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**THE LINK BETWEEN THE PRICE AND COST  
COMPETITIVENESS AND ECONOMIC ACTIVITY BEFORE AND  
AFTER JOINING THE MONETARY UNION: EXAMPLES FROM  
CROATIA, A HIGHLY DOLLARIZED SMALL OPEN ECONOMY**

**POVEZANOST CJENOVNE I TROŠKOVNE KONKURENTNOSTI  
S EKONOMSKOM AKTIVNOSTI PRIJE I NAKON ULASKA  
U MONETARNU UNIJU: PRIMJERI IZ HRVATSKE, VISOKO  
EUROIZIRANOG MALOG OTVORENOG GOSPODARSTVA**

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**ABSTRACT:** This paper examines the main channels linking price and cost competitiveness to economic activity in a small open, highly dollarized economy (Croatia) before and after joining the monetary union. The discussion in the paper suggests strongly altered transmission mechanisms between competitiveness and output, including the link between exchange rate and economic activity: 1) the trade channel is now less effective, 2) balance sheet effects, which used to be pronounced due to high euroization, have been strongly dampened; 3) the exchange rate pass-through may also be weaker. The relationship between unit labor costs and the exchange rate has also changed significantly. The paper emphasizes that the importance of price and cost competitiveness may increase after joining the eurozone. Without a significant shift towards high-technology exports, which are less cost-sensitive, and increasing energy independence, there is an increased risk that Croatia's export performance will be affected by cost pressures. In this environment, efficiency gains, investment in human capital, innovation, non-price competitiveness and energy independence must be prioritized. Such measures are essential to reduce cost dependency and maintain long-term economic growth.

**KEY WORDS:** price and cost competitiveness, dollarization, monetary union

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**SAŽETAK:** Ovaj rad ispituje glavne kanale koji povezuju cjenovnu i troškovnu konkurentnost s gospodarskom aktivnošću u malom, otvorenom i visoko euroiziranom gospodarstvu (Hrvatska), prije i nakon ulaska u monetarnu uniju. U raspravi u radu ističu se znatno izmijenjeni transmisivni mehanizmi između konkurentnosti i gospodarske aktivnosti, uključujući vezu između deviznog tečaja i outputa: 1) kanal vanjske trgovine sada je manje učinkovit; 2) bilančni učinci, prethodno izraženi zbog visoke euroizacije, znatno su oslabljeni; 3) prijenos varijacija deviznog tečaja na cijene također može biti slabiji. Veza između jediničnih troškova rada (ULC) i tečaja također je značajno izmijenjena. Rad naglašava da bi važnost cjenovne i troškovne konkurentnosti mogla biti povećana nakon pristupanja europskom području. U odsustvu značajnog pomaka prema izvozu proizvoda više tehnologije, koji su manje osjetljivi na troškove, i povećanja energetske neovisnosti, postoji povećani rizik da će izvoz biti pod utjecajem troškovnih pritisaka. Ovo okruženje zahtijeva usmjeravanje na povećanje produktivnosti, ulaganje u ljudski kapital, inovacije, necjenovnu konkurentnost i energetske neovisnost. Takve su mjere ključne za smanjenje ovisnosti o troškovima i održavanje dugoročnog gospodarskog rasta.

**Ključne riječi:** cjenovna i troškovna konkurentnost, dolarizacija, monetarna unija

## 1. INTRODUCTION

Price competitiveness reflects the ability of a firm, an industry or a country to offer a product at favourable prices compared to its competitors, while cost competitiveness refers to the ability to produce at lower (unit) costs. These two types of competitiveness are closely linked and both can have far-reaching effects on economic growth and macroeconomic stability. Understanding how price and cost competitiveness drive economic activity is crucial for macro-financial stability and the prevention of future financial and economic crises.

Competitiveness affects the economy through multiple, interlinked and simultaneous transmission channels. To explore this relationship, one should analyse the transmission channels between output and variables that (approximately) represent price and cost competitiveness. This paper examines the main channels linking price and cost competitiveness to economic activity in a small open, highly dollarized economy (Croatia) before and after joining the monetary union, through exchange rate changes (important determinant of price competitiveness) and unit labour costs (ULC; important determinant of cost competitiveness).

The discussion in the paper points to greatly changed relationships between the exchange rate and economic activity in Croatia after joining the eurozone: 1) the trade channel, an important transmission mechanism, is now less effective; 2) the balance sheet effects, which used to be pronounced due to high euroization, are greatly dampened; 3) the exchange rate pass-through, which is now primarily linked to the euro-dollar exchange rate, may also be weaker. In addition, the relationship between ULC and the exchange rate has changed significantly.

Despite these shifts, price and cost competitiveness remain crucial to sustaining economic growth, especially within the monetary union where exchange rate adjustments are no longer possible. Croatia's simultaneous entry into the eurozone and Schengen Area may have strengthened price signals, further reduced trade barriers and lowered transaction

costs possibly increasing the sensitivity of exports and overall economic activity to relative costs and prices.

Without a significant shift towards high-technology exports, which are less cost-sensitive, Croatia faces an increased risk that export performance will be affected by cost pressures. In this environment, efficiency gains, productivity improvements and investment in workforce skills, innovation and non-price competitiveness must be prioritized. Such measures are essential to reduce dependence on costs and maintain long term economic growth.

Since domestic prices and economic activity are highly dependent on foreign variables, domestic policy measures can only be of limited effectiveness in counteracting external cost shocks. It is therefore necessary to reduce the vulnerability of domestic prices and output to foreign shocks. To achieve this, efforts must be made to increase energy independence, switch to renewable energy sources and stabilize energy prices. Pursuing these initiatives at EU level can increase their impact and promote greater economic stability.

The paper also addresses gaps in the literature and points to future research to deepen the understanding of the link between price and cost competitiveness and economic activity in Croatia. While the exchange rate has been studied extensively, there has been less focus on export prices, labor costs (including unit labour costs, ULC) and detailed sector-specific analysis. As relative costs and prices become increasingly important in shaping economic outcomes, research should prioritize these areas. Microeconomic data in particular could provide valuable insights into these dynamics and help answer important questions.

## **2. UNDERSTANDING THE LINK BETWEEN PRICE AND COST COMPETITIVENESS AND ECONOMIC ACTIVITY IN A HIGHLY DOLLARIZED ECONOMY**

Price competitiveness in an economy depends on a large number of variables. It can be roughly divided into cost-related factors (cost competitiveness) and those that are not (directly) related to costs. Cost competitiveness is particularly important as costs have a direct influence on supply and therefore also on prices. The most important factors of cost competitiveness include labor costs and labor productivity (reflected in ULC) as well as the costs and productivity of other inputs such as materials, energy and capital. In addition, factors such as the quality of infrastructure, human capital, technology and operating costs, including regulatory burdens and tax policies, play an important role.

In addition to costs, other structural and macroeconomic factors also determine price competitiveness. These include tariffs, non-tariff barriers and other trade-related frictions, as well as macroeconomic stability, global supply chain integration, the regulatory environment, and market power. The interplay of these elements creates a complex and dynamic framework that ultimately determines the competitiveness of goods and services in both domestic and international markets.

It is crucial for policy makers to understand the relationships between cost and price competitiveness and their broader determinants. Such insights help in formulating strategies to improve national competitiveness, enabling economies to thrive in an increasingly interconnected global marketplace.

## 2.1. Exchange Rate Changes and Price Competitiveness

Changes in price competitiveness affect both the financial and real sectors of the economy through interconnected channels. These channels vary in importance depending on a country's economic characteristics, institutional framework and industry structures. An important factor affecting price competitiveness in a small open economy is the exchange rate, which affects both demand and supply by influencing prices and production costs.

The transmission channels of exchange rate changes to economic activity in a small open economy include the foreign trade channel (which is related to the Marshall-Lerner condition), the balance sheet channel (which affects the net worth of domestic sectors) and the price channel (which is related to exchange rate pass-through effect).

Of these channels, the trade channel has been studied most extensively. This channel is particularly important for countries with high trade openness, such as Croatia. If the Marshall-Lerner condition is met, a real depreciation of the domestic currency improves the trade balance. Research consistently shows that a long-term real depreciation has a positive effect on the Croatian trade balance, although the existence of the J-curve effect remains controversial (see references in Novinc, 2023).

Domestic studies on price competitiveness have mainly focused on the trade balance channel. They generally identify the real exchange rate, relative prices and export prices as important predictors of exports (Mervar, 1994; Erjavec & Cota, 2005; Bobić, 2010; Bošnjak, Novak & Bašić, 2020; Orsini & Perić, 2021). However, some studies find that the real exchange rate is not significant (e.g. Bilas, Bošnjak & Novak, 2014; Levaj, 2022). Among the new EU member states, Croatia stands out, as Jakšić & Žmuk (2014) emphasise the real exchange rate as a key long-term determinant of exports.

The effects of changes in the real exchange rate vary depending on the sector. For example, Bogdan, Cota & Rogić (2015) find that a depreciation significantly improves the export performance of Croatian low and medium-low tech manufacturing, but has no significant impact on medium-high and high-tech sectors. Similar results are reported by Tkalec & Vizek (2009), which show the greater importance of maintaining price and cost competitiveness in lower technology manufacturing sectors.

Next, exchange rate fluctuations have an impact on a country's financial sector, e.g. through changes in bank balance sheets, interest rates, real estate prices and future exchange rate changes. Interest rates rise as a result of currency weakening, partly due to uncovered interest rate parity. Higher interbank interest rates have an impact on other interest rates and can affect economic activity (Nadoveza Jelić & Ravnik, 2022).

A currency depreciation increases the cost of imported goods, both consumer and intermediate ones. Thus, exchange rate fluctuations affect domestic prices via internationally traded goods, with the final effect depending on domestic inflation processes and the indirect effects of exchange rate changes, namely the impact on non-tradable goods and services (Carstens, 2019) and the relationship between prices and wages (Bank for International Settlements, 2019)<sup>1</sup>. Since prices affect the purchasing power of households, the

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<sup>1</sup> For example, before Croatia joined the eurozone, the bilateral exchange rate between kuna and euro was an important determinant of domestic inflation, as the stability of this exchange rate helped manage

effects of exchange rate changes on prices can spill over to real variables in the short term, especially if there are nominal rigidities (Nadoveza Jelić & Ravnik, 2022)<sup>2</sup>.

In addition to trade channel and effect on prices, the balance sheet channel is another important mechanism through which exchange rate changes affect economic activity. A depreciation increases the repayment burden of loans denominated in a foreign currency (or with a currency clause), which reduces domestic demand. This effect is particularly strong in economies with high levels of foreign currency debt, such as Croatia before joining the eurozone.

Depreciation also leads to a redistribution of wealth by increasing the real income of net savers in foreign currency, while increasing the debt burden for net borrowers. For private households, these effects are often indirect, as they are felt through changes in the balance sheets of firms and governments, which are usually net borrowers.

A depreciation can also have a positive effect on exporters whose prices are denominated in foreign currency. A weaker national currency increases the value of exports in local currency, which boosts profits and potentially leads to higher investment and more employment (Bank for International Settlements, 2019). But in a highly dollarized countries depreciation raises the real debt burden, such as in Croatia before joining the European Monetary Union. These balance sheet effects were found significant, and depreciation had a negative impact on economic activity, as shown in Tkalec & Verbič (2013) and Nadoveza Jelić & Ravnik (2022).

That said, currency depreciation can also have contractionary effects on economic activity, especially in heavily dollarized or euroized economies. Studies from Croatia from the last two decades point to the negative effects of currency depreciation, mainly due to the increased debt burden for sectors that are net borrowers in foreign currency, namely firms and the government (Nadoveza Jelić & Ravnik, 2022; Novinc, 2023). In small open economies, models such as Mundell-Fleming suggest that appreciation increases returns on domestic financial assets and attracts capital inflows, but at the same time reduces net exports and output.

However, the effects of exchange rate changes vary depending on whether bilateral or effective exchange rates are involved. Hofmann, Shim & Shin (2020) show that an appreciation of the nominal effective exchange rate has a negative impact on net exports and growth, tightens financial conditions and reduces output. Conversely, a bilateral appreciation of the exchange rate against the US dollar is often associated with a reduction in risk premia and capital inflows. For emerging economies that are highly indebted in US dollar, an appreciation of the bilateral exchange rate increases the value of domestic assets relative to foreign assets and reduces the real burden of foreign debt and risk premia, thereby lowering returns on financial assets and stimulating output.

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import prices and inflation expectations, with the credibility of monetary policy being essential for controlling inflation.

<sup>2</sup> This is related to the exchange rate pass-through (ERPT), which can be defined as the percentage change in prices — whether import, producer, export or consumer prices — that results from a one percent change in the exchange rate. Empirical studies estimating the ERPT for Croatia, including Billmeier & Bonato (2004), Tica & Posedel (2009), Jovičić & Kunovac (2015), Kurtović et al. (2018) and Ortega & Osbat (2020), indicate that the pass-through effect is incomplete, i.e. less than 1:1.

## 2.2. Unit Labour Cost, Cost Competitiveness and its Connections with Exchange Rate

Unit labor cost (ULC) is a widely used measure of cost competitiveness. It is usually calculated as the ratio of compensation to output or compensation per employee to labor productivity. Domestic studies often use ULC as an indicator of cost competitiveness, as they are related to price competitiveness and interact with exchange rate dynamics<sup>3</sup>.

Currency depreciation can affect ULC through several mechanisms. One direct effect is the impact on consumer prices. The loss of purchasing power, i.e. lower real wage caused by higher import prices can prompt workers to demand higher wages, which increases ULC. In response, central banks may intervene to stabilize the economy and mitigate potential effects on ULC and price stability.

The depreciation also increases the cost of imported inputs, to which firms may respond in different ways. Some might raise product prices (most of them do), or reduce output and sales volumes thereby increasing ULC. Others might reduce labor costs by cutting wages or employment, which would lower ULC. Alternatively, companies may reduce non-wage labor costs, which do not directly affect ULC, or limit sales in less profitable markets, which has a tendency to increase ULC.

If the Marshall-Lerner condition is met and there are no capacity constraints, depreciation increases exports (and output), which tends to lower ULC. However, higher exports require more inputs, including labor. If labor is available, employment and wages may increase, partially offsetting the decline in ULC. If there are capacity constraints or labor shortages, the effects on ULC could be different.

In heavily dollarized economies, currency depreciation also affects the balance sheets of economic sectors. While some households reduce their consumption due to the rising debt burden, others could act conversely. At the same time, the increase in government debt caused by the depreciation can trigger a fiscal consolidation, which might have a contractionary effect and lead to a decline in production and employment. Companies may also cut back on investment and sales, further impacting ULC. Given these complex dynamics, the net movement of the ULC post depreciation is difficult to predict.

The causality between ULC and exchange rates can also work in the opposite direction. Labor costs affect economic activity and labor markets through different channels, depending on the institutional and structural characteristics of the economy. Since labor costs account for a significant share of production costs, higher ULC often leads to rising prices. Companies can pass these costs on to consumers, which can lead to a decline in output.

A rapid rise in labor costs can also indicate inflationary pressures, causing central banks to tighten monetary policy, which in turn can affect the exchange rate. A sustained rise in gross wages and salaries without accompanying increases in productivity can undermine competitiveness and profitability, discourage foreign investment and weaken the currency. The link between ULC and exchange rates is also illustrated by the real exchange rate deflated by ULC, which is an important indicator of price and cost competitiveness.

<sup>3</sup> Although used as an indicator of competitiveness, ULC has some serious limitations and drawbacks (see Felipe & Kumar, 2014), and aggregate ULC differs a lot from firm-level ULC (see Novinc, 2024).

In a broader sense, the rise in ULC has far-reaching economic implications. A wage-induced rise in labor costs can stimulate private consumption, but higher prices due to rising costs can offset this and reduce consumption. An increase in labor costs caused by productivity losses can lead to higher prices, lowering consumption and investment. Rising ULC also affects export prices, business investment and demand for labor.

### **3. THE CHANGING LINK BETWEEN THE EXCHANGE RATE, UNIT LABOUR COST AND ECONOMIC ACTIVITY IN CROATIA**

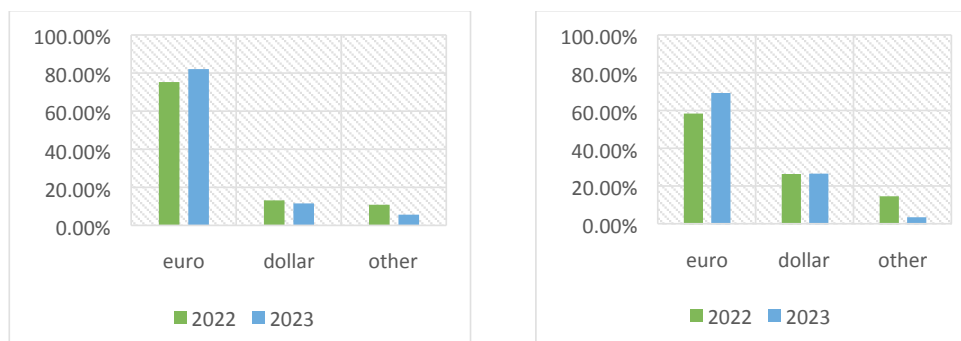
The discussion about price and cost competitiveness remains relevant even after Croatia's accession to the eurozone. Although this change in the monetary system was significant, it was not dramatic given Croatia's previous rigid exchange rate policy and limited fluctuations against the euro. However, as analysed in this chapter, joining the European Monetary Union (EMU) changed important transmission mechanisms between the exchange rate, unit labour costs (ULC) and economic activity. In particular, the exchange rate is no longer an instrument of economic policy, but an exogenous variable. Nevertheless, the exchange rate continues to affect exports and economic activity, as not all imports and exports are invoiced in euros.

#### **3.1. Exchange Rate Changes and Economic Activity After Joining the Eurozone**

Some transmission channels between the exchange rate and economic activity have changed significantly after Croatia's accession to EMU, especially those related to the bilateral exchange rate between the kuna and the euro. The publicly available data do not allow a detailed analysis of the currency composition of Croatian exports and imports. Although the Croatian Statistical Office collects data on trade with EU (Intrastat) and non-EU countries (Extrastat), the invoicing of currencies is not included, as confirmed in an official communication. The Croatian National Bank also provides data on trade in services, but omits the currency composition. The only available data comes from Eurostat, which covers trade in goods with non-EU countries, as shown in Figure 1.

By 2023, the share of the euro in exports rose from 75.5% to 82.3% and in imports from 58.6% to 69.5%. The US dollar's share of exports fell from 13.4% to 11.8%, while its share of imports rose slightly (from 26.6% to 26.8%). Other currencies saw a notable decline, from 14.8% of imports and 11.1% of exports in 2022 to 3.7% and 5.9% respectively in 2023.

**Figure 1:** The share of euros, dollars and other currencies in Croatian exports of goods (left panel) and imports of goods (right panel) with non-EU countries



Source: Author, Eurostat (2024)

These shifts are significant in two ways. First, the share of the domestic currency in imports and exports was very low before joining EMU, as shown by the low shares of other currencies in 2022, including the Croatian kuna. Secondly, the share of the domestic currency has surged in 2023, as the euro is now a domestic currency, which means that the share of other currencies has decreased. The exchange rate changes now affect a significantly lower share of foreign exchange in goods, which means a weaker effect on Croatian exports and domestic prices.

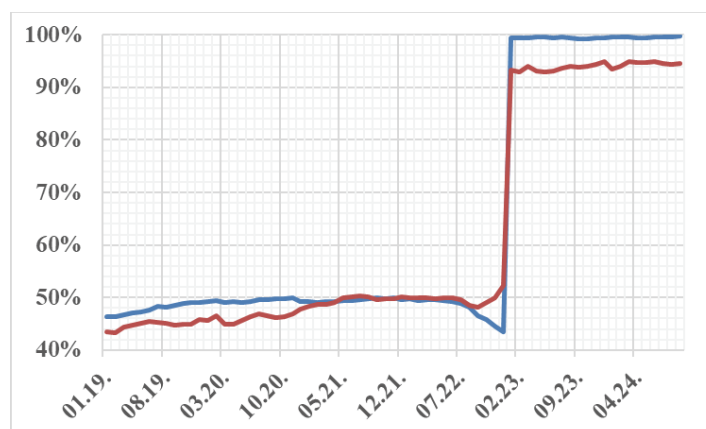
After joining EMU, the nominal effective exchange rate is now closely related to the euro/dollar exchange rate, as the US dollar accounts for the largest share of Croatian goods imports (around a quarter). The share of the US dollar and other currencies in Croatian goods imports is around 30%, i.e. exchange rate changes now affect this percentage of imports. This is far less than before joining EMU, when almost 90% of imports were paid for in foreign currency. The pass-through of the nominal effective exchange rate can therefore be severely dampened.

Furthermore, the depreciation of the euro no longer affects the price competitiveness of Croatian exports to the eurozone. After joining the eurozone, the change in the nominal effective exchange rate therefore affects the price competitiveness of a much smaller proportion of exports. This change is likely to reduce the elasticity of exports to exchange rate fluctuations and weaken the link between exchange rates and exports. For non-EMU countries, the depreciation of the euro still increases their purchasing power, as they need less of their currency to buy the same amount of goods<sup>4</sup>.

Not only have the trade channel and the exchange rate pass-through been weakened, but balance sheets effects channel is now also greatly altered. Before joining the eurozone, Croatia had a high degree of euroization. A large proportion of deposits and loans were denominated in foreign currency, primarily in euros. The introduction of the euro has transformed Croatia from a highly dollarized economy to one in which foreign currency risk on deposits and liabilities has been virtually eliminated. As shown in Figure 2, after joining the eurozone, over 95% of domestic deposits and almost all liabilities are denominated in euros.

<sup>4</sup> This effect varies depending on the degree of pricing-to-market and exchange rate pass-through.

**Figure 2:** Share of domestic currency in deposits and liabilities of other domestic sectors at other monetary financial institutions



Source: Author, Croatian National Bank (CNB). **Note:** Blue (red) line represents the share of domestic currency in liabilities (deposits); foreign currency liabilities include kuna loans with a currency clause and loans in foreign currencies. Before (after) Croatia's entry into the eurozone, other domestic sectors include local government, non-financial corporations, and households (general government and other resident sectors).

This shift from a relatively high to a very low (close to zero) share of foreign currencies in the deposits and liabilities of domestic non-financial sectors has significantly dampened balance sheet effects. After joining the eurozone, exchange rate fluctuations have a much weaker impact on corporate investment and sales as well as on household disposable income, debt and the net wealth of private households.

Before joining the eurozone, Croatia's high degree of euroization meant that currency depreciation had noticeable consequences. It increased the burden of foreign currency loans and loans with currency clauses and had a negative impact on companies that were dependent on such financing. As net savers in foreign currency, households experienced an increase in assets as a result of the depreciation. However, this advantage was (partly) offset by higher loan repayment charges and price increases due to the weakening of the currency, which led to redistribution effects.

The depreciation also had an impact on real estate prices, as these were often denominated in Deutschmarks and later in euros, although the official currency was the kuna. In addition, the burden of repaying government debt increased following depreciation, which increased risk premium and consequently interest rates.

With the introduction of the euro, these transmission channels, especially the balance sheet effects, are no longer active. These mechanisms were key to the negative effects of currency depreciation on output. Their absence implies that exchange rate changes might have weaker impact on the balance sheets of economic sectors and consequently on overall economic activity<sup>5</sup>. Since the balance sheet effects are now virtually zero and the foreign

<sup>5</sup> Of course, some of the liabilities of the state and companies do not relate exclusively to claims of other financial institutions, but also to claims of other domestic and foreign agents. However, this should not change the conclusion about the weakening of the channels linked to the balance sheets.

trade channel and the exchange rate pass-through have weakened after joining the eurozone, the relationship between the exchange rate, exports and output may also have been weakened.

### **3.2. Unit Labour Cost, Exchange Rate and Competitiveness After Joining the Eurozone**

The introduction of the euro has significantly changed the relationship between the exchange rate and economic activity in Croatia, including the link to ULC. For example, depreciation now has a weaker impact on exports, balance sheets and output, which in turn reduces its impact on ULC. Although the depreciation continues to increase the cost of imported inputs, this effect is now limited to goods that are not invoiced in euros. Similarly, its impact on real wages has decreased; the depreciation increases the prices of some imported goods, but this proportion is now lower than before joining the eurozone. This points to weaker impact of the depreciation on ULC.

On the other hand, the influence of the Croatian ULC on the euro exchange rate is essentially non-existent. As a small economy within the eurozone, the fluctuations of the Croatian ULC have practically no or very little impact on the euro exchange rate due to its small share in the overall eurozone economy. It is unlikely that the ECB will react to changes in the Croatian ULC. While some correlation between the ULC and the exchange rate may remain due to the synchronization of business cycles, the direct causal relationship is effectively zero.

Croatia's simultaneous accession to the Schengen area and EMU on January 1, 2023 has further reduced trade barriers, increased price transparency and lowered transaction costs. These changes could increase the sensitivity of exports to relative prices and costs. In addition, the complexity of Croatian exports (Observatory of Economic Complexity, 2024) and the quality of manufacturing exports (Eurostat, 2024) have improved only to a limited extent in recent years which is not sufficient to reduce cost sensitivity of exports.

Research supports this view. Alhola and Keranen (2022) show that exports within the eurozone are generally more sensitive to costs than exports outside the monetary union. Similarly, Turunen, Bayoumi and Harmsen (2011) show that trade within the eurozone is more sensitive to relative price changes than trade with countries outside the eurozone. These results suggest that the introduction of the euro in Croatia might have increased the impact of price and cost competitiveness on export dynamics.

## **4. DISCUSSION AND RECOMMENDATIONS FOR FUTURE RESEARCH**

Even before the introduction of the euro, Croatia's ability to adjust relative costs via exchange rate fluctuations was limited due to the fixed nature of its exchange rate system. Consequently, the transition to the eurozone has not fundamentally changed the country's economic adjustment mechanisms. However, by completely abolishing exchange rate flexibility, the introduction of the euro has reinforced the need to keep costs stable, as any increase now directly undermines competitiveness. This underlines the crucial importance

of price stability and cost control. The loss of monetary policy independence has somewhat increased Croatia's dependence on the alignment of wage growth with productivity. A persistent mismatch between wages and productivity could undermine price stability, especially if no exchange rate adjustments are made.

The introduction of the euro has also brought profound structural changes in the Croatian economy and significantly altered monetary transmission mechanisms. For example, inflation expectations, which were previously anchored in the kuna-euro exchange rate, are now influenced by other factors. Although this shift warrants further investigation, it is beyond the scope of this paper.

Croatia's continued dependence on cost competitiveness and the lack of a strategic shift towards high-technology exports, which are generally less cost-sensitive, gives increased importance to price stability, controlling production costs and improving product quality. With increasing integration into eurozone markets, rising wages or input costs could have a more significant impact on export performance. Policy makers and businesses must therefore prioritize efficiency gains, productivity improvements, investment in workforce skills and innovation to reduce over-reliance on cost competitiveness and ensure sustainable long-term growth.

As a relatively high proportion of domestic price and GDP fluctuations are due to foreign shocks (Kunovac & Krznar, 2010; Jovičić & Kunovac, 2017), domestic policy measures can only be of limited effectiveness in countering these external factors. This underlines the need for robust economic policies to mitigate these risks. In the face of sudden and severe energy price shocks, for example, fiscal policy should act as a stabilizing force. Measures such as introducing price caps for food and energy and limiting profit margins while supporting economic growth and containing public debt to GDP have proven to be reasonably effective in Croatia in recent years.

Reducing the vulnerability of domestic prices and production to foreign shocks remains an important goal. To achieve this, energy independence must be increased, the transition to renewable energy sources completed and energy prices stabilized. These initiatives should be driven forward at EU level to maximize their impact. In addition, improving flexibility and of the labor market can play an important role. A more responsive labor market allows economies to absorb external shocks more effectively, supporting economic stability and resilience.

Finally, a diversification of Croatia's export base, particularly through a strategic shift towards high-technology exports, could reduce the economy's vulnerability to cost changes and provide a buffer against global price fluctuations. Such a shift would strengthen the structural foundations of the economy and improve long-term competitiveness.

From the preceding discussion, it is clear that price and cost competitiveness are linked to economic activity and macro-financial stability through numerous intertwined and bidirectional links. Before joining EMU, research focused mainly on the exchange rate, the effect of which may now be weakened. However, as Croatia continues to import significant amounts of energy, especially oil, most of which is paid for in US dollars, the depreciation of the euro/dollar exchange rate continues to have a noticeable impact on domestic prices and thus on economic activity. Future studies should assess the response of domestic economic activity to changes in nominal effective and the euro/dollar exchange rate after joining the eurozone in order to quantify the strength of this relationship.

On the other hand, Croatia's entry into the eurozone may have increased the relative importance of the cost competitiveness. Unfortunately, there is a gap in the literature here. For example, it is known that ULC plays an important role in shaping export prices and the overall domestic price level. Slower growth in domestic ULC compared to foreign ULC could have a positive impact on the country's price competitiveness and thus positively influence exports. The extent to which ULC feeds through to product prices is crucial in this process.

The pass-through of costs to prices in Croatia has so far been insufficiently researched, which is surprising given the importance of this phenomenon for prices and economic activity. The author is aware of one study that has examined the pass-through effect of ULC on domestic prices. De Luigi, Huber & Schreiner (2019) find that this effect has declined and become insignificant in the period after the 2008/2009 financial crisis, a result that has also been confirmed in other new EU Member States.

Despite the numerous channels linking ULC and cost competitiveness to economic activity, these issues have only been the subject of a few studies in the domestic literature. Most of the studies were conducted at sectoral or aggregate level and focused on exports and manufacturing, confirming the importance of cost competitiveness as a significant predictor of manufacturing production and exports.

Only a smaller number of studies use microeconomic data, such as Škuflić & Novinc (2024), which show that ULC is a significant predictor of firm returns in all sectors of Croatian manufacturing and that there are important heterogeneities between firms that shape the relationship between ULC and firm output in Croatian manufacturing. Novinc (2024) shows that ULC is strongly associated with exports of manufacturing firms in Croatia and that there are important non-linearities and heterogeneities shaping this connection.

Energy prices were examined mostly with aggregate data (e.g., Borozan & Cipčić, 2022; Borozan, 2013; Keček, 2023; Szomolányi, Lukáčik, & Lukáčiková, 2024), while export prices appear to have been studied in only a few papers, such as Tomić & Bukovac (2018), while Nadoveza Jelić & Ravnik (2022) estimate export price functions as part of their work. Some insight about export prices can be gained from Pufnik & Kunovac (2012).

A better understanding of how export and energy prices are determined and what factors influence them can provide the basis for a deeper understanding of the impact of price and cost competitiveness on exports and economic activity. Examining the extent to which foreign price shocks feed through to domestic prices can provide valuable insights for policy makers. Understanding these dynamics can help in devising measures to combat inflation and stabilize the economy. Conducting sector-specific studies can reveal heterogeneous effects in different industries. Microeconomic data can also be helpful as it could provide a deeper understanding of these issues.

## 5. CONCLUSION

The analysis in this paper shows the significant shifts in the relationship between price and cost competitiveness and economic activity in a small open and highly euroized economy (Croatia), after joining the monetary union (eurozone). A key message of the paper

underlines the changing link between the exchange rate and economic activity: (1) the trade channel has become less effective, (2) the balance sheet effects, which were previously pronounced due to strong euroization, are now strongly dampened, and (3) the exchange rate pass-through, which is now primarily linked to the euro-dollar exchange rate, appears to be weaker. In addition, the relationship between unit labor costs (ULC) and the exchange rate has changed significantly.

The role of price and cost competitiveness might have increased following Croatia's simultaneous entry into the eurozone and the Schengen area. This has further reduced trade barriers, increased price transparency and lowered transaction costs. These changes could have increased the sensitivity of exports and economic activity to relative prices and costs. The structural changes associated with this double accession underline the importance of maintaining price stability and controlling production costs.

Without a shift towards high technology exports, which are less cost sensitive, Croatia faces an increased risk of export performance being affected by cost pressures. This environment requires a focus on increasing efficiency, improving productivity and investing in workforce skills, innovation and non-price competitiveness. These measures are essential to reduce dependence on cost competitiveness and ensure long-term economic growth.

As domestic prices and economic activity are highly dependent on foreign variables, domestic policy measures can only be effective to a limited extent in counteracting external cost shocks. It is therefore necessary to reduce the vulnerability of domestic prices and output to foreign shocks. To achieve this, efforts must be made to increase energy independence, switch to renewable energy sources and stabilize energy prices. Pursuing these initiatives at EU level can increase their impact and promote greater economic resilience.

The paper also addresses gaps in the literature and provides directions for future research to deepen the understanding of price and cost competitiveness in Croatia. While the exchange rate has been studied extensively, there has been less focus on export prices, labor costs (including ULC) and detailed sector-specific analysis. As relative costs and prices become increasingly important in shaping economic outcomes, research should prioritize these areas.

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