sqm New Dwelling

2023 or latest year available



Sources: EU-SILS and ECHP surveys, Statista, and IMF calculations

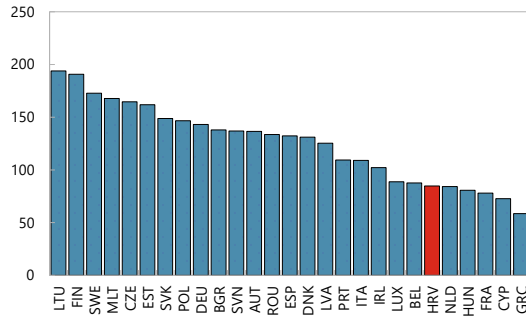
⁵ 1–2 and 3.5 percent during 2002–23 for homeowner with/-out mortgage or housing loan, compared to 4.3 and 5.1 percent for the EU, respectively.

Figure 3. Housing Affordability Measures (Concluded)

A broader-defined measure of housing affordability points to difficulties for the median-income household...

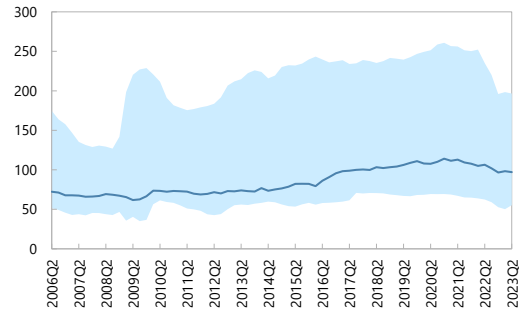
...to obtain a mortgage for an average-priced house, compared with other EU countries.

Average HAI by Country, 2006Q1–2023Q2



Source: IMF

Housing Affordability Index



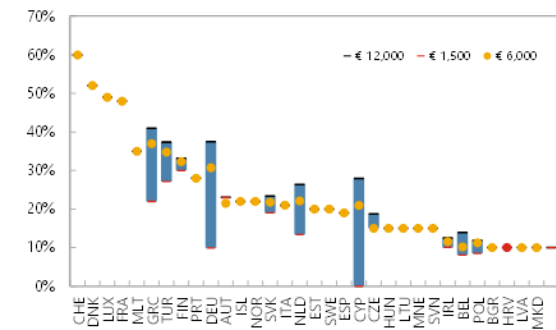
Source: IMF

C. Drivers of House Affordability: Assessing the Demand-Supply Gap

9. Taxation and tourism have contributed to pressures on housing affordability via both demand and supply.

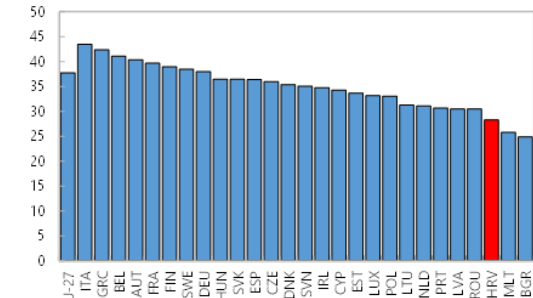
- **The favorable tax treatment of housing contributes to higher demand while reducing the supply of houses for purchase or longer-term rental.** Croatia has very favorable tax treatment of housing investments, reflected in low housing tax rates and reduced tax bases, as well as arbitrage opportunities among various income sources under the income tax (e.g., short-term rental incomes are lightly taxed with an annual lump sum tax⁶ compared to labor income, and much less than the rest of the EU). Reforming the current tax regime favoring residential real estate investments would help dampen demand, activate idle residences, enhance housing market efficiency, and encourage labor participation.

Effective Tax Rate on Rental Income for Non-Residents (Percent)



Sources: Global Property Guide, and IMF staff calculations.

Implicit Tax Rate on Labor (Percent)



Source: European Commission - Directorate-General for Taxation and Customs Union

⁶ Annual lump sum tax per number of beds per household member, while income is below a threshold.

- **The attractiveness of Croatia as a tourism destination** also contributes to overall house price increases and strong seasonality and concentration, thus fueling demand while constraining supply. Anecdotal evidence indicates that coastal residents have to or prefer moving out during the tourist season because of rising short-term rental and other tourism activity and housing affordability. Tourism activities are prone to high informality, while existing land administration system governing the registration of real property and real rights in property in Croatia (comprising the cadaster and the land registry) is not geared toward serving the tax system.⁷ Undertaxed properties do not yield sufficient revenues for LGUs thus hurting local development (such as infrastructure and public services).

10. Several factors have driven up demand for housing:

- **Higher incomes, domestically and abroad.** It is well documented in the economic literature (Wilkinson, R. 1973) that housing has a high income-elasticity of demand, with higher incomes resulting in increased demand for housing. There is a tendency to invest and save money in real estate in Croatia. Demand for secondary residences, particularly by foreigners, has also increased the cost and limited the availability of primary residences, notably on the coast and in central Zagreb (Vizek, et al., 2023; Mikulić et al., 2021). Reforms in 2009 and 2012 made buying property easier for foreign owners and online short-term rental platforms have further boosted demand. In 2021, foreign buyers accounted for more than 20 percent of the total value of purchases, especially in the high-end residential market segments. Economic growth could raise affordability issues for low-income households if their incomes do not grow in line with housing costs and prices.
- **Housing subsidy scheme for young families buying a residence for the first time (expired at end-2023).** Experience shows that housing subsidy programs of this type contribute to faster price growth especially in areas with scarce supply or typically in high demand, and cannot address housing shortages (Kunovac and Žilić, 2020). During 2017-23, the Croatian Real Estate Agency (APN) provided, once or twice a year, subsidized credit of first-time buyers, who are Croatian citizens, not older than 45 years and meet banks' qualification requirements. About 37,000 housing loans (including full use of the 2023 allocation) were subsidized during 2017-23.

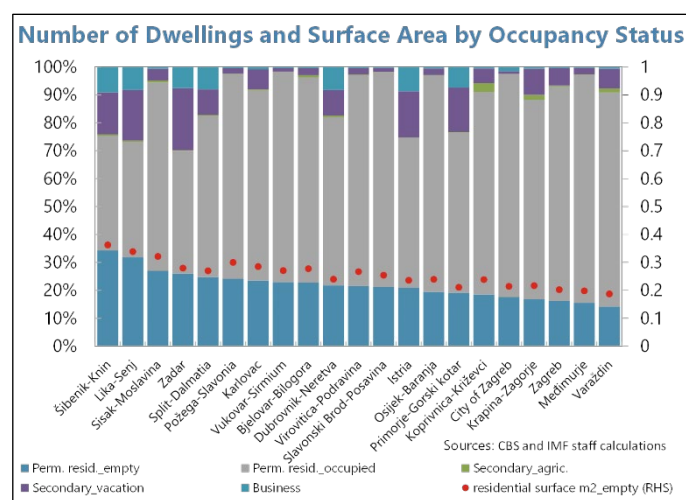
11. The housing stock, although increasing in recent years, has not kept up with demand.

- **State-subsidized housing construction program (POS),** in force for 21 years, is implemented through the construction of apartments/residential buildings for sale by installments at a more favorable price/m² (max 1.5 x standard construction price) and financing (interest below 2 percent since July 2019, 30–31-year repayment period) than the market. Commercial banks

⁷ To serve the tax system, which is one of the functions of the physical cadaster, the information on occupancy and physical characteristics of parcels (cadaster) and ownership and other real rights (land registry) should be harmonized and integrated into a unified information system at the national level, and linked with other key registers that would facilitate the assessment of the tax base and determination of credible market values of all property parcels in Croatia. The cadaster also should be able to reflect illegally built construction, for tax purposes. Increased automation, streamlining of functions, and transparency would facilitate access to data by citizens and spur the development of a better functioning real property market.

participate in the process, and are repaid before government, in the first repayment period that can last up to 21 years. There is an option for citizens to rent, then later purchase, the constructed apartments. In July 2019, POS was amended to also allow the purchase of apartments on the free market at the same favorable conditions to attract/retain deficient public sector personnel in underdeveloped areas or on islands. Since its inception, almost 9,000 apartments have been sold with a total investment value of €571 million, out of which €146 million are subsidies.

- **High and rising share of unoccupied dwellings registered as permanent residence.** According to the latest Census of Population, Households, and Dwellings (2023), there were almost 2.4 million apartments, representing an increase of 6.5 percent compared to 2011. However, the number of occupied apartments decreased by 4.2 percent, while the number of vacant apartments increased by a staggering 43 percent. Idle housing units account for about 30 percent of the existing housing stock in Croatia (about 595K units).



- **Scarcity of construction land**, most notably in the two largest cities, Zagreb and Split. There is a significant share of agricultural land that is no longer used for production and in many instances has become idle. The alienation or acquisition of privately-owned agricultural land is not regulated by a specific law. The legal procedures to consolidate land are long. Some LGUs also own centrally located land plots (brownfield, e.g., former factories) that are not put to use.
- **Construction sector characteristics, as well as skills and labor shortages** lead to higher construction cost and lower productivity. Small construction companies, shortage of skilled labor in construction, and long time to build present challenges.
- **Incomplete, out-of-date, and inconsistent cadasters and urban plans that can impede (re)development.** Real estate data is generally fragmented.⁸ Close cooperation among several institutions that are dealing with different aspects of land registration, ownership, and market values is essential to establishing comprehensive and accurate legal and geodetic property registers. The physical cadaster covering the total surface area of Croatia is managed by the SGA (within the Ministry of Urban Planning and Construction), except the City of Zagreb which has its own Cadastral Office. The land registry is within the municipal courts (Ministry of Justice). An added difficulty comes from the fact that although the whole country has been surveyed, a significant share of parcels in the cadaster do not reflect accurate data on ownership and are not

⁸ Some data can be found in the Ministry of Finance (sales transactions), the Croatian Bureau of Statistics (average sale prices, data on housing units and dwellings), Ministry of Justice (land registry), State Geodetic Administration (SGA) (cadastral data), and LGUs (property and ownership databases).

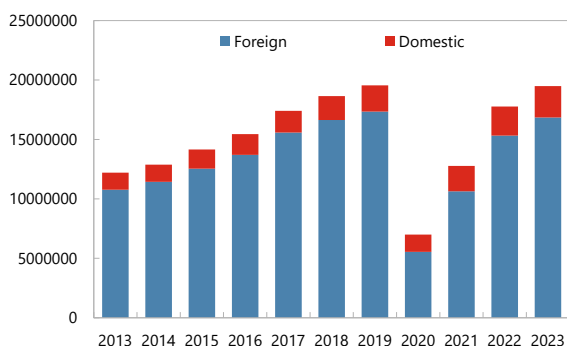
harmonized with the land registry. The change of urbanistic planning and zoning is proceeding slowly, and the last change for Zagreb took place in 2016.

12. A thin private rental market serving the tourism industry makes housing supply more price inelastic. At about 8 percent of total dwellings, the share of resident households living in rented houses is among the lowest in the EU. Nevertheless, on average, private rentals account for 2/3 of all tourist accommodations in Croatia (higher in locations with stronger tourism seasonality), making housing supply more price inelastic relative to tourism destinations where hotels/other collective accommodations dominate. Recent house price increases led to an increased demand in the rental segment as a proportion of the residents decided to delay their purchase of a home and instead decided on renting (EIZ, 2023). However, the long-term rental market is small. Most long-term rental properties are in Zagreb, Dubrovnik, and Split. The Adriatic coast is the core of short-term demand, concentrating on short-term holiday rentals.

Figure 4. Supply and Demand Factors

High foreign arrivals translate into high foreign demand for housing investments.

Tourist Arrival

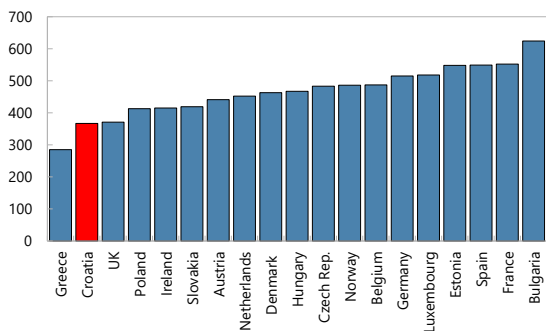


Source: Eurostat

Croatia has the second lowest housing stock in the EU, pointing to overcrowding.

Housing Stock

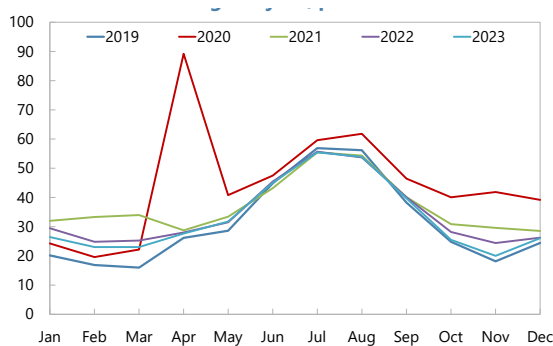
Number of dwelling per thousand inhabitants, 2022



Sources: Statista, Croatian Bureau of Statistics, IMF staff calculations

Short term rentals account for almost 1/2 of tourist arrivals in high season.

Share of Arrivals at Holiday and Other Short-Stay Accommodation During the Year, Percent of Total

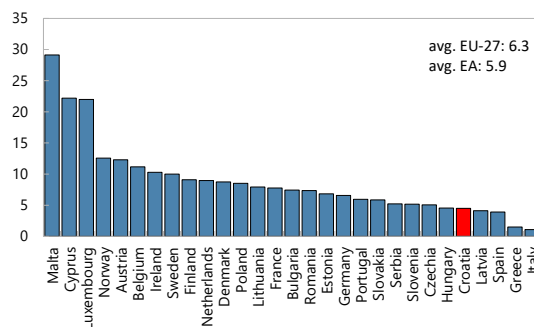


Source: Eurostat

Housing development progresses at a very low pace.

Housing Development Intensity. 2022

Average building permits for 70sqm dwelling per thousand inhabitants, 2014–2022



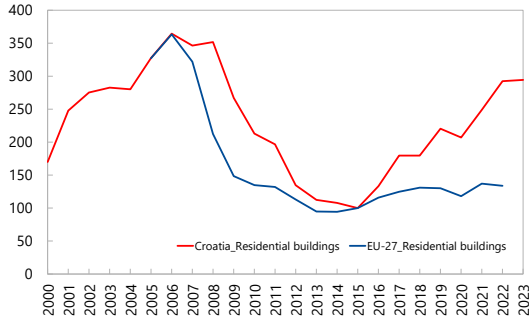
Sources: Eurostat and IMF staff calculations

Figure 4. Supply and Demand Factors (Concluded)

Building permits are below previous peaks...

Building Permits, PSQM

(Index 2015 = 100)

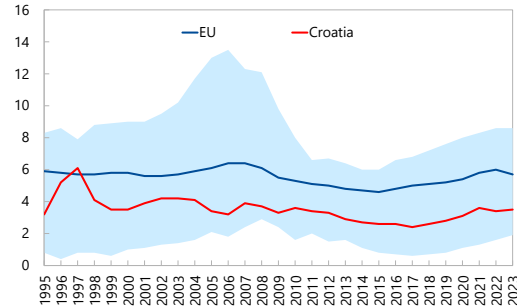


Source: Eurostat.

...while residential construction is advancing at a slow pace.

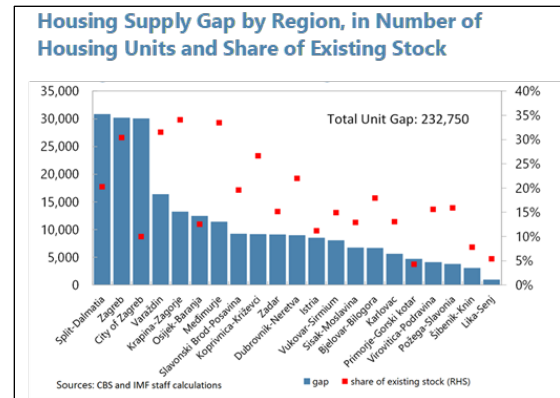
Residential Construction at Share of GDP

(Percent of GDP)



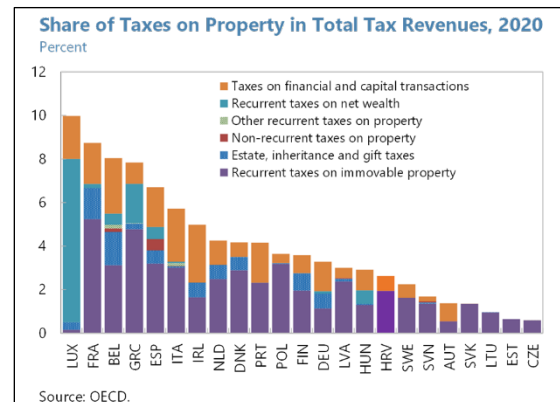
Source: Eurostat. Shaded area refers to EU countries' range.

13. Estimating the housing supply gap. Even accounting for the falling population in all regions, besides the greater Zagreb area, the total number of dwellings fell below 400 per 1,000 inhabitants as of 2022. The 2020 earthquakes damaged over 35,000 buildings, rendering over 10,000 dwellings at least temporarily unusable, equivalent to 0.6 percent of the national housing stock. The housing supply gap, by region and overall, is measured as the difference between the actual occupied housing stock and the housing stock that would bring Croatia's household size down to the EU average (from 3.0 to 2.7), reflecting unfulfilled demand for housing (e.g., from the young and the low-income). We estimate a gap of 232,750 units, or 16 percent of the existing housing stock. The pace of annual construction, measured by the number of residential housing permits, has been at about 2 million sqm, translating into about 28,500 of 70 sqm units per year. On the other hand, there are estimated 595,000 vacant properties in Croatia.



D. Policy Options and Recommendations

14. The tax treatment of residential real estate has important implications for the wider economy. It affects the incentives to invest in housing relative to other forms of investment, labor mobility and participation, house use, and house prices (OECD, 2022). Despite its importance for housing affordability and fiscal policy, Croatia has not undertaken significant reforms to improve the design of real estate taxation in the last decades. The potential of recurrent taxes on immovable



property remains largely untapped, relative to the rest of the EU. Currently, residential and commercial immovable properties are not subject to a recurrent market value-based property tax. Instead, Croatia imposes an annual area-based tax on a relatively small number of vacation homes or cottages for temporary use during summer.⁹ There are also transfer taxes on change of ownership (sales, inheritance, and donations). Revenues from taxes on property in Croatia are negligible.

Table 1. Croatia: Housing Taxation Over the Life of Investment

Acquisition		
Transaction tax	3%	Purchase of new properties are taxed VAT (25%) and no real estate transaction tax.
Holding		
Income tax (final income)		
residential purposes	12%	30 percent lump-sum deduction of tax base (rental fee) for expenditure.
touristic purposes	€20-€200/year/bed	Annual Flat Rate Tax applied to number of beds/accommodation units. For revenues below €40,000, short-term rent income is deemed income from property, hence VAT exempt; above the threshold it counts as independent personal services liable to charge and remit VAT.
companies	10-18%	Business income such as rental income and capital gains are subject to corporate income tax. Rental income is subject to VAT (25%) if the rented object is located in Croatia. Providing accommodation services is taxable at 13%. Rental income for residential purposes is VAT exempt.
Mortgage interest relief		POS: One-off tax relief for home buyers
Property tax	N.a.	No annual real estate tax. Only the ownership of holiday homes (secondary residences) is taxed, regardless of whether the owner is an individual or a company, or a resident or a non-resident. The tax on holiday homes is set in the range €2-5 per sqm of usable floor area by the relevant LGU and is paid annually. Other small local taxes include an utility charge per sqm and a communal fee.
Net wealth taxes	N.a.	
Disposal		
Capital gains taxes	24%	Exemption for holding the property longer than two years.
Inheritance and gift taxes	3-4%	Inheritance and gifts are exempt from taxation in the first line of succession.

Source: European Commission - Taxes in Europe database and Croatian Tax Administration Office.

15. Croatia needs a modern, well-designed property tax to replace—fully or in part—the present fragmented system of square meter-and transfer-based taxes and fees, which lacks transparency, fairness, and revenue-raising capability for local governments. A tax based on market-value could induce a substantial improvement in the use of land and would, furthermore, enable a move away from more distortionary taxes such as high social taxes and property transfer taxes. It would also enhance accountability at the LGU level. Although reduced in 2019, the property transaction tax is levied on housing purchases at a relatively high rate, even though this type of taxes is recognized to be highly distortive and may reduce housing market efficiency and hinder

⁹ The tax on vacation homes is an optional tax on houses for occasional use; LGUs independently decide on its introduction within the rates provided for in the Law on Local Taxes. It ranges from 0.60 to 5.00 euros/m² of the useful surface. As of 2023, 1/10th of total dwellings was occasionally used for vacation, generating 0.03 percent of GDP.

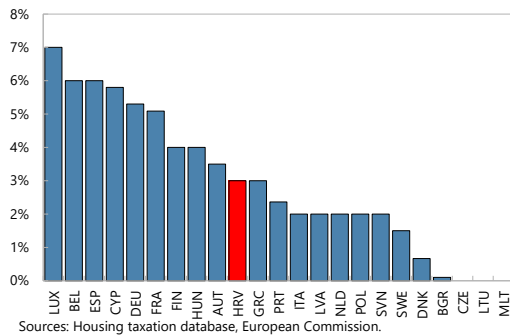
worker mobility. It could be lowered to facilitate transactions. The incomplete, and in some respects inaccurate or non-existent, land registry should not prevent property tax reform in the short term, as the experiences of other Central, Eastern and Southeastern European (CESEE) countries have shown (e.g., Bosnia and Herzegovina, Montenegro, Romania, and Slovenia).

16. Personal income tax (PIT) equity should be improved, particularly by removing the excessively favorable taxation on short-term rental income. The effective tax rate on rental income for nonresidents is the lowest in the EU. The authorities should make sure that taxation and regulation of short-term rentals are neutral by comparison with other sources of income to avoid the excessive conversion of dwellings away from long-term residential uses. Ensuring that any reforms treat investments in private rental housing and owner-occupied housing equivalently would help develop a bigger rental market.

Figure 5. Taxation of Housing in Croatia

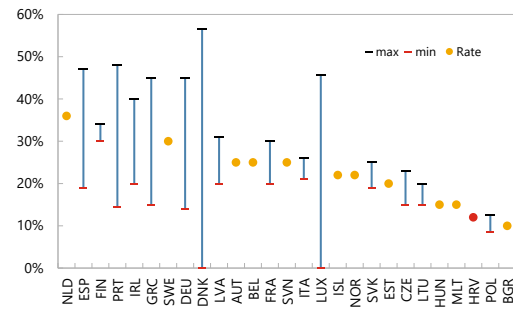
Transaction tax was lowered from 5 to 3 percent in 2019 and only applies to old residences.

Real Estate Tax
(Latest available percent)



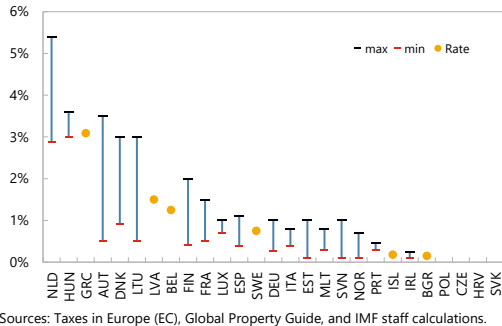
Croatia has one of the lowest PIT for rental income. As of 2023 LGUs are free to set their own PIT range, around the previous 12 percent plus surtax rate.

Tax on Rental Income (Resident Individual Taxpayer)
(Percent)



Croatia has no recurrent tax on immovable property.

Recurrent Tax on Immovable Property
(Percent)



Rental income for companies is taxed at Corporate Income Tax (CIT), which is progressive (in the 10-18 percent range)

Corporate Income Tax
(Percent)

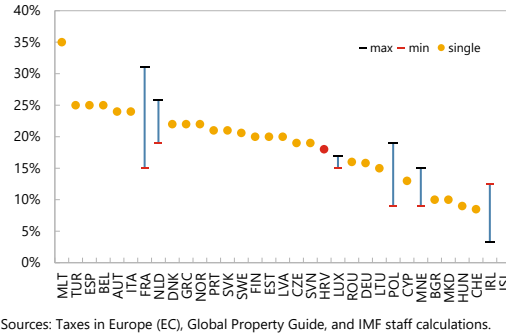
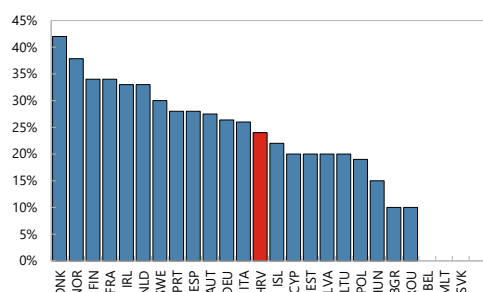


Figure 5. Taxation of Housing in Croatia (Concluded)

Capital gains tax has recently been increased but remains lower than the EU average...

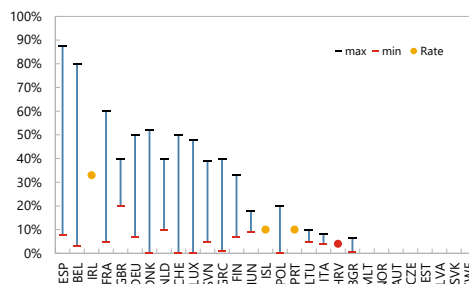
Inheritance and gift taxes are low and subject to exemptions.

Capital Gains Tax from Sale of Immovable Property



Sources: Taxes in Europe (EC), Tax Foundation database, and IMF staff calculations

Estate Taxes, Inheritance Taxes and Gift Tax Levies (Percent)



Sources: OECD, Worldwide Estate and Inheritance Tax Guide 2022, and IMF staff calcul

Box 1. Croatia: Introducing a Modern Recurrent Property Tax in Croatia¹

A modern value-based and revenue neutral property tax would help rebalance the existing tax structure toward a more neutral and efficient tax system. It can be introduced in two phases:

In the near term, building on existing data registers, transform the communal fee into an elementary, more equitable value-based property tax, by recalibrating the coefficients for zoning and property use (and possibly expanded by property age/quality criterion)² to better capture actual market values. The communal fee will become a “benefit tax” at the local level, levied on the broadest possible set of property that benefits from local government services (e.g., infrastructure, education, healthcare). Its earmarking should be abolished, becoming a true own-revenue local tax. Existing exemptions should be curtailed, to have the broadest tax base possible, which would allow for the lowest possible rate levels.

The benefit rate can initially be set at a level that at least offsets the decline in revenues from the repeal of the vacation homes tax and lower transaction tax, then evolving to approximate market values. The transaction tax could offer important information on property market values during this phase.

A working group could be set up at the Ministry of Finance with participation of relevant stakeholders, to prepare property tax discussion documents, legal drafts, guidelines for revision of coefficients by LGUs. Measures to shield low-income households from adverse impacts of reform should also be prepared early on.

Over the medium term, move to a full-fledged value-based and revenue-neutral property tax, following completion of the necessary technical and legal preparations, including title register and fiscal cadaster. Best international practice shows that a flat uniform rate should be applied to a base with a minimum of exemptions, with a uniform treatment of business and residential property.

Measures to shield low-income owners from potential adverse impacts of the property tax include adopting a tax threshold expressed in value (possibly supplemented by special tax deferral rules for the elderly and for cases of unknown ownership), which would at the same time enhance the progressivity of the tax.

It is important to complete the necessary administrative infrastructure, based on a central cadaster with accurate and up-to-date information on property coordinates and ownership, supported by a modern and comprehensive property revaluation system, including clear appeals procedures. Tax provisions could be considered in cases where individuals or companies own multiple properties, possibly located in different municipalities.

Box 1. Croatia: Introducing a Modern Recurrent Property Tax in Croatia¹ (Concluded)

Local governments could be incentivized to make fuller use of property taxes through reductions of intergovernmental transfers, and/or by prescribing a band for the tax rate. Local governments with limited capacity to develop and maintain an administrative system for the collection of the communal fee may decide to outsource this task to the Tax Administration.

¹ Based on Norregaard, et al. (2012).

² The current communal fee, while resembling a rudimentary property tax in its objectives, has several design weaknesses. For example, the coefficient for the use of property is skewed toward taxing commercial versus residential properties and does not consider the age nor the quality of the building. Being locally administered, the property and ownership databases, upon which the communal fee relies, are generally incomplete and not properly updated.

17. Policies to improve affordability need to address the underlying supply gap in housing.

- **Accelerate the modernization of the legal cadaster.** The government is undertaking a welcome consolidation of the cadaster under the National Recovery and Resilience Plan (NRRP). There is a need for further improvements to the quality of the land registry and cadaster data and to link the data in the Joint Information System to other key registers (e.g., PIN, addresses). The two IT systems exist in parallel within two different ministries. There is a need to harmonize data in the cadaster and land registry, update it to reflect the reality, and finalize merging the data into a single database.
- **Make better use of the existing vacant space (housing and land).**
 - **The existing housing stock should be modernized.** New construction is not the only way to bring supply in line with demand. The renovation and upgrading of the dwelling stock can help match demand and reduce vacancy rates. Carbon pricing revenues can be recycled to subsidize the retrofitting of existing housing, in addition to the use of EU funds, and create incentives for homeowners to comply. For example, subsidies could be introduced for the energy-efficient renovation of old buildings to expand the use of housing stock and its energy performance. Ensuring that repairs and reconstruction of buildings damaged by the 2020 earthquakes improve their energy efficiency, and transitioning heating and cooling systems to renewable energy sources can accelerate energy savings.
 - **Croatia should take stock of vacant properties—including public buildings—and identify and reduce the disincentives that create the vacancies.** Measures to further encourage owners to make use of their properties can include: (i) higher property taxation on non-primary residences (as in Austria) or tax surcharges on vacant dwellings in big cities (as in France, Ireland, Israel, and United Kingdom), accompanied by penalties and credible enforcement; (ii) shifting some housing subsidies that favor high-income homeowners toward private investment in rental housing development; (iii) limitations on short-term vacation rentals. Furthermore, measures that make use of the vacant land can consider: (i) convert unused commercial real estate into affordable housing (as in France); and (ii) “gentle

requisitioning” and conversion supported by fiscal incentives of underused or abandoned facilities into social housing (as in Belgium, Germany, and Italy).

- **All land not covered by the new property tax should be subject to a simple area-based land tax, the yield of which can accrue to the central government to co-finance the modernization of the cadaster.** As an incentive to consolidate the numerous small plots of land, a tax holiday of 3-5 year could be considered, which would exempt from the transfer tax any land transactions that clearly serve land consolidation purposes (Norregaard et al., 2012).
- **Invest in green social housing and public infrastructure.** Investing in green social housing construction, directly by the LGUs or indirectly through non-profit or reduced profit associations (as in several U.S. states) can improve affordability for low-income households. For eligible low-income tenants, eligibility should be portable to increase labor mobility (e.g., vouchers portability in Maryland). Furthermore, the development and sustainability of residential areas rely on good infrastructure (public transport, water, energy, and public spaces) and accessibility of essential community services (European Commission, 2019)
- **Streamline regulations.** Easing and simplifying land use regulations as well as accelerating rezoning and administrative processes can enable housing development. The geographic boundaries on urban development could be regularly evaluated. Croatia does not have a national urban planning policy, which hampers the real estate market and housing supply. The coordination between different government levels to reconcile the objective of housing affordability and environmental preservation could be improved. Furthermore, converting brownfield land for affordable housing can be an effective way to develop urban areas and revive abandoned spaces in/around Zagreb while reducing the need for greenfield development which preserves undeveloped land and reduces urban sprawl.

18. Efforts should be made to facilitate the development of the longer-term rental market.

Investment in affordable rental housing can counteract socioeconomic divergences, facilitate access to employment across locations, boost employment in the short term, and lower carbon emission if investment targets greater energy efficiency. Measures to boost the rental housing stock and access to it could consider: (i) targeted income support programs (housing allowances or vouchers); (ii) targeted regulations (as in Germany, where the use of dwellings for nonresidential purposes was prohibited in some high-density areas); (iii) tighter rules on short-term rentals (such as Airbnb)—as adopted in Berlin, Barcelona, Dublin, and Paris; (iv) review of renter–landlord regulations. If not adequately balanced (e.g., excessively restricting evictions), balancing the rights could increase rental housing supply.

19. Demand-side interventions need to be very limited in size and narrowly targeted at specific disadvantaged groups.

Measures such as subsidies, even if well targeted, tend to be effective only in the short term, as they at least partially contribute to higher house prices or rental costs over the medium term. Support to households for homeownership, particularly mortgage interest deduction, tends to be non-targeted and regressive, benefiting mainly high-income

households with better access to mortgages (Elfayoumi, 2021; OECD, 2020). It is important that measures aimed at facilitating household and corporate financing target construction of new homes or retrofitting of existing low-quality houses to avoid fueling demand pressures against a very limited housing stock, thus pushing prices up and worsening affordability.

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