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Real estate boom and export performance bust in Croatia*

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Abstract

The goal of this research is to estimate the effect of resource reallocation from the manufacturing to the real estate economic sector on exporting activity in Croatia, a small open post-transition country that experienced a real estate boom during the previous decade. This paper follows the work by Égert and Kierzenkowski (2014) as we test the hypothesis that the real estate boom had an adverse impact on country's export performance. For that purpose we use quarterly data ranging from 1Q1998 to 3Q2013, and estimate export equations using maximum likelihood and dynamic ordinary least squares estimators of cointegration. Our results indicate that the distortion of relative prices in favor of non-tradable sectors (construction and real estate), which is a direct by-product of the real estate boom, has had stifling effects on export performance. Our results also suggest that ailing cost competitiveness and governments' inability to implement policies promoting private sector economic development adversely influenced export performance during the period analyzed. The basic conclusion of our research is that the expansion of a non-tradable sector in a country with limited supply of production factors can have a detrimental effect on the ability of the tradable sector to increase its output and compete in international markets.

Key words: *competitiveness, exports, manufacturing, real estate, resource allocation*

JEL classification: *C32, F10, F14, O14*

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1. Introduction

Croatia is a small open economy, negligible in global terms of international trade and exports. Its average export market share in total world exports in the period between 1999 and 2012 stood at only 0.13 percent. However, for a small economy that is highly indebted abroad, export activity is rather important in terms of debt repayments, import cover, and maintaining exchange rate stability. Regarding import cover, Croatia is a typical example of a post-transition economy with large international trade deficits, caused by a disproportional rise in imports of goods and services. Due to many different factors, Croatia's exports have successively been below imports, resulting in an average trade balance deficit of 6.1 percent of GDP in the period between 2000 and 2009. Tightly managed exchange rate of Croatian currency (kuna) vis-à-vis the euro is usually blamed for such poor export performance (Nikić, 2003), but having in mind that for example Slovakia managed to improve its goods trade account after it entered the euro zone, implies that this claim needs at least further argumentation. Moreover, available empirical studies building on the behavioral equilibrium exchange rate model and the PPP hypothesis suggest that the exchange rate of Croatian kuna was indeed aligned with the fundamentals in the period under examination (Belullo and Broz, 2009; Tkalec and Vizek, 2011). Even if the exchange rate regime bears a part of the export performance explanation, it certainly is not the only determinant.

Against this background, the aim of this paper is to explore the effect of resource reallocation from the manufacturing to the real estate economic sector on Croatian exporting activity that occurred during the real estate boom. We therefore investigate potential adverse effects of propulsive non-tradable sector activities on export performance. We estimate standard export equations using maximum likelihood and dynamic ordinary least squares estimators of cointegration, whereby we control for the usual export determinants, such as export demand, export prices, and unit labor costs. This approach was first formulated by Égert and Kierzenkowski (2014), who investigated the influence of real estate booms on export performance in developed countries. Their main finding is that the reallocation of factors of production from tradable to non-tradable sectors caused by the real estate boom has had an adverse effect on the export performance in developed countries. Hence, in this paper we test *the hypothesis that the reallocation of factors of production from tradable to non-tradable sectors prior to 2008 had an adverse effect on the export performance in Croatia.* A real estate boom, that has taken place in Croatia prior to 2008, had distorted the relative prices in favor of non-tradable sectors (construction and real estate) and production factors had been reallocated from tradable to non-tradable sectors of an economy, thereby stifling the supply of labor and capital to the export sectors. Due to inadequate supply of labor and capital, export companies or companies that would have liked to take part in international trade, could not have overcome size limitations and achieve economies of scale necessary for exporting.

The contribution of the paper to the literature is twofold. First, by exploring the export performance in Croatia during the period of the real estate price boom, we present empirical evidence suggesting that real estate booms may have had detrimental effects on exports not only in developed countries (as suggested by Égert and Kierzenkowski (2014)), but also in post-transition countries. As available empirical studies maintain that real estate booms are on average more pronounced in post-transition European countries, when compared to the European core (Posedel and Vizek, 2011), we feel that it is important to examine the relation between export performance and real estate sector developments in the former group of countries. Second, although Croatian export has been clearly underperforming in the last 15 years, there are only several studies exploring the features of Croatian export (Vukšić, 2005; Buturac, 2009; Stojčić, 2012a; Stojčić et al., 2012). To the best of our knowledge, none of the studies focuses specifically on resource reallocation as a reason for Croatian exports sluggish performance.

The rest of the paper is organized as follows. The second section presents relevant literature, followed by the empirical model and methodology issues. The fourth section discusses empirical data concerning main characteristics of Croatia's poor export performance providing arguments in favor of the resource reallocation hypothesis, while section five presents empirical results. The last section concludes the paper.

2. Literature review

There could be numerous explanations for observed weak export performance in Croatia. Standard export models outlined in Goldstein and Khan (1985) would suggest either that the price competitiveness of Croatian exports has gradually deteriorated, or that the demand for Croatian exports has been reduced due to ailing income prospects of Croatian biggest export markets. Although economic conditions in Italy, Bosnia and Herzegovina, and Slovenia (the first, the second, and the fourth biggest Croatian export market) are far from satisfactory, and although price competitiveness of Croatian exports has indeed shown signs of erosion, we feel that another possible explanation should also be taken into account. In line with the export model for developed countries outlined by Égert and Kierzenkowski (2014), we claim that inter-sectoral reallocation of resources from tradable to non-tradable sectors, spurred by the real estate boom, took place in post-transition countries as well. In particular, we claim that this inter-sectoral reallocation of production resources had an adverse effect on export performance in Croatia.

In order to understand Croatian export performance, it has to be perceived within the larger European context. Stöllinger et al. (2013) point out that the evolving structure of tradable sectors in European transition economies resulted in export

agglomeration tendencies within the EU. More specifically, Central and Eastern European countries (Czech Republic, Slovakia, Hungary, Poland and Slovenia) together with Germany and Austria form a "Central European manufacturing core" (Stöllinger et al., 2013: 21). This agglomeration is a by-product of more granular international specialization sparked by fragmentation of production, international production sharing and offshoring between Germany and Austria on one side, and Central European countries on the other. As a result, Central European manufacturing core exports share in total extra-EU value added exports rose by more than 7 percentage points, from 37 to more than 44 percent. Not surprisingly, even early on in the transition process it was evident that foreign direct investment has played a crucial role for export performance in these Central and Eastern European countries (Hoekman and Djankov, 2000). Even in Poland, whose penetration by FDI is somewhat shallower, foreign-owned firms accounted for 68% of total export revenues (Podkaminer, 2013). As a result of these agglomeration tendencies, trade integration between the largest Central and Eastern European countries and the euro area is already relatively well advanced (Bussière et al., 2005). Meanwhile, the Baltic countries as well as the South Eastern European countries (including Croatia) still have significant scope to strengthen their trade links with the euro area.

Due to limited penetration of FDI (and in particular greenfield FDI) in Croatia, it is not surprising that Croatian literature suggests that there exists a potential for improving the export performance of Croatian manufacturing industry by attracting more FDI into this sector (Vukšić, 2005). Further on, Buturac (2009) suggests that Croatian manufacturing suffers from an insufficient level of trade specialization and comparative advantages. Moreover, he claims that the products with comparative advantage do not have the highest ratio of the unit value of exports and the unit value of imports, implying that Croatian manufacturing has a suboptimal trade structure. Stojčić (2012a) claims that Croatian exporters rely on labor costs and improvements in labor productivity. He also emphasizes there is a significant and positive relationship between exports and firms' location in small urban areas or free trade zones. His results are corroborated by a different study (Stojčić et al., 2012) that finds that the most important determinant of Croatian exports is the cost part of price competitiveness – unit labor costs.

Besides these factors, existing literature also recognizes that Croatia integrated into international trade flows much slower than other Central and East European countries. For example, it became a member of the World Trade Organization as late as 2000 while the Association Agreement with the European Union that gives preferential acess to the EU market was signed in 2001. While other European transition economies already enjoyed this preferential acess, Croatia has been left out also in the sense that exporters from transition economies that had an Association Agreement with the EU were discouraged to source their inputs in Croatia, as these agreements required that their exports to the EU market must contain a minimum

level of inputs originating either in the EU or in Association Agreement countries. Not only that Croatia was not a part of the EU market, it was neither a member of the Central European Free Trade Agreement (CEFTA) until 2003 that impeded its access to markets of other CEECs (Bartlett, 2003; Stojčić, 2012b).

3. Empirical model and methodology issues

3.1. Empirical model

Our empirical model largely relies on Égert and Kierzenkowski (2014). We therefore, in order to assess the relative importance of various factors affecting export performance in Croatia, estimate a reduced-form export equation. Typically, the determinants of exports (EXP) are the export market or a proxy for export demand (ED) and a measure of price competitiveness (PC). The standard export equation therefore has the following form:

$$EXP_t = \alpha_0 + \alpha_1 ED_t + \alpha_2 PC_t + \varepsilon_t \quad (1)$$

where $\alpha_1 > 0$ and $\alpha_2 < 0$.

The export demand variable measures the demand for Croatia's output. As price competitiveness is not a very precise and reliable way to explain export performance (as explained in section 2), we follow the literature and instead include a cost competitiveness measure, unit labour costs. When we replace the price competitiveness variable with the cost competitiveness (CC) measure, we arrive at the following model specification:

$$EXP_t = \alpha_0 + \alpha_1 ED_t + \alpha_2 CC_t + \varepsilon_t \quad (2)$$

where $\alpha_1 > 0$ and $\alpha_2 < 0$.

Transition economies in particular have shown great export reliance on governance. It seems that the government ability to implement certain economic policy, a set of laws, and regulations that promote private sector economic development can have a detrimental effect on exporting activity. Filatotchev et al. (2007) for example show that governance in large Polish and Hungarian companies had a significant influence on export decisions and overall performance. We therefore added an indicator of governance (GOV) to our baseline export model:

$$EXP_t = \alpha_0 + \alpha_1 ED_t + \alpha_2 CC_t + \alpha_3 GOV_t + \varepsilon_t \quad (3)$$

where α_1 and $\alpha_3 > 0$, and $\alpha_2 < 0$.

Equations (2) and (3) present standard export models, and we will use these two model specifications in this study as our baseline models. We augment these models by a measure that captures resource reallocation from the manufacturing to the construction sector. This new variable is defined as a ratio of house prices and producer prices in the manufacturing sector (REAL). As a reminder, Figure (5) shows that this ratio was slowly decreasing until 2001, and then it started to rise until a peak in 2007. The rise in REAL stems from a more intensive increase of real estate prices, when compared to manufacturing prices. After 2008, when house prices started to decrease, REAL also decreased while producer prices continued to increase. The movement of REAL implies there could have been resource reallocations of capital and labour from manufacturing to construction. This augmented export model has the following specification:

$$EXP_t = \alpha_0 + \alpha_1 ED_t + \alpha_2 CC_t + \alpha_3 GOV_t + \alpha_4 REAL_t + \varepsilon_t \quad (4)$$

where α_1 and $\alpha_3 > 0$, and α_2 and $\alpha_4 < 0$.

3.2. Econometric estimation

Following Égert and Kierzenkowski (2014), after examining the stationarity of time series using the augmented Dickey Fuller test (ADF), we have determined that all series are integrated of order one. In order to account for the nonstationarity in the data, we decided to run cointegration econometric analysis. For the sake of robustness, we use different cointegration methods; the residual-based test based on residuals from dynamic ordinary least squares, and Johansen cointegration.

The dynamic ordinary least squares (DOLS) estimator introduced by Saikkonen (1992) and Stock and Watson (1993) is used in order to obtain long-term α_i coefficients. DOLS is a preferred estimator because it accounts for endogeneity of regressors and serial correlation of residuals as it includes leads and lags of regressors in first differences. DOLS has the following specification:

$$EXP_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 X_{i,t} + \sum_{i=1}^{n} \sum_{j=-k_1}^{k_2} \beta_{i,j} \Delta X_{i,t-1} + \varepsilon_t$$

where $X_{i,t}$ are regressors, n the number of regressors, and k_1 and k_2 denote leads and lags. As a cointegration test, the residuals of DOLS estimation are tested for stationarity using critical values that are calculated from MacKinnon (1991) using the following formula:

$$C_k(p,T) = \beta_\infty + \beta_1 T^{-1} + \beta_2 T^{-2}$$

where p and T are the significance level and the sample size, while betas are parameters of response surface estimates (MacKinnon, 1991).

We also carry out Johansen's vector autoregression (VAR)-based cointegration and vector error-correction model (VECM) estimation that takes the following form:

$$Y_t = (m_0 + m_1 t + (1 + \alpha\beta')Y_{t-1}) - \sum_{i=1}^{p-1} \Phi_i \Delta Y_{t-1} + \varepsilon_t$$

where Y represents the vector including exports and the set of its determinants. The VAR-based Johansen cointegration test is performed using trace statistic and critical values obtained by Osterwald-Lenum (1992).

4. Empirical data and analysis

4.1. Empirical data

In order to estimate an export equation and assess the influence of inter-sectoral reallocation of production resources on export performance in Croatia, we use quarterly time series data covering the period from 1Q1998 to 3Q2013. We use the data for total exports of goods and services in constant prices collected from national accounts as a dependent variable EXP_t. The variable representing export demand (ED_t) is derived as a weighted average of the GDP of Croatian main export markets: Italy, Austria, Germany, Slovenia, the UK, Russia, Serbia, and the US.[3] The weights are determined according to the share of merchandize exports of respective countries in the total merchandise trade. We constructed another proxy for foreign demand for Croatian exports that we use as a robustness check. In this proxy we use the weighted average of GDP of EU27 member states, the US, and Russia.

The governance indicator (GOV_t) is obtained from the World Bank, and it is available in yearly frequency as of 1998. The indicator captures government ability to implement policies and regulations that promote private sector economic development. Due to the fact that all other variables are available in quarterly frequency, we have used identical values of the governance indicator for all quarters in a year.

[3] We note that even though Bosnia and Herzegovina is the second largest Croatian export market, due to the lack of data we could not include its GDP in the construction of the proxy for the demand for Croatian exports.

As a measure of Croatian export prices (PC_t), we use the deflator of export of goods and services from the national accounts. In line with Égert and Kierzenkowski (2014), we also calculate the variable representing relative prices of the non-tradable vis-à-vis the tradable sector ($REAL_t$). This is done by dividing house prices by producer prices in the manufacturing sector. In this manner we construct a proxy for price changes in the non-tradable (construction and real estate sector) relative to the tradable sector, which represents the observed inter-sectoral reallocation of production factors.

Finally, we also use two proxies for unit labor costs (CC_t), one for the entire economy, and the other for the manufacturing sector, in order to capture the deterioration in the price competitiveness of Croatian exports.

All variables are transformed into indices with 1998 as a base year. Then they are transformed into logarithms, deflated where needed, and seasonally adjusted. The source for the export of goods and services series, export deflator, unit labor costs, and producer prices in manufacturing sector is the Croatian Bureau of Statistics. The source for the house price series is the Croatian National Bank. GDP of main Croatian export markets is collected from Eurostat and International Financial Statistics.

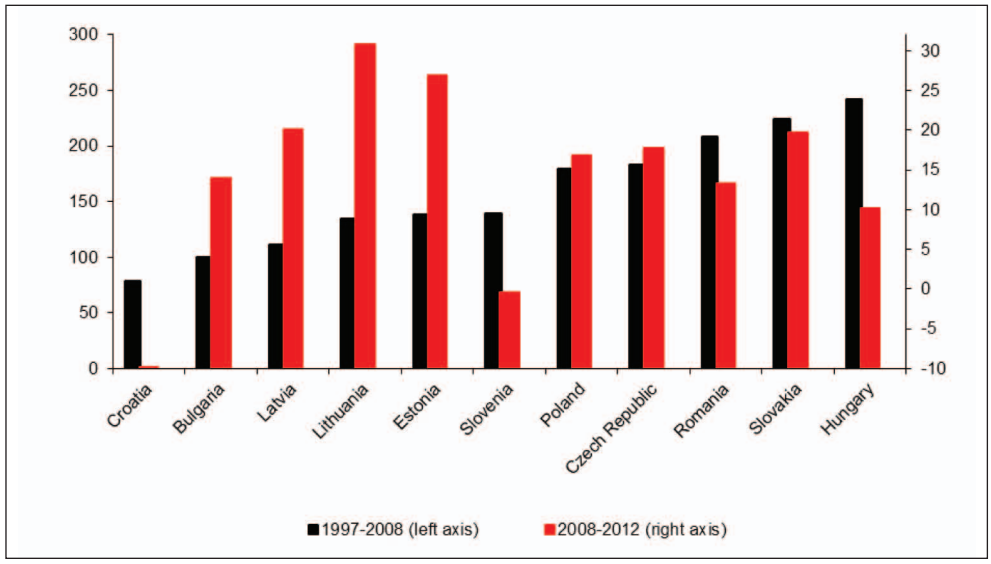
4.2. Descriptive analysis

Before turning to the discussion of the empirical results, we provide some stylized facts and descriptive statistics that shed light on the determinants of sluggish Croatian export performance.

When dividing the last 15 years of export performance into two sub periods, one encompassing the rapid expansion of international trade from 1997 to 2008, and the other entailing the trade crunch experienced in 2009, and the subsequent recovery, it becomes obvious that Croatia is by far the worst export performer among post-transition EU member states (Figure 1). Croatia had enjoyed the lowest cumulative growth of exports of goods and services in the boom years, and is also the only country in the region in which exports still have not recovered to pre-crisis levels (exports are still down by 10 percent from the level recorded in 2008). When it comes to exports, in the 1997-2008 period the best performers were Hungary, Slovakia, Romania, the Czech Republic, and Poland. These countries (with the exception of Romania) were also the countries that in the pre-crisis period recorded either a small trade surplus or a small deficit. Other countries in the region, including Croatia, as a rule recorded higher current account imbalances.

Figure 1: Cumulative change of export of goods and services

– in percent



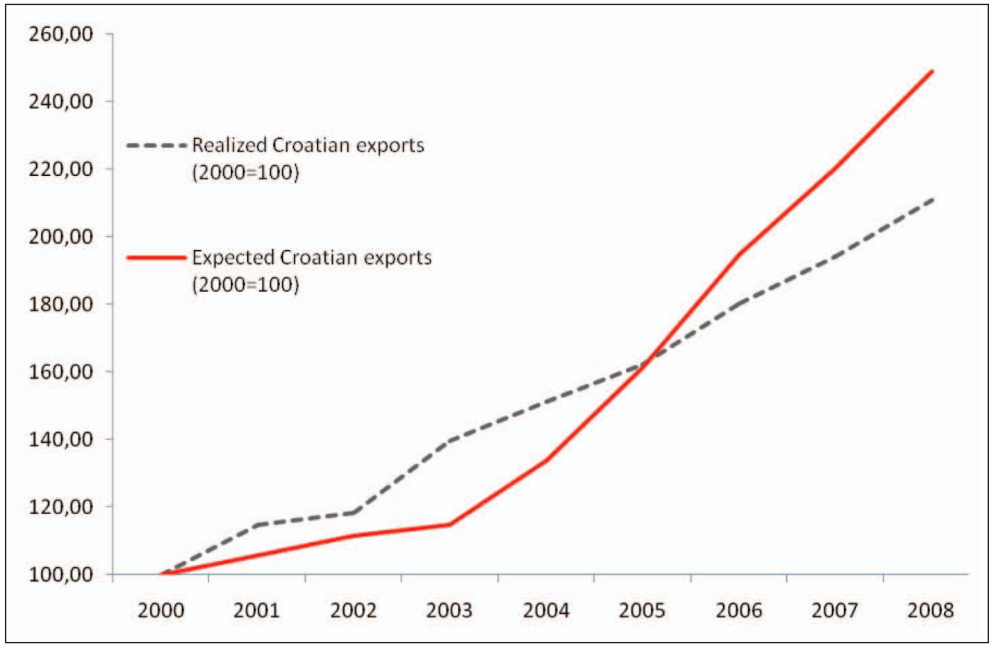
Source: Eurostat

Poor performance of Croatian exports is even more pronounced when we consider the changes of export market shares. Croatia had the second lowest rate of export market share growth rate in the 2000-2008 period, among examined countries (see Appendix, Figure 1). The average rate for Croatia was only 3.2 percent, well below the group average that was at 5.8 percent at the time. Although Croatia's export market share was growing, this is no exception because all post-transition economies recorded growing export market shares as they liberalized their current accounts as of the beginning of 90's. What is worrisome is that Croatia had a very low export market share growth rate and an export share (around 0.13 percent) comparable only to countries much smaller in size. Moreover, it seems there are not many differences in geographical orientation of the countries explored. All these countries are close to and oriented towards core EU countries, they are mostly small countries, and they have similar industry specialization. Existing literature does not give much insight into the reasons for such export performance differences between countries in the region. Only Stojčić et al. (2012) argue that in the past decade Slovenian industry improved in terms of quality, while Croatian industry still largely depended on unit labor costs, thus limiting its growth potential.

Figure 2 presents a scenario in which Croatian export market share grew by the same rate as was the average rate of the region in the period between 2000 and 2008, i.e. by 5.8 instead of 3.2 percent. Although Croatian exports were performing well up to 2005, after that year we can observe certain export underperformance when compared

to other EU transition economies. If Croatian exports had been following the average regional dynamics, by 2008, its exports would have been around 30 percent above those actually realized. This implies the Croatian economy was not able to answer growing foreign demand for emerging Europe products and services.

Figure 2: Realized and expected Croatian exports in the 2000-2008 period[4]



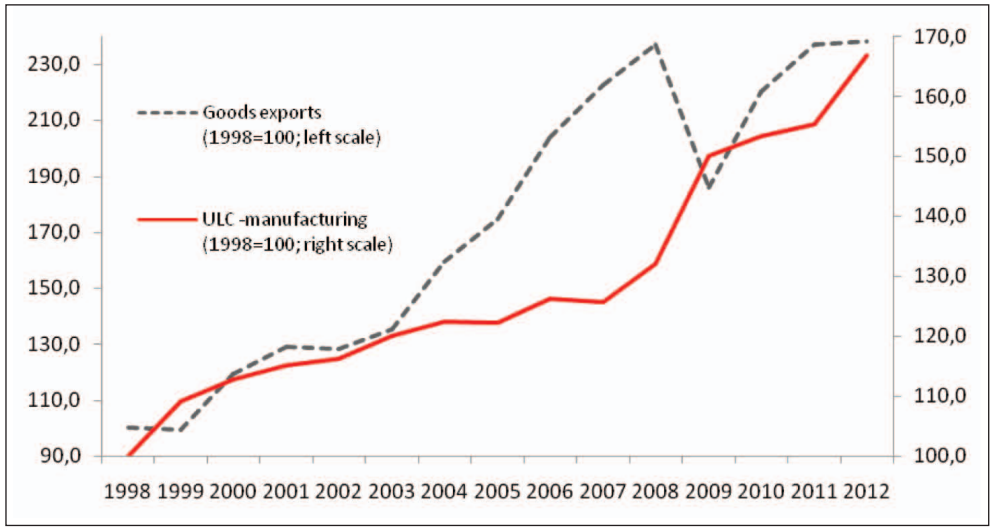
Source: Eurostat

One of the reasons for sluggish export performance undoubtedly lies in eroding price competitiveness, as measured by export prices (see Appendix, Figure 2). Although exports increased together with export prices, eroding price competitiveness explains at least a part of poor export performance. In the 2000-2009 period, Croatian export prices rose by 28.9 percent, the fastest growth rate observed in the region. This resulted in deterioration of terms of trade, which, according to Croatia Bureau of Statistics data, increased by 13 percent from 2000 to 2012. In comparison, according to data provided by the Vienna Institute for International Economic Studies, the average of terms of trade for other new member states of EU (excluding Malta and Cyprus) improved by 1.5 percent over the observed period.

[4] If the average annual exports growth rate was equal to the average rate of the region, or 5.8 percent, instead of 3.2 percent, or the realized average rate for Croatia.

Figure 3: Total exports and cost competitiveness measured by unit labor costs (ULC) in manufacturing

– 1998=100



Source: Croatian Bureau of Statistics

Figure 3 shows that unit labor costs in manufacturing rose together with exports, resulting in a deterioration of price competitiveness. In the period between 2000 and 2009 unit labor costs in manufacturing increased by 33 percent, as opposed to unit labor costs in total Croatian industry that rose by a more moderate rate, 21.6 percent.

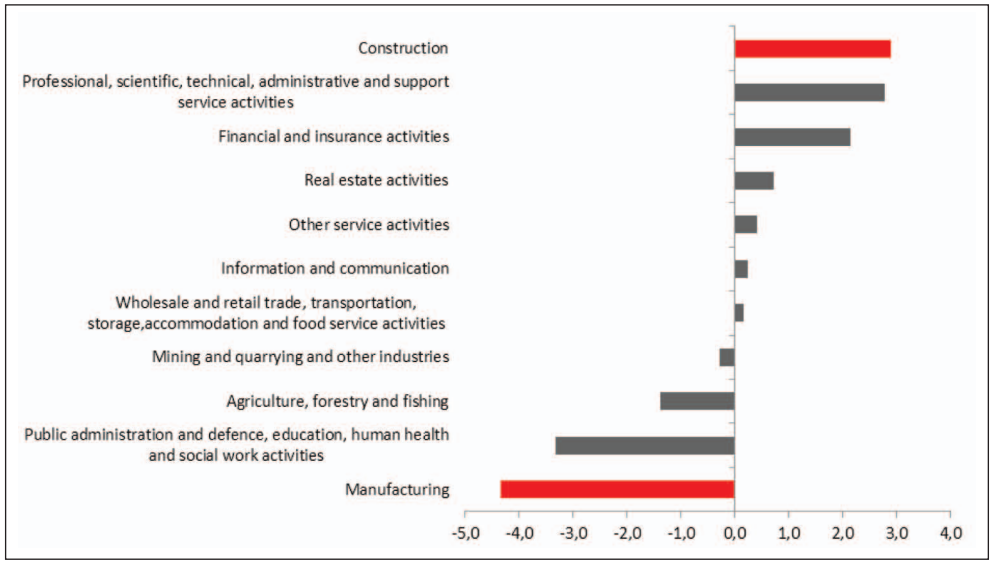
Sluggish export growth resulted in a deteriorated external balance of the Croatian economy. In the period between 2000 and 2009, Croatia's trade balance in goods and services had been on average in a deficit amounting to -6.1 percent of GDP (see Appendix, Figure 3). When compared to other EU post-transition economies, Croatia is in a group of countries with high trade imbalances, together with Bulgaria, Latvia, Lithuania, and Romania. Slovenia, Hungary, and Czech Republic are on the other side with either very low deficits or even surpluses, as in the case of Czech Republic.

Figure 4 provides a deeper insight into the structure of Croatian economic sectors and their gross value added. From the figure it is evident that manufacturing recorded the highest loss in total gross value added of the Croatian economy in the period from 2000 to 2009. From 19.9 percent in 2000, the share of gross value added, decreased to 15.5 percent, partially owing to already recognized drivers such as rising unit labor costs and deteriorating price competitiveness. However, some economic sectors recorded rising gross value added shares, especially construction. In the period examined, construction gained 2.9 percentage points and increased

its gross value added share from 5.0 percent in 2000 to 7.9 percent in 2009. This was the fastest and highest growth recorded among all Croatian sectors. While manufacturing lost the greatest part of Croatian gross value added, construction gained the most. We claim that resources were shifted from manufacturing to construction and other real estate related activities, driven by rising house prices and investment opportunities in the construction sector. Considering the fact that manufacturing is traditionally the base for merchandise export, this loss in gross value added could be connected to underperforming exporting activity.

Figure 4: Change in the share of gross value added by activity in the period from 2000 to 2009

– in percent



Source: Croatian Bureau of Statistics

As additional motivation for our hypothesis, we also present economic sector activity with respect to the labour market. Figure 4 of the Appendix confirms that the manufacturing sector suffered with the biggest outflow of workers, and that the construction sector profited from the biggest inflow in the period examined. While manufacturing lost 4.5 percent or 16,731 employees, construction attracted 39,513 employees, and increased the share in total employment by 2.5 percentage points. Both data from the gross value added and from the labour market therefore point to a possible reallocation from manufacturing to construction.

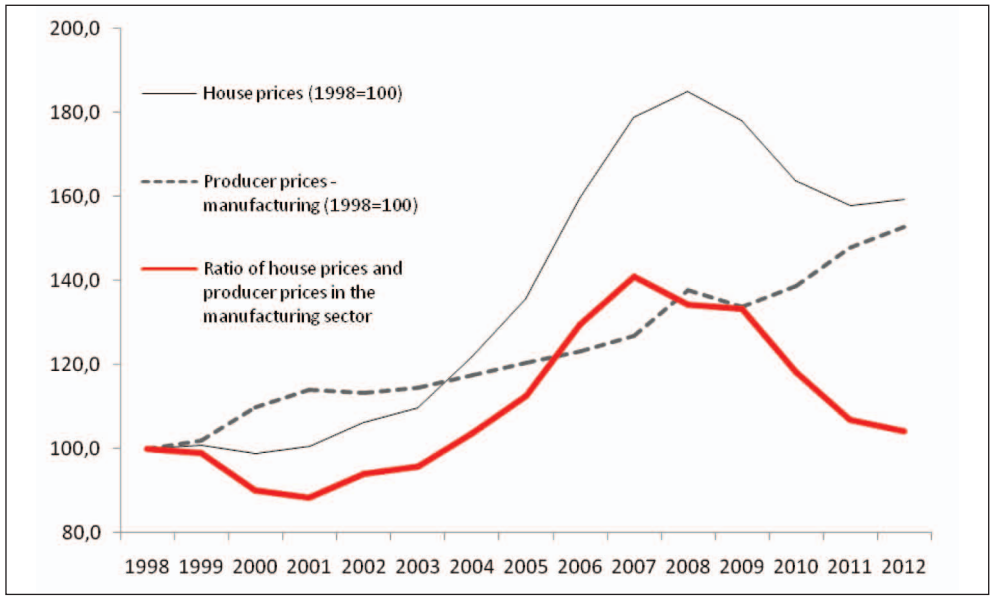
The statistical data presented above clearly indicate that during the pre-crisis period, the activity in manufacturing sector significantly declined, while the activity of the

construction sector and real estate related services disproportionally increased. This inter-sectoral reallocation of resources in favor of construction, and to the detriment of the tradable sector and Croatian export performance was caused primarily by the real estate boom, but may have also been influenced by intensive public investments in highways.

The real estate boom and its influence on the distortion of relative prices is displayed in Figure 5, which depicts the evolution of house prices, the producer prices of manufacturing goods and their relative prices (a ratio). In the 1998-2008 period house prices appreciated by 85 percent in nominal terms, while at the same time, producer prices of manufactured goods increased only by 38 percent, thus signaling entrepreneurs that real-estate-related activities offer much better prospects for realizing profits when compared to manufacturing. Due to the disproportionate growth of house prices, the ratio of house prices relative to producer prices grew in favor of house prices, causing inter-sectoral reallocation of resources and feeble capabilities of tradable sector to satisfy rising world demand for exports. Following Égert and Kierzenkowski (2014), we will use the ratio of house prices to producer prices in our empirical analysis as a proxy for reallocation of resources, which we feel might have contributed to inadequate response of Croatian export sectors to growing world demand for export products during the pre-crisis period.

Figure 5: House prices and producer prices in the manufacturing sector

– 1998=100



Sources: Croatian Bureau of Statistics and Croatian National Bank

Additional reason for reallocation of production factors to construction related activities can be found in intensive public investment in highways, which amounted to an estimated 13 percent of GDP during 2001-2011 period (Grubišić Šeba, 2013). As a total of 1,024 kilometers of highways was constructed during this relatively short time period, domestic demand for construction services grew dramatically. This demand was satisfied partially by the domestic construction sector which began to agglomerate production factors from other sectors, and partially by contracting foreign construction enterprises.

As a result of a combined effect of real estate boom and intensive public investments in highways, the number of active enterprises and crafts in construction sector rose from 15,486 in 2001 to 24,824 in 2008, while simultaneously the volume of construction works between 2000 and 2008 increased by 76 percent.

4.3. Empirical analysis

In the empirical examination we estimate three different models, as presented by equations (2), (3), and (4). The narrowest model includes only the standard export demand and cost competitiveness (Model 1), the broader model adds the governance indicator (Model 2), while the broadest model examines the effect of real estate prices on the reallocation of resources from one economic sector to the other (Model 3). First we estimate the model for the period from 1998 to 2009 because this was the time when real estate prices skyrocketed, and exports underperformed when compared to other countries in the region. We chose to end our sample with 2009, because the activity in the construction and real-estate sector is a bit lagging when compared to the general business cycle, and it continued well into 2009 (as corroborated by Figure 4), despite exports started to deteriorate already in the last quarter of 2008.

Table 1 shows that both cointegration tests indicate a long-run cointegration relationship for the baseline models (Models 1 and 2) and for the broadest model (Model 3). The residual-based test using residuals obtained from DOLS rejects the null of a unit root in all three models, and the trace statistic rejects the null of no cointegration against the alternative of one cointegrating vector, but does not reject the null of one cointegrating vector against the alternative of two cointegrating vectors in the Johansen cointegration case. Moreover, the error-correction terms in all model specifications are negative and statistically significant.

Table 1: Estimation results 1998 – 2009

Model	Model 1		Model 2		Model 3	
Cointegration tests						
Residual based test						
Test statistic	-3.994**		-6.325***		-5.613***	
Error-correction term	-0.052*		-0.126**		-0.691***	
Johansen cointegration						
Model selected using AIC	1		1		2	
H0: none CE	41.07***		60.16***		68.52**	
H0: at most one CE	24.60		41.07		47.21	
H0: at most two CEs	12.97		24.60		29.68	
Long-run coefficients estimates						
Variables	DOLS	VECM	DOLS	VECM	DOLS	VECM
Export demand	2.612***	3.062***	1.969***	2.252***	2.426***	2.460***
Unit labor costs	-0.714**	-2.109***	-0.587***	-1.194***	-0.477***	-0.885***
Governance			0.076**	0.077**	0.060***	0.078***
Relative prices					-0.212***	-0.160**
Constant	-1.746***	0.272	-0.708***	-0.014	-1.449***	-0.790
R-squared adjusted	0.947	0.036	0.981	0.079	0.986	0.373
Number of observations	46	47	45	47	45	44

Notes: *,** and *** denote statistical significance at the 10%, 5% and 1% levels. 1= the level data have no deterministic trends, but there is a constant in the cointegrating vector, 2= the level data have a linear trend and there is a constant in the cointegrating vector. CE stands for cointegrating equation. The Akaike information criterion (AIC) is used to determine the optimal length of lags and leads for DOLS and lags for the VAR model. The maximum lag length is set to equal 4.

Source: Authors' calculations

When we estimate these same three models, but on the whole sample, we get comparable results (Table 2). There is a long-run relationship between the examined variables, all variables are statistically significant, have the expected signs, and the parameters are very close to the ones obtained for the 1998-2009 period. Our results are therefore robust across different model specifications. Important to note is that the parameter of relative prices is the only one that evidently differs between the two samples. It is much larger in the period from 1998 to 2009 and this model provides a better fit when compared to the longer sample (R-squared adjusted equals 0.986 as compared to 0.967) because the real estate boom occurred in the period prior to 2008/2009, and real estate prices started decreasing in the years after (Figure 5).

Table 2: Estimation results 1998 – 2013

Model	Model 1		Model 2		Model 3	
Cointegration tests						
Residual based test						
Test statistic	-2.110		-4.389**		-6.239***	
Error-correction term	-0.219**		-0.405***		-0.514***	
Johansen cointegration						
Model selected using AIC	2		2		2	
H0: none CE	29.68**		47.21**		68.52**	
H0: at most one CE	15.41		29.68		47.21	
H0: at most two CEs	3.76		15.41		29.68	
Long-run coefficients estimates						
Variables	DOLS	VECM	DOLS	VECM	DOLS	VECM
Export demand	2.433***	2.616***	1.912***	2.095***	2.424***	2.354***
Unit labor costs	-0.690***	-0.835***	-0.756***	-0.749***	-0.787***	-0.800***
Governance			0.077***	0.081***	0.075***	0.082***
Relative prices					-0.135**	-0.114*
Constant	-1.416***	-1.514	-0.230	-0.649	-0.958***	-0.844
R-squared adjusted	0.955	0.071	0.983	0.154	0.967	0.204
No. of observations	58	62	52	59	58	59

Notes: *,** and *** denote statistical significance at the 10%, 5% and 1% levels. 2= the level data have a linear trend and there is a constant in the cointegrating vector. CE stands for cointegrating equation. The Akaike information criterion (AIC) is used to determine the optimal length of lags and leads for DOLS and lags for the VAR model. The maximum lag length is set to equal 4.

Source: Authors' calculations

Additionally, we also estimated all model specifications for the whole sample using different proxies for export demand and unit labour costs (Table 3). Instead of export demand of Croatia's main trading partners, we used a proxy for demand of the EU, the US and Russia, and instead of total unit labour costs, we used unit labour costs of the manufacturing sector only.

Table 3: Robustness results 1998 – 2013

Model	Model 1		Model 2		Model 3	
Cointegration tests						
Residual based test						
Test statistic	-4.163**		-6.380***		-6.217***	
Error-correction term	-0.431***		-0.723***		-0.838***	
Johansen cointegration						
Model selected using AIC	2		2		2	
H0: none CE	29.68**		47.21**		76.07***	
H0: at most one CE	15.41		29.68		54.46	
H0: at most two CEs	3.76		15.41		35.65	
Long-run coefficients estimates						
Variables	DOLS	VECM	DOLS	VECM	DOLS	VECM
Export demand	2.768***	2.604***	1.714***	2.059***	2.320***	2.360***
Unit labor costs	-0.560***	-0.532***	-0.601***	-0.589***	-0.592***	-0.623***
Governance			0.145***	0.094***	0.079***	0.086***
Relative prices					-0.153***	-0.135***
Constant	-2.329***	-2.137	-0.187	-0.920	-1.320***	1.195
R-squared adjusted	0.952	0.180	0.979	0.375	0.974	0.455
Number of observations	58	62	52	59	57	59

Notes: ** and *** denote statistical significance at the 5% and 1% levels. 2= the level data have a linear trend and there is a constant in the cointegrating vector. CE stands for cointegrating equation. The Akaike information criterion (AIC) is used to determine the optimal length of lags and leads for DOLS and lags for the VAR model. The maximum lag length is set to equal 4.

Source: Authors' calculations

Results in Table 3 imply there is evidence of cointegration in all model specifications. Estimated coefficients turn out to be statistically significant, and of the same sign and approximately the same size as in the models with different proxies for export demand and unit labour cost.

5. Results and discussion

Results from the narrowest model, Model 1, suggest export demand has a very strong, positive, and statistically significant effect on exports, while unit labour costs proved to be statistically significant and negative. The broader model, Model 2, considers also the governance indicator that turned out to have a small, positive,

and statistically significant effect on exports of goods and services. Cointegration test results for the broadest model, Model 3, imply there is a long-run relationship between exports, export demand, unit labour costs, governance, and the relative price of house prices related to that of manufactured goods prices. Therefore, an increase in foreign demand is strongly related to a rise in exports, and a similar, but less strong effect is observed for an improvement in governance. Higher labour costs apparently decrease exports, as well as higher relative prices. The latter result confirms our hypothesis that a real estate boom contributed to a reallocation of resources from the manufacturing to the construction sector, thus undermining the ability of the tradable sector to meet the growing demand for exports from Central, East and South Europe.

Regarding robustness, Tables 1 and 2 show that our results do not depend on the choice of the estimator. The parameters have the same sign and very similar size regardless of the estimating methodology used (the DOLS or the VECM). Results from Table 3 once again suggest that cointegration is confirmed in all model specifications, suggested by the residual based test, the Johansen test, and the error-correction terms. Estimated coefficients are statistically significant, and of the same sign and size as in the models with different proxies for export demand and unit labour cost. Results from all three types of models, use of different proxies and different estimation methodologies suggest that results are statistically significant and fairly robust.

6. Conclusion

The results of the empirical analysis clearly confirm our hypothesis, allowing us to conclude that real estate boom is indeed a co-culprit for weak export performance and waning Croatian international competitiveness. We show that a relative price distortion in favour of non-tradable sector and the reshuffling of production factors from tradable to non-tradable sectors, (both are the by-products of real estate boom), reduce the ability of exporters to satisfy growing demand for country's exports. As a result, export companies or companies that would have liked to take part in international trade, cannot overcome size limitations and achieve economies of scale necessary for exporting. The contribution of this paper to the literature is twofold. First, we present empirical evidence suggesting that real estate booms can have detrimental effects on exports not only in developed countries but also in post-transition countries experiencing real estate booms. Second, our study offers additional insights into the reasons for the sluggish performance of Croatian export. There are several limitations of this research. We model the behavior of aggregate export of goods and services, but we do not try to disentangle the effect of real estate boom on individual export sectors (manufacturing, hotels and restaurants, other tradable services). We focus

our analysis on total export of goods and services, as services exports constitute an important segment of total exports in Croatia. Moreover, our analysis is limited by inadequate data on real estate prices in Croatia. The only available indicator probably underestimates the real estate prices rise in the late 1990s and early 2000s, which in turn means that inter-sectoral reallocation might have had an even bigger impact on export performance than the one detected in this study. In future this study could be extended to include only the merchandise trade or segments of tradable services, but it could also be extended to include other post-transition European countries that experienced upsurge in real estate prices prior to 2008 crisis, such as Estonia, Latvia, or Bulgaria.

The results of this paper suggest that real estate booms should be of special concern to policymakers in developing economies who depend on exports in order to catch up to the income level of their developed counterparts. Thereby, two approaches are possible. The first approach would include active policies aimed at curbing the real estate boom and cooling down the construction and real estate sector. The second approach would aim at alleviating supply-side constraints of the tradable sector that arise as a consequence of the distortion of relative prices. Both approaches are however highly contented and difficult to implement.

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Uspon sektora nekretnina i podbačaj hrvatskog izvoza

Marina Tkalec[1], *Maruška Vizek*[2]

Sažetak

Cilj ovoga rada je ocijeniti utjecaj premještanja resursa iz prerađivačkog u sektor nekretnina na izvoznu aktivnost u Hrvatskoj, maloj, otvorenoj, post-tranzicijskoj ekonomiji koja je tijekom proteklog desetljeća iskusila uspon sektora nekretnina. U analizi slijedimo rad Égerta i Kierzenkowskog (2014) s obzirom na to da testiramo ima li uspon cijena nekretnina negativan utjecaj na izvoz. U tu svrhu koristimo kvartalne podatke u razdoblju od prvog tromjesečja 1998. do trećeg tromjesečja 2013. godine te ocjenjujemo izvozne jednadžbe koristeći različite procjenitelje kointegracije: najveću vjerojatnost (engl. maximum likelihood) i metodu dinamičkih najmanjih kvadrata. Naši rezultati pokazuju da je iskrivljenost relativnih cijena u korist nerazmjenjivih sektora (građevinarstva i sektora nekretnina), koja je neposredni nusproizvod rasta cijena nekretnina, imala utjecaj na podbačaj hrvatskog izvoza. Također smo pokazali da je nepovoljna troškovna konkurentnost te nesposobnost države da uvede ekonomske politike koje promiču gospodarski razvoj privatnog sektora nepovoljno utjecala na izvoz u promatranome razdoblju. Osnovni zaključak rada je da brza ekspanzija neutrživog sektora u zemlji s ograničenom ponudom proizvodnih faktora može imati negativne učinke na sposobnost utrživog sektora da poveća svoju proizvodnju i natječe se na međunarodnim tržištima.

Ključne riječi: *konkurentnost, izvoz, prerađivačka industrija, nekretnine, premještanje resursa*

JEL klasifikacija: *C32, F10, F14, O14*

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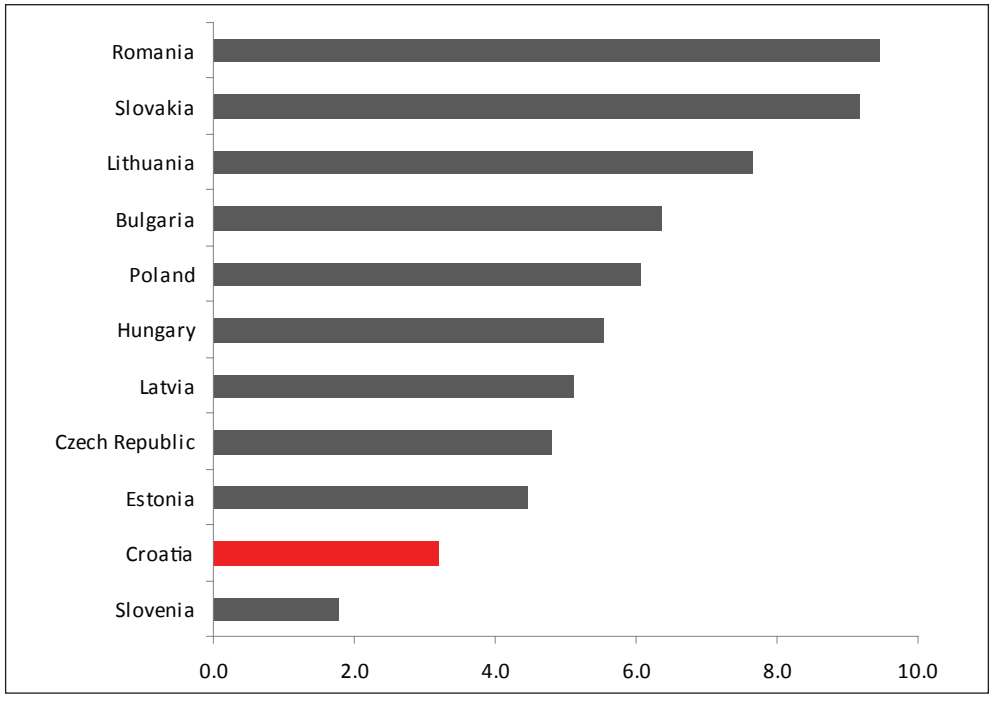
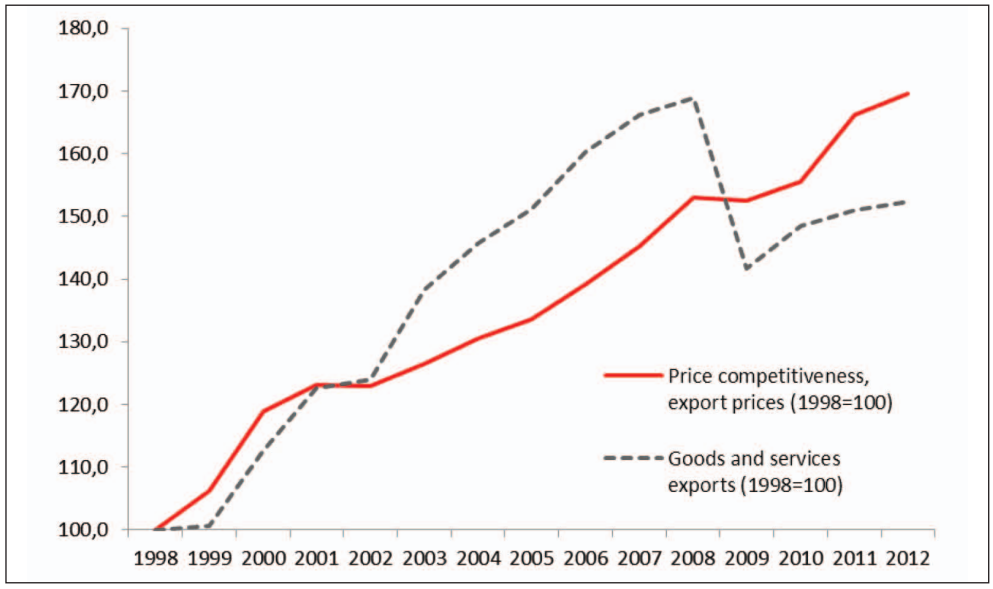
Appendix

Figure 1: Export market shares in world exports by value (goods and services; average annual growth rate in the period 2000-2008)



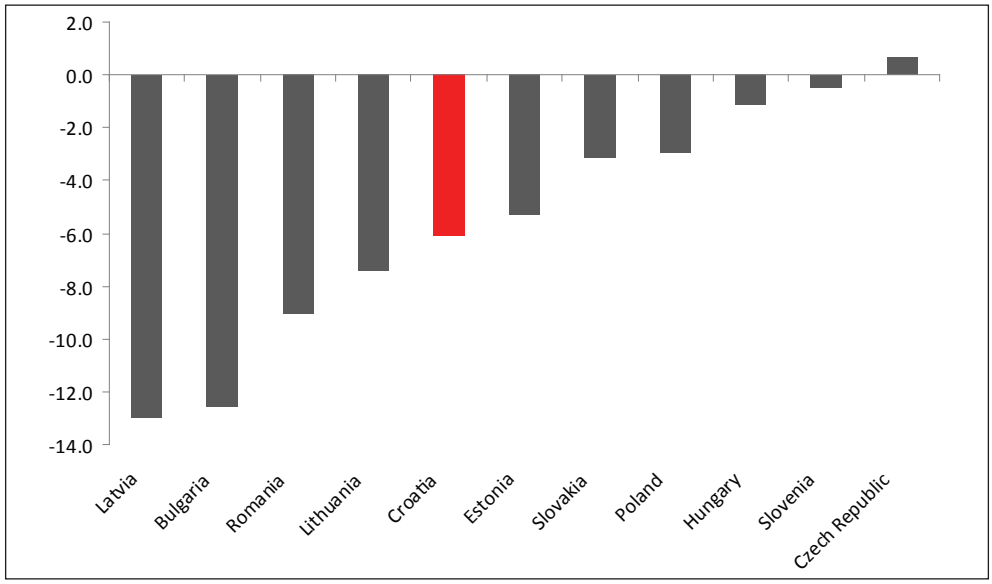
Source: Eurostat

Figure 2: Total exports and price competitiveness measured by export prices – 1998=100



Source: Croatian Bureau of Statistics

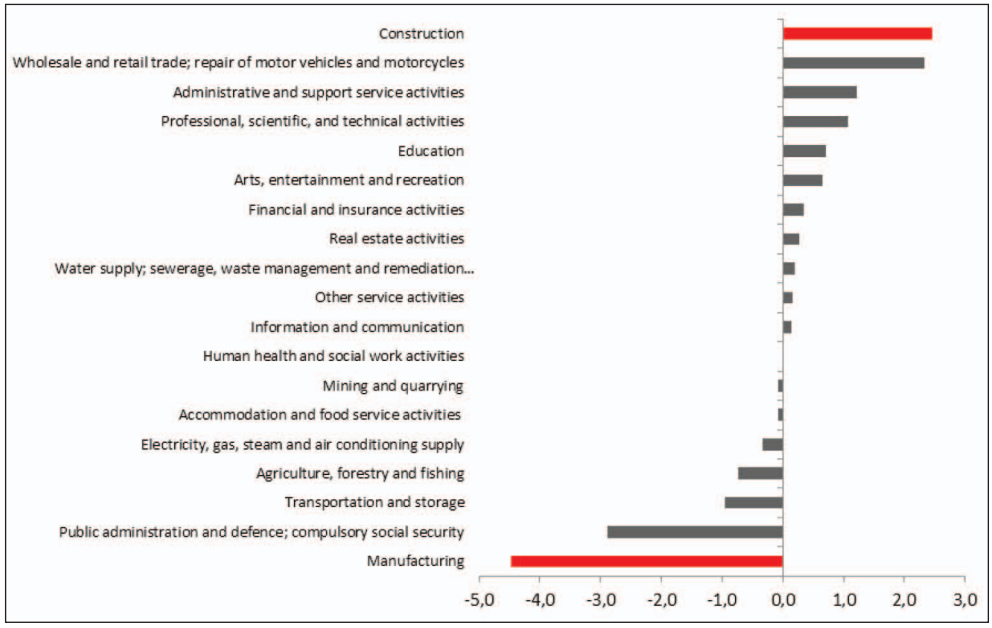
Figure 3: Trade balance in the 2000-2009 period (goods and services; as percent of GDP; period average)



Source: Eurostat

Figure 4: Change in the share of employees by activity in the period from 2000 to 2009

– in percent



Source: Croatian Bureau of Statistics