

Growing Together: Croatia and Latvia

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Abstract

We compare and contrast the economic growth performance of Croatia and Latvia since the collapse of communism in 1991 in an attempt to understand better the extent to which the growth differential between the two countries can be traced to increased efficiency in the use of capital and other resources (intensive growth) as opposed to sheer accumulation of capital (extensive growth). On the basis of a simple growth accounting model, we infer that advances in education at all levels, good governance, and institutional reforms have played a significant role in raising economic output and efficiency in both Croatia and Latvia. The EU perspective made a more significant contribution to growth in Latvia than in Croatia, even if Latvia's immediate post-accession boom proved unsustainable.

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GROWING TOGETHER: CROATIA AND LATVIA *

1. Historical introduction

This paper aims to add to a growing strand of comparative studies of country pairs.¹ At the time of the Soviet Union and Yugoslavia's disintegration around 1991 Latvia and Croatia's relative economic positions within their federations were broadly comparable. In both countries, real income per person was above the federal average. At that time, in 1991, Croatia's gross domestic product (GDP) per person was appreciably higher than that of Latvia. During 1989-1993, Croatia and Latvia's per capita GDP sank by a third to a half in real terms, and thereafter grew together after reversing the initial output decline at the beginning of the transition from plan to market. Starting out with a lower level of initial per capita income, Latvia was on its way to catching up with Croatia until the financial crisis hit the Baltic country hard in 2008. Thus, Croatia managed to stay ahead (*Figure 1*). Two intriguing questions that arise in this context are why Latvia grew so much faster than Croatia and what role the different timing of European Union (EU) accession of the two countries and their concomitant institutional change may have played in their growth performance.

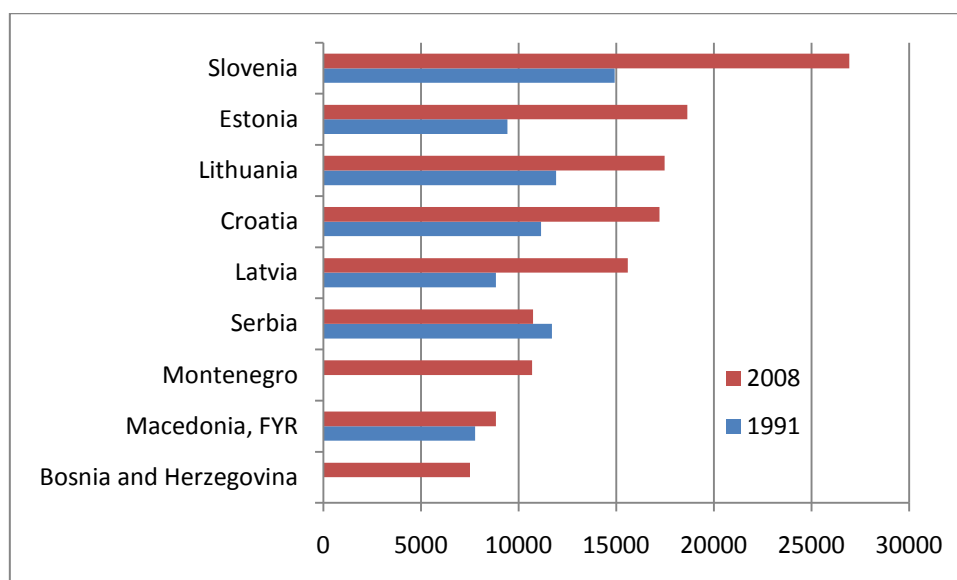
This paper aims to shed light on these questions by applying standard growth economics to a comparison of the recent growth record of the two countries. In an earlier paper, we compared Estonia and Georgia by reviewing the main determinants of their growth, and concluded that Estonia beat Georgia on virtually every score. Unsurprisingly, therefore, Estonia and Georgia grew apart after 1991. Based on simple growth accounting, education and efficiency were found to make similar contributions to growth, while investment made a relatively minor contribution. Hence, growth was primarily intensive rather than extensive. In this paper, we report by similar methods how Croatia and Latvia grew together after 1991, how Latvia caught up, and how Croatia remains ahead.

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¹ Other examples include Gylfason (2006), Barry *et al.* (2009), and Henry and Miller (2009). We draw heavily on Gylfason and Hochreiter (2009).

Croatia and Latvia are both small (64,589 km², population 4.5 million and 56,594 km², population 2.2 million). Both are poorly endowed with natural resources, which may be good for their long-run growth potential as suggested by Sachs and Warner (1995) and others, and both had cities or regions that prospered long ago. Latvia prospered when Riga and other Latvian cities became part of the Hanseatic League from 1282 onward. Croatia, or, more accurately, the Republic of Ragusa/Dubrovnik, also thrived through vivacious trade from around 1360 onward.

**Figure 1. Gross Domestic Product per capita 1991 and 2008
(Constant 2005 international dollars at purchasing power parity)**



Source: World Bank, *World Development Indicators 2010*.
Data for the Republic of Kosovo are not available.

Both countries share a history of foreign rule and influence: Latvia, that of Germany, Poland, Sweden, and Imperial Russia from 1710 onward, and Croatia as part of Austria and Hungary and as a tribute-obliged vassal state of Venice and the Ottoman Empire. Yet, economically speaking, there were periods when foreign dominance did not inhibit economic prosperity (e.g., Southern Latvia’s “golden age” in the 17th century and Ragusa/Dubrovnik under Ottoman vassalage in the 15th and 16th centuries). Overall, Latvia fared less well in economic terms during Russian rule than Croatia did under Austrian, Hungarian, and Ottoman supremacy.

Both countries became independent in 1918. Latvia, after a few chaotic years,

remained independent until it was occupied by Soviet Russia in 1940 under the Hitler-Stalin Pact. After the collapse of the Austro-Hungarian Empire in 1918 Croatia chose to form a new state with Serbia and Slovenia, the “Kingdom of Slovenes, Croats and Serbs,” renamed as the “Kingdom of Yugoslavia.” Both countries were occupied by Germany in 1941.

Between the end of World War II and renewed independence in the early 1990s both countries were part of larger socialist or communist states. There were, however, important differences. Latvia, one of the fifteen Socialist Soviet Republics, had her economy organized along the lines of a classical socialist regime based on central planning, “decreed prices,” monopolized foreign transactions, and absence of market institutions and markets. Croatia was an integral part of the non-aligned Socialist Federal Republic of Yugoslavia that was politically and economically more open than eastern-bloc countries. Private enterprise in agriculture, trade, and small business played a much larger (and politically tolerated) role and larger (nationalized) enterprises had more freedom and room for manoeuvre through the evolving system of workers’ self management.

Latvia, after regaining independence in 1991, quickly embarked on bold and decisive political, institutional, and economic reforms that were carried out by successive governments. We surmise that the prospect of rapid EU integration, “the EU perspective,” provided a critical anchor for sustained political, institutional, and economic reforms across the political spectrum.² Further, Latvia benefited from being close to the Nordic countries as well as to Brussels. Croatia had less access.

Within less than fifteen years after regaining independence, Latvia was able to accede to the EU. In 2004, Latvia also joined NATO. Until 2008, Latvia’s real growth rate was the highest among the EU states but also one of the most volatile ones. Purifield and Rosenberg (2010) describe the “EU Membership Boom” of Baltic countries. Initially, the country had planned adopting the euro around 2007. Then the financial crisis struck. Latvia was hit hardest of all, with real GDP declining by a whopping 22 percent between 2007 and 2009. The country needed a substantial coordinated multilateral financial support package totaling EUR 7.5 billion provided

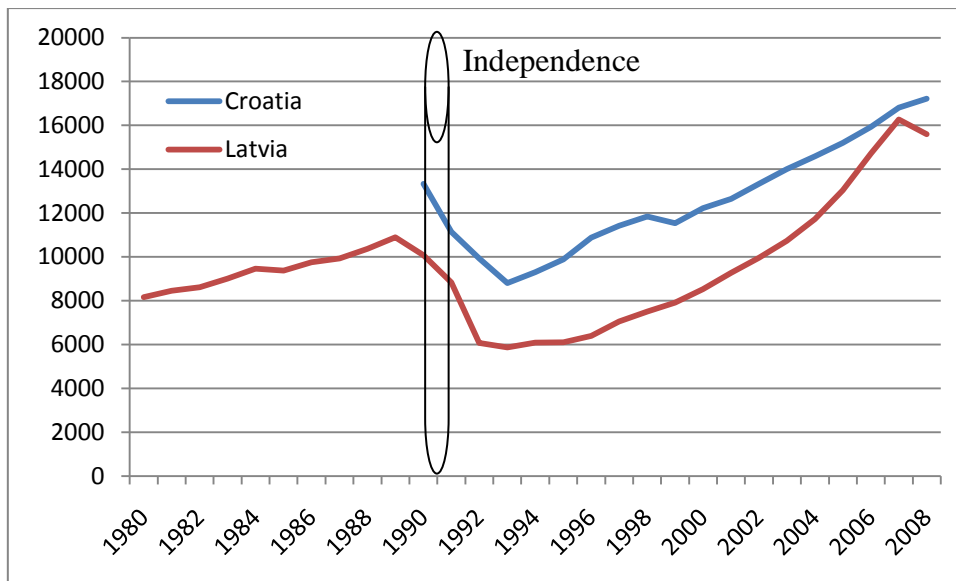
² The EU perspective is a key factor today behind economic, institutional, and political developments in the Western Balkans as a whole.

by the IMF (~EUR 1.7 billion), the EU (~EUR 3.1 billion), the World Bank (EUR 0.4 billion), and the Nordic governments and other bilateral creditors (~EUR 2.3 billion) to stabilize the economic and financial situation and to put into place structural reforms.

In contrast, Croatia, after seceding from Socialist Federal Republic of Yugoslavia in 1991, suffered a four-year war of independence with the Federal Republic of Yugoslavia, and only in 1995 could start with EU integration, which is expected to lead to EU membership in 2012 or 2013. With an average real growth rate of around five percent per year over the last decade, Croatia's growth performance has been less spectacular than that of Latvia, but growth has also been much less volatile. Naturally, Croatia was also significantly affected by the financial crisis, but much less so than Latvia. Croatia saw its real GDP contract by a cumulative 3.6 percent³ from 2007 to 2009, and weathered the economic storm without needing an international financial support package. Earlier, as *Figure 2* shows, Latvia had taken a deeper and longer lasting plunge. Latvia's per capita GDP fell by almost a half from 1989 to 1993 while Croatia's per capita GDP contracted by a third. From 1991, Latvia's per capita GDP has risen from 79 percent of Croatia's per capita GDP to 90 percent in 2008.

Figure 2. Gross Domestic Product per capita 1980-2008
(Constant 2005 international dollars at purchasing power parity)

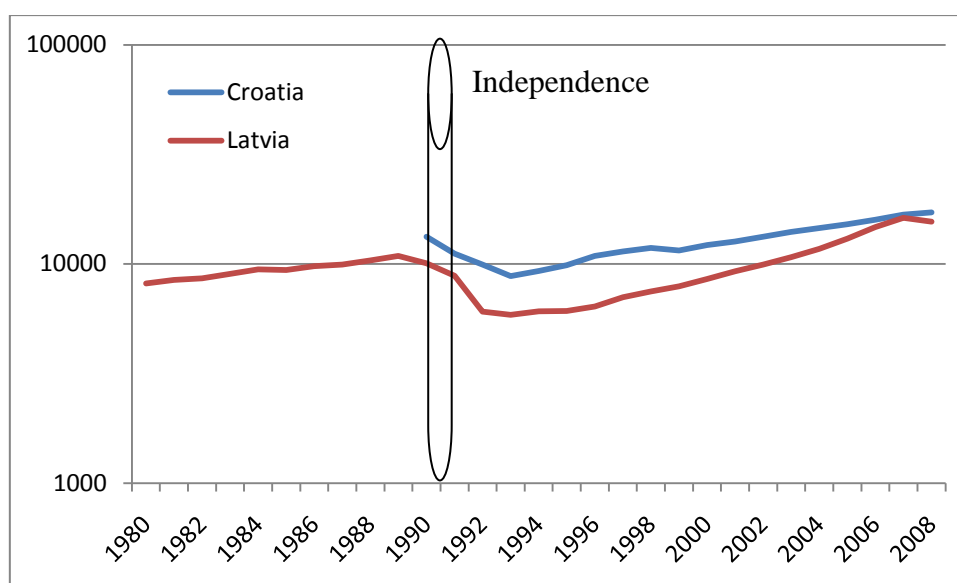
³ Croatia's real GDP contracted by 5.8 percent in 2009 but showed some growth in 2008. For more on growth in Croatia, see Moore and Vamvakidis (2008).



Source: World Bank, *World Development Indicators 2010*.

The remainder of the paper is organized as follows. As in Gylfason and Hochreiter (2009), Section 2 lays out, in the simplest possible terms, the theoretical framework guiding the discussion to follow. In Section 3, selected economic, political, and social indicators are employed to illuminate the possible reasons for the economic trajectories of the two countries under review and how they differ. We present a simple growth accounting computation in an attempt to quantify the broad contours of the contributions of investment, education, and efficiency, including labor market arrangements and governance, to the income and growth differential between the two countries.⁴ In Section 4, before summarizing our main findings, we briefly discuss the policy implications of the growth comparisons of the two countries and suggest potential lessons for other countries that lag behind their erstwhile equals.

Figure 3. Gross Domestic Product per capita 1980-2008
(Constant 2005 international dollars at purchasing power parity, logarithmic scale)



Source: World Bank, *World Development Indicators 2010*.

⁴ Regression analysis along the lines of Schadler *et al.* (2006) is beyond the scope of the paper. Our sample period, 1991-2008, is too short for full-fledged growth econometrics.

2. Analytical Background

Economic growth can be either *extensive*, driven forward by the accumulation of dead capital, or it can be *intensive*, in which case growth springs from more efficient use of existing capital and other resources. Among the numerous alternative ways of promoting economic and social efficiency, one of the most obvious is the accumulation of live capital – that is, human capital – through education, on-the-job training, and health care. There are many other ways as well to increase efficiency and economic growth. Adam Smith and David Ricardo showed how free trade can empower individuals, firms, and countries to break outside the production frontiers that, under autarky, would confine them to lower standards of life. Other examples abound, as the theory of endogenous economic growth and the empirical growth literature of recent years have made clear.

In the rapidly advancing literature on growth in formerly centrally planned economies (see, e.g., Fischer and Sahay, 2000, and Campos and Coricelli, 2002),⁵ it is now widely recognized that the quality of institutions and good governance can help generate sustained growth and so can also various other factors that are closely related to economic organization, institutions, and policy (Acemoglu and Johnson, 2005, and Dixit, 2004).⁶ We want to understand whether the growth differential between Croatia and Latvia since 1991 can be traced mostly to efficiency (i.e., intensive growth), as we suspect, rather than accumulation (i.e., extensive growth).

A. Why Per Capita Outputs Differ

To set the stage, consider this Cobb-Douglas-type production function with constant returns to scale:

$$(1) \quad Y = AH^aK^bN^cL^{1-a-b-c}$$

We denote real GDP by Y , total factor productivity (TFP) – or, if you prefer, efficiency – by A , human capital by H , real capital by K , natural capital, including land, by N , and raw labor by L . The four exponents are the output elasticities of the

⁵ For an excellent survey, see Havrylyshyn (2001).

⁶ Klomp and Haan (2008) report that democracy also reduces economic volatility.

inputs, and lie between zero and one. By dividing through the production function by labor, we obtain this standard expression for output per person:

$$(2) \quad \frac{Y}{L} = A \left(\frac{H}{L}\right)^a \left(\frac{K}{L}\right)^b \left(\frac{N}{L}\right)^c$$

Hence, output per capita depends on four factors: (a) Efficiency, (b) Human capital per person, (c) Capital/labor ratio, and (d) Natural capital per person.

Two comments about this classification are in order. First, if it so happened that human capital, real capital, and natural capital all grew at the same rate as the labor force, then advances in efficiency (A) would remain as the sole source of economic growth, that is, growth of output per person. Second, like plants, different types of capital grow at different rates. While experience suggests that real capital grows at approximately the same rate as output over long periods, leaving the capital/output ratio roughly constant over time, human capital can easily grow more rapidly than real capital, while natural capital – especially nonrenewable natural capital, but also some renewable natural capital such as fish and timber – tends to grow less rapidly than real capital. This, by the way – or think of fixed land, if you prefer – is why increased population growth, against common intuition, tends to slow down economic growth.

With different rates of growth of the different determinants of growth, the rate of growth of per capita output must be a weighted combination of the growth rates of the different inputs. We can simplify the story somewhat by acknowledging that, apart from farmland, natural capital plays an insignificant macroeconomic role in the two countries under review, allowing us to set $c = 0$ in the production function. If we assume $a = b = 1/3$ in equations (1) and (2), the sum of the output elasticities of H and L – that is, of total labor, if you like – is $2/3$ compared with an output elasticity of capital of $1/3$, a familiar constellation of parameters (Mankiw, Romer, and Weil, 1992).⁷ Further, we can impose a constant capital/output ratio on the production function, as is customary in parts of the growth literature. Those two modifications reduce the number of the determinants of long-run growth in our model from four to three: efficiency A , human capital per person H/L , and the capital/output ratio K/Y :

⁷ Senhadji (2000) estimates aggregate production functions for 88 countries, but neither Latvia nor Croatia is included in his sample.

$$(3) \quad \frac{Y}{L} = A^{\frac{1}{1-b}} \left(\frac{H}{L}\right)^{\frac{a}{1-b}} \left(\frac{K}{Y}\right)^{\frac{b}{1-b}} = A^{1.5} \sqrt{\left(\frac{H}{L}\right) \left(\frac{K}{Y}\right)}$$

Even so, our post-communist sample period 1991-2007 dictates an emphasis not so much on the long-run growth of potential output as on the medium-term growth of the actual level of output.

In our equations above, the efficiency parameter A comprises a variety of factors, among them technological advances and other types of efficiency gains from various sources, including internal as well as external trade, “good” institutions, and “good” governance (see Williamson, 2005, and Marsiliani and Renström, 2007). Governance, in turn, is a broad concept, and subsumes managerial, fiscal, monetary, financial, and external governance, each of which comprises several components. The examination of some of these “unbundled” governance factors is at the core of our attempt to answer the question of why Latvia almost caught up with Croatia. However, we also need to compare human capital per person in the two countries as well as their capital/output ratios.

Human capital per person depends on education as measured by the number of years u at school in the spirit of Mincer (1974):

$$(4) \quad \frac{H}{L} = e^{vu}$$

Here v is a positive number estimated from labor market data and u is the duration of education measured in years at school. Without education (i.e., with $u = 0$), there would be no need to distinguish human capital from raw labor, so $H = L$. Taking logarithms and differentiating, we have

$$(5) \quad \frac{d \log H}{du} = v$$

Therefore, v measures the proportional increase in human capital resulting from each additional year at school, a number like 0.1 according to several labor market and growth studies of advanced economies (see, e.g., Bils and Klenow, 2000).

We take the capital/output ratio to be proportional to the investment rate I/Y in accordance with standard capital theory where $K_t = I_t + (1 - \delta)K_{t-1}$ without adjustment costs, I_t is gross investment in year t , and δ is the rate of depreciation:

$$(6) \quad \frac{K}{Y} = \left(\frac{1+g}{g+\delta} \right) \frac{I}{Y}$$

Here g is the rate of growth of output and capital.

Substitution of equations (4) and (6) into equation (3) gives

$$(7) \quad \frac{Y}{L} = A^{1.5} \sqrt{e^{vu} \left(\frac{1+g}{g+\delta} \right) s}$$

where s represents the investment rate I/Y . If we allow efficiency A , years of schooling u , and investment rates s to differ between Croatia and Latvia while the productivity of schooling v , the growth of the capital stock g , and depreciation δ are assumed the same in the two countries, we can express the ratio of per capita output $y = Y/L$ in the two countries simply as follows:

$$(8) \quad \frac{y_C}{y_L} = \left(\frac{A_C}{A_L} \right)^{1.5} \sqrt{e^{u_C - u_L} \left(\frac{s_C}{s_L} \right)}$$

B. From Output Per Person to Output Per Hour Worked

Our measure of economic performance, output per person, differs from the ideal conceptual measure, output per hour worked, which takes explicitly into consideration the work effort behind the output produced. By definition,

$$(9) \quad \frac{Y}{L} = \frac{Y}{Q} \frac{Q}{L}$$

where Q is hours worked. Hours of work per person, Q/L , can be written as

$$(10) \quad \frac{Q}{L} = \left(\frac{N+U}{L} \right) \left(\frac{Q}{N} \right) \left(1 - \frac{U}{N+U} \right)$$

where N is employment, U is unemployment, $(N+U)/L$ is the labor force participation rate, Q/N is hours of work per employed person, and $U/(N+U)$ is the unemployment rate. Replacing labor (i.e., population) L by hours worked Q in equation (3), we have

$$(11) \quad \frac{Y}{Q} = A^{\frac{1}{1-b}} \left(\frac{H}{Q}\right)^{\frac{a}{1-b}} \left(\frac{K}{Y}\right)^{\frac{b}{1-b}} = A^{1.5} \sqrt{\left(\frac{H}{Q}\right) \left(\frac{K}{Y}\right)}$$

This means that

$$(12) \quad \frac{Y}{L} = A^{1.5} \sqrt{\left(\frac{H}{Q}\right) \left(\frac{K}{Y}\right)} \cdot \frac{Q}{L} = A^{1.5} \sqrt{\left(\frac{H}{L}\right) \left(\frac{K}{Y}\right) / \frac{Q}{L}} \cdot \frac{Q}{L} = A^{1.5} \sqrt{\left(\frac{H}{L}\right) \left(\frac{K}{Y}\right) \left(\frac{Q}{L}\right)}$$

This simple extension of our model shows that hours worked per person – and thus, by equation (10), labor force participation, hours worked per employee, and unemployment – make an independent contribution to per capita output. The corresponding expression for output per hour worked, from equation (11), is

$$(13) \quad \frac{Y}{Q} = A^{1.5} \sqrt{\left(\frac{H}{L}\right) \left(\frac{K}{Y}\right) / \frac{Q}{L}}$$

Equation (13) suggests that an increase in hours worked per person reduces output per hour worked, i.e., reduces labor productivity.

Our empirical strategy aims to provide a rudimentary quantitative assessment of the contributions of education, investment, and labor market institutions to the relative per capita incomes of Croatia and Latvia by evaluating the expressions under the square root in equation (12). This will enable us to attribute the rest of the income differential between the two countries to differences in efficiency, the term outside the square root on the right-hand side of equation (12). This requires a comparative review of a number of different economic, political, and social indicators to which we now turn.

3. Quantitative Evidence

We are aware that less than twenty years of macroeconomic data following the collapse of the Soviet Union that started in 1989 is too short a period to be amenable

to a fully fledged long-run economic growth analysis in the spirit of, for example, Hall and Jones (1999). Instead, against the background provided in the preceding section, we intend to ask whether the pattern of those macroeconomic variables that recent growth research has identified as potentially important determinants of per capita output and thereby also ultimately of long-run economic growth in cross-country comparisons have behaved in ways that can shed some light on economic developments in Croatia and Latvia since independence. To this we add a simple growth accounting computation intended to suggest the relative contributions of investment, education, labor market institutions, and efficiency to the income differential between the two countries. Fully fledged growth accounting in which output growth could be traced in quantifiable proportions to all underlying inputs and to different aspects of the efficiency with which they were used is beyond the scope of this paper.

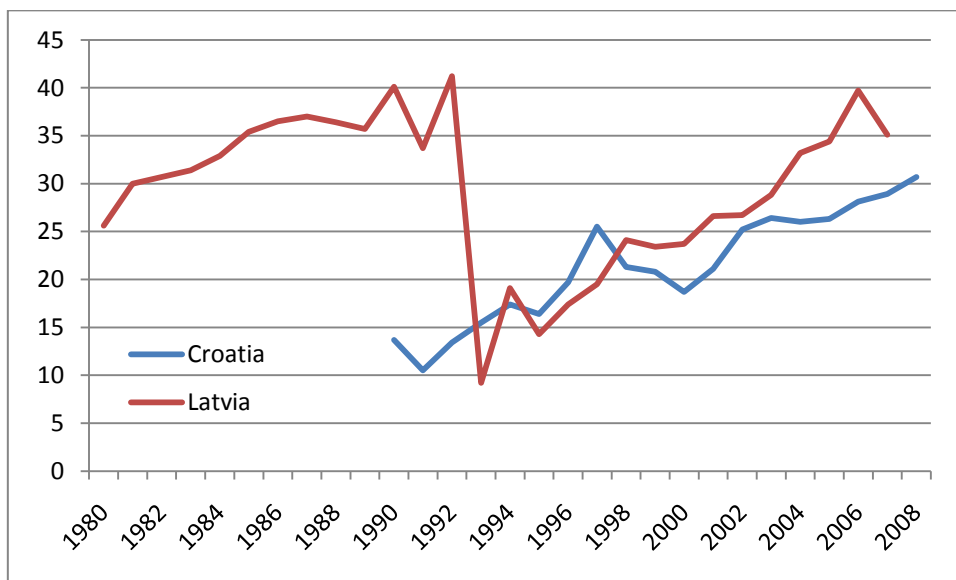
A. Investment, Education, and Exports

Let us start with domestic investment, a key determinant of the capital/labor ratio and of economic growth. Which of the two countries has put aside more resources for capital formation since 1990? As *Figure 4* shows, both countries have seen a surge of machinery, equipment, and building investment. Croatia invested 21 percent of GDP in machinery and equipment on average from 1989 to 2007 compared with 27 percent in Latvia. These are the investment rates needed to evaluate the second term under the square root in equation (8).

The same logic applies to investments in human capital. *Figure 5* shows that nearly all Latvian youngsters attend secondary schools compared with 90 percent in Croatia. In 2007, over two thirds of young Latvians attended colleges and universities compared with 41 percent in Croatia. Before the end of this section, we will distill from these numbers estimates of years of schooling that we need to evaluate the first term under the square root in equation (8). In recent years, public and private expenditure on education amounted to about 4.5 percent of GDP in Croatia compared with 5.5 percent in Latvia. None of these input measures – school enrolment rates, years of schooling, or expenditures on education – capture the quality of education, however, a common problem in quantitative education research. With early reforms,

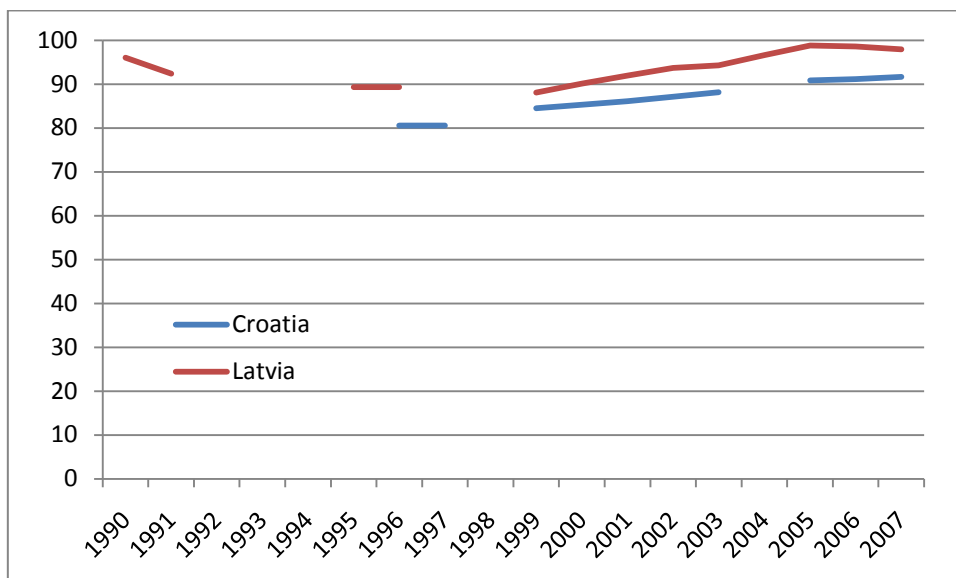
Latvia sought harmonization with EU standards, another benefit of the aforementioned early EU perspective. Education reform in Croatia started more recently.

Figure 4. Gross capital formation 1980-2007 (% of GDP)



Source: World Bank, *World Development Indicators 2009*.

Figure 5. Secondary-school enrolment 1990-2007 (% gross)

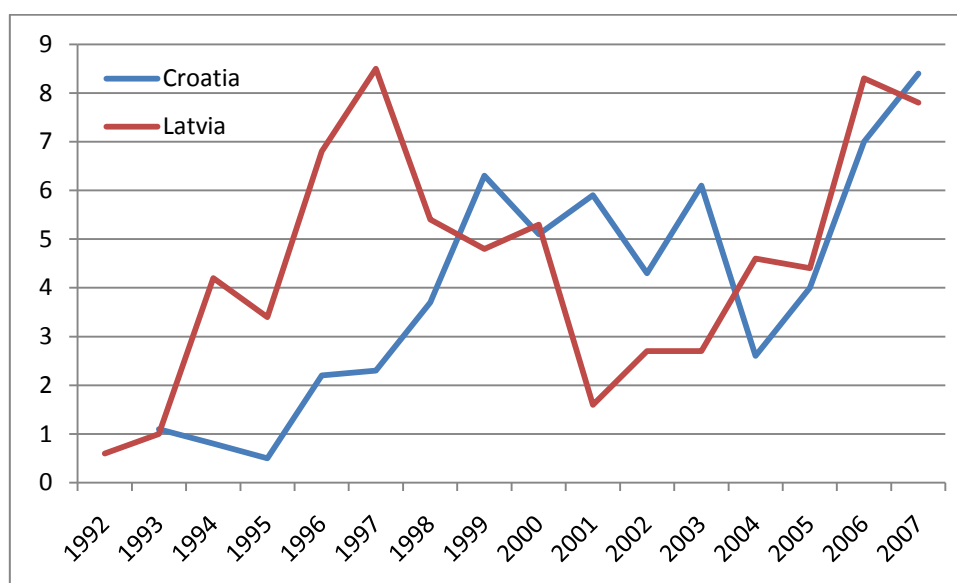


Source: World Bank, *World Development Indicators 2009*.

Other indicators suggest broad similarities. Latvia has slightly more personal computers per 100 inhabitants than Croatia. In internet users per 100 inhabitants, Latvia is one to two years ahead of Croatia. On the other hand, Croatia has more mobile phone subscribers per 100 inhabitants than Latvia. Education and technological sophistication are clearly conducive to a business-friendly climate for domestic as well as foreign investment.

Understandably, foreign investment was virtually nonexistent in the early 1990s, but since then Latvia has, on average, attracted more capital from abroad than Croatia. Specifically, net inflows of foreign direct investment (FDI) in Latvia amounted to five percent of GDP 1992-2007 on average compared with four percent in Croatia (*Figure 6*). Latvia has been somewhat more open toward the influx of foreign capital.

Figure 6. Foreign Direct Investment 1992-2007 (Net inflows, % of GDP)



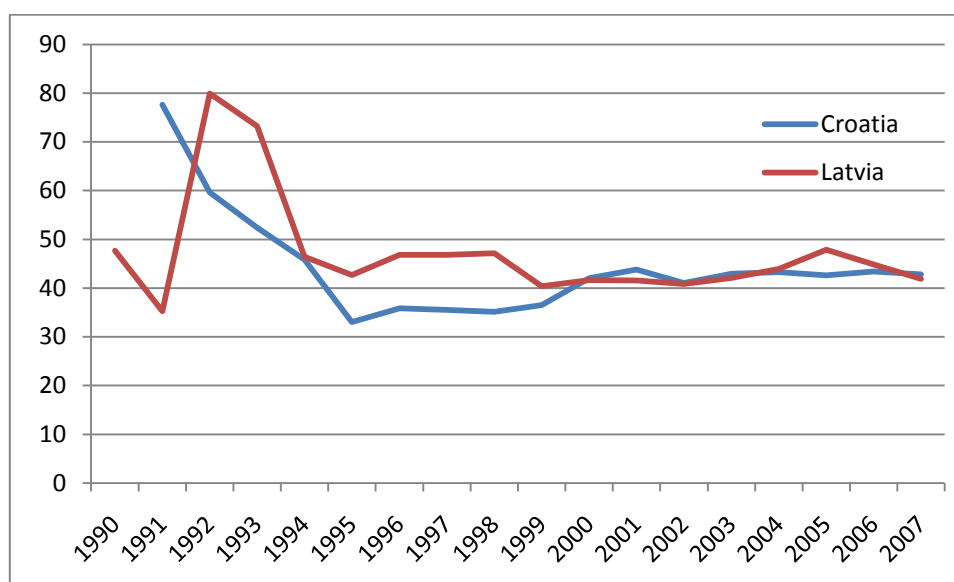
Source: World Bank, *World Development Indicators 2009*.

A similar picture emerges if we consider openness toward foreign trade. Exports of goods and services from Latvia amounted to 47 percent of GDP on average 1990-2008, slightly more than the 44 percent in Croatia (*Figure 7*). The slightly lower Croatian average can be traced to the subdued export figures in the first few years following the war of independence. With the recovery of tourism, and later on the

strengthened EU perspective, Croatia's export performance caught up with that of Latvia.

Domestic and foreign investment and education at all levels are key sources of the accumulation of real capital and human capital. Together and separately, they are important determinants of per capita output and economic growth. As far as those two time-honored pillars of productivity and growth are concerned, Latvia marginally outperformed Croatia during the transition period, allowing Latvia to grow faster than Croatia. Today, even considering the onslaught of the financial crisis, both countries enjoy a markedly higher standard of life than they did under Soviet rule or within Yugoslavia (recall *Figures 1-3*).⁸

Figure 7. Exports of goods and services 1990-2007 (% of GDP)



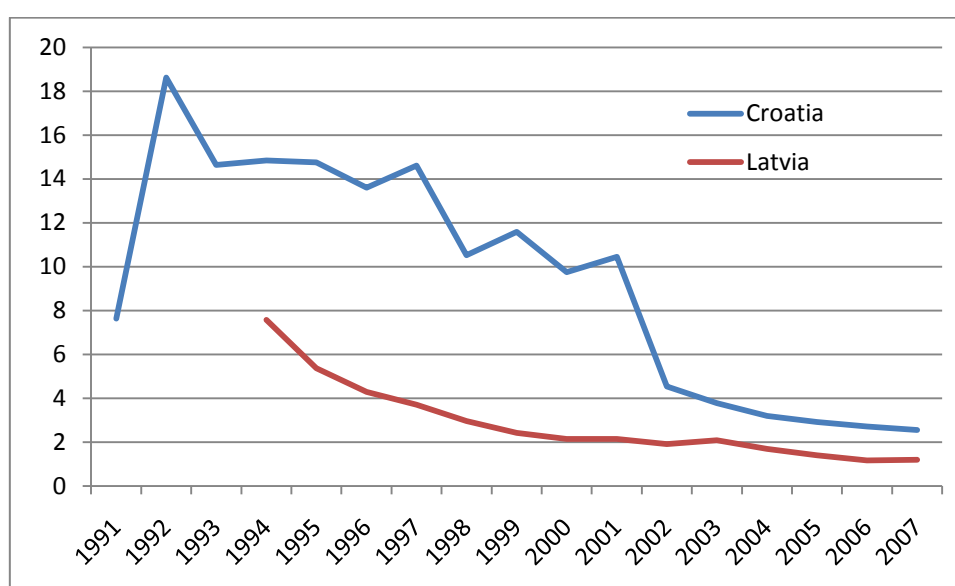
Source: World Bank, *World Development Indicators 2009*.

Croatia and Latvia both embraced liberal trade policies around the mid-1990s but to a lesser extent than Estonia did after regaining independence. Still, Latvia opened up earlier than Croatia and started from a lower initial level of tariff incidence. Likewise, import restrictions were dismantled in both countries, but, again, at a slower

⁸ Comparisons of data from the Soviet time with those of the post-Soviet period need to be taken with a grain of salt. Hence, the statement in the text has to be interpreted with care, especially if the cost of queuing, product range and quality, and so forth, is included in the GDP measure.

pace and starting from a higher initial level in Croatia than in Latvia. During the war of independence Croatia had to rely to a considerable extent on import duties for public revenue. More recently import duties have come down significantly, stabilizing at less than two percent of tax revenue in Latvia and a bit more than two percent in Croatia (*Figure 8*). Similarly, it takes, on average, somewhat longer for importers to clear customs in Croatia (two days) than in Latvia (1.7 days). Free trade is good for growth.

Figure 8. Customs and other import duties 1991-2007 (% of tax revenue)



Source: World Bank, *World Development Indicators 2009*.

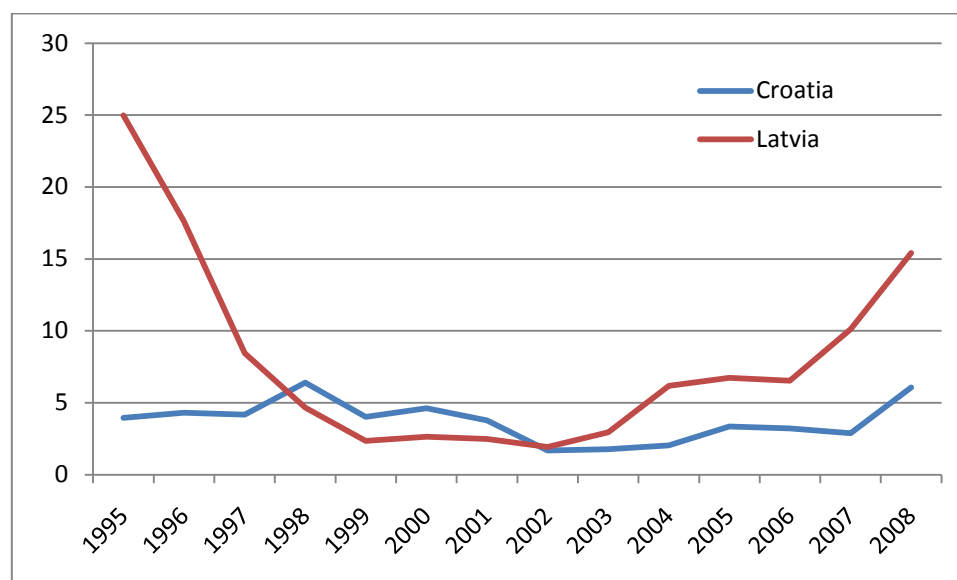
B. Inflation and Exchange Rates

Price stability is also good for growth. After an initial bout of hyperinflation to eliminate the monetary overhang (and, in the case of Croatia, to finance the war of independence), both countries managed to bring inflation down to low single-digit numbers. However, as a result of severe overheating, Latvia's inflation rate jumped again to around 15 percent per year at the time of the bursting of the credit and real estate bubbles in 2007 and when the financial crisis struck (*Figure 9*). High inflation rates are a common occurrence in countries with demand and credit booms such as Latvia (see Bakker and Gulde, 2010).

Related to the different rates of inflation, the process of monetization of economic transactions has been slower in Latvia than in Croatia (*Figure 10*). High inflation tends to hold back economic growth through various channels. It tends to do so by reducing financial depth, among other things, or, if you prefer, by discouraging the accumulation of financial working capital, thus depriving the economic system of necessary lubrication in the form of adequate liquidity. Insufficient lubrication hampers economic efficiency and growth.

We now turn to the potential role of the exchange rate regime in fostering economic growth and financial stability. Traditionally, the debate about regime choice focused on the trade-off between exchange rate flexibility and economic growth. As far as the Transition Economies and Emerging Markets are concerned the empirical evidence is mixed. While Levy-Yeyati and Sturzenegger (2003) report that low inflation and slow growth tend to go hand in hand in countries with fixed exchange rate regimes, Gosh, Gulde, and Wolf (2000) conclude that countries with hard pegs have not only less inflation but also more growth. Recently, Gosh *et al.* (2010) find that the key trade-off is not between inflation or price stability and growth (volatility) but rather between macroeconomic performance (price stability and growth) and the ease of external adjustment and the risk of financial crisis (*op. cit.*, p. 26).

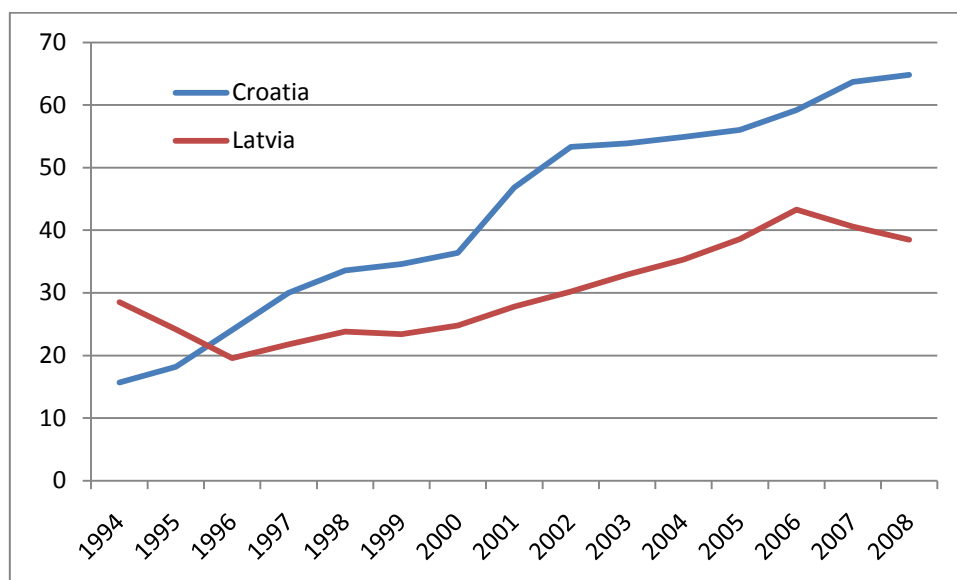
Figure 9. Inflation 1995-2008 (% , consumer prices)



Source: World Bank, *World Development Indicators 2009*.

As regards the exchange rate regime of the two countries under review, we have to differentiate between the *de jure* and the *de facto* regime. In the case of Latvia, the two classifications coincide. Latvia, after an initial period of flexible exchange rates, moved in 1994 to a peg with a narrow band of one percent, mimicking a currency board, first against the SDR and then against the euro as of January 2005. Croatia introduced the kuna after the war of independence in 1994 and *de jure* adopted a system of managed floating. *De facto*, however, the float has been very tightly managed. Reinhart and Rogoff (2004) go as far as classifying the Croatian exchange rate regime as a *de facto* band first around the Deutsche Mark and then around the euro.

Figure 10. Financial depth 1994-2008 (Broad money as % of GDP)

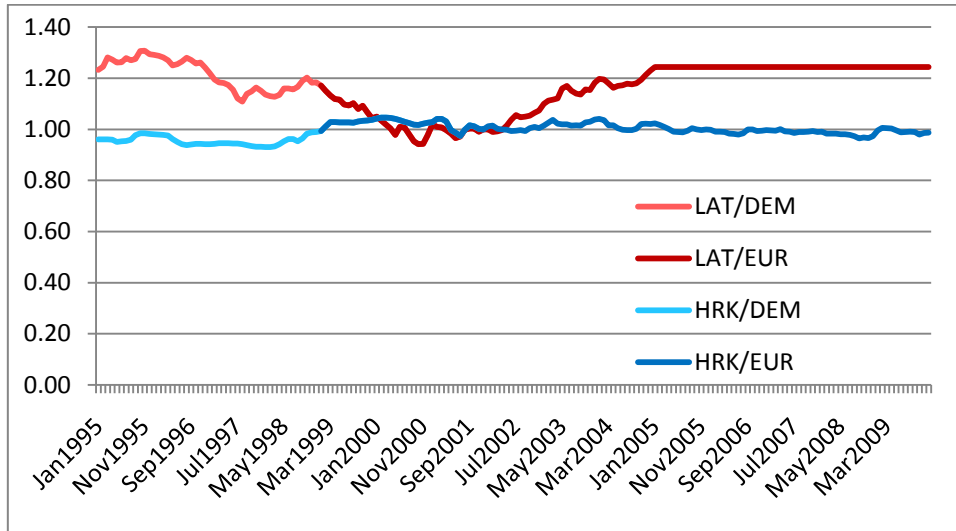


Source: World Bank, *World Development Indicators 2009*.

The *de facto* similarity of the exchange rate regime (see *Figure 11*) should not be surprising because, following renewed independence, both countries aspired to reintegrate into the world economy, and the EU in particular. Further, both countries needed to move toward the Maastricht criteria as one of the preconditions for EU accession and euro adoption. In view of the war of independence and the ensuing even greater need for structural adjustment, Croatia decided not to fully forgo the exchange rate as an adjustment instrument and used interventions to build up official

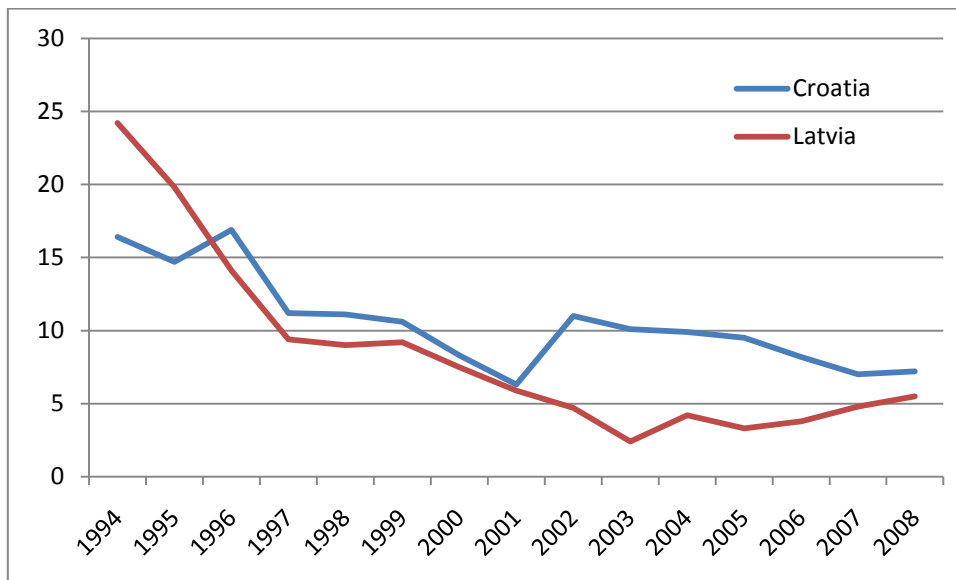
reserves.

Figure 11. Exchange rate against DEM/EUR 1995–2010 (100 = 2001)



Source: National Banks.

Figure 12. Interest spread 1994–2008 (%)



Source: World Bank, *World Development Indicators 2010*.

The difference in the timing of EU accession and the associated financial risks may also explain a good part of the difference in the interest spread between the two

countries.⁹ Between 1994 and 2000 the spread collapsed from around 25 percent in Latvia and 16 percent in Croatia to around 6 percent in both countries reflecting the decline in inflation (*Figure 12*) and the increasing efficiency of the banking sector that accompanied the acquisition of nearly all local banks by foreign banks. Notice that the interest spread diverged in the first half of the 2000s as Latvia geared up for EU accession in 2004 while Croatia fell behind. Thereafter, the interest spreads converged.

C. Economic Structure

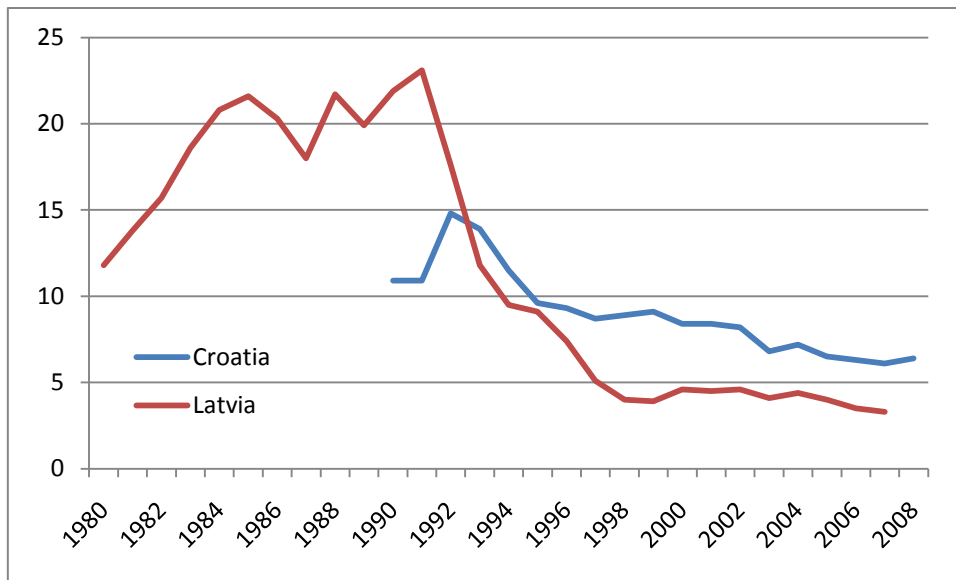
The dependence on agriculture as a source of income has declined rapidly in both countries. Both Croatia and Latvia managed to diminish the share of their agriculture in GDP down to slightly above (Croatia) or slightly below five percent (Latvia), which is only a little more than the EU average (*Figure 13*). This suggests strong efforts by the governments of both countries to modernize their economies by reducing farm support, for example, as well as, at least for Latvia, greater mobility of labor and other factors of production between industries. Accordingly, manufacturing and services maintained their competitive edge. Their share in manufactures exports remained around 70 percent in Croatia and 60 percent in Latvia (*Figure 14*). This matters because a strong manufacturing sector is ordinarily an important source of growth, partly because it is conducive to research and technological progress far beyond agriculture as well as to the buildup of human capital. Both countries' infrastructure is being modernized at a rapid pace. Electrical outages are rare: In 2005, electrical power was interrupted for about one day in both countries. In 2007, it took 16 days to start a business in Latvia against 22 days in Croatia.

The World Bank's Ease of Doing Business Index that ranks 183 countries by how conducive the regulatory environment is to business operation puts Latvia in 27th place, far ahead of Croatia in 103rd place (see <http://www.doingbusiness.org>). Croatia's low rank is surprising in view of the fact that the government of Croatia is

⁹ By the interest spread is meant the interest rate charged by banks on loans to prime customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits.

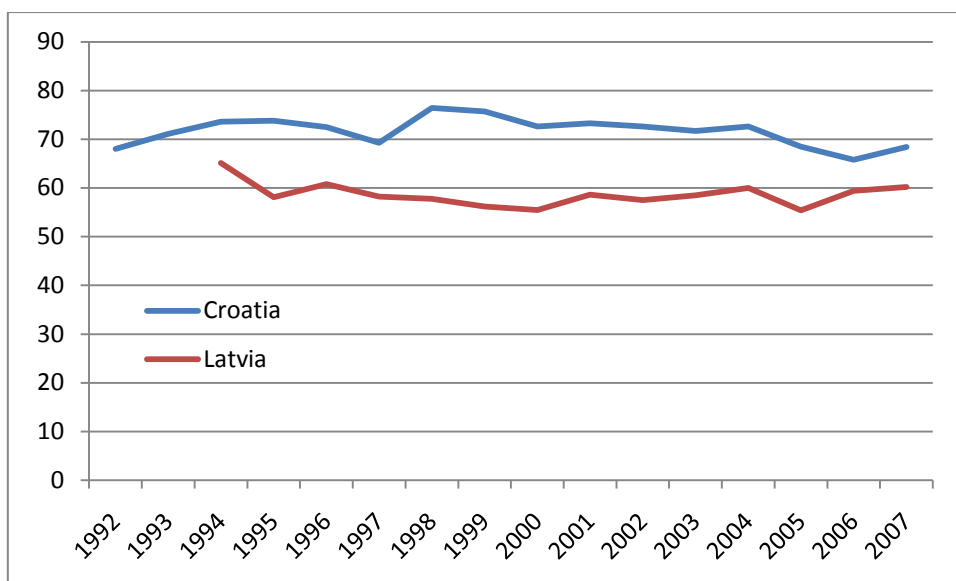
trying hard to prepare for EU accession. The low rank reflects, among other things, the ongoing difficulties entrepreneurs have in gaining construction permits (114th place) and processing the paper work for employing staff (163rd place). We return to this issue below.

Figure 13. Agriculture 1980-2007 (Value added as % of GDP)



Source: World Bank, *World Development Indicators 2009*.

Figure 14. Manufactures exports 1995-2007 (% of merchandise exports)



Source: World Bank, *World Development Indicators 2009*.

To recapitulate, economic growth requires capital to be accumulated and to be efficiently used: real capital, human capital, foreign capital, and financial capital, all of which we have covered thus far, and also social capital to which we now turn.

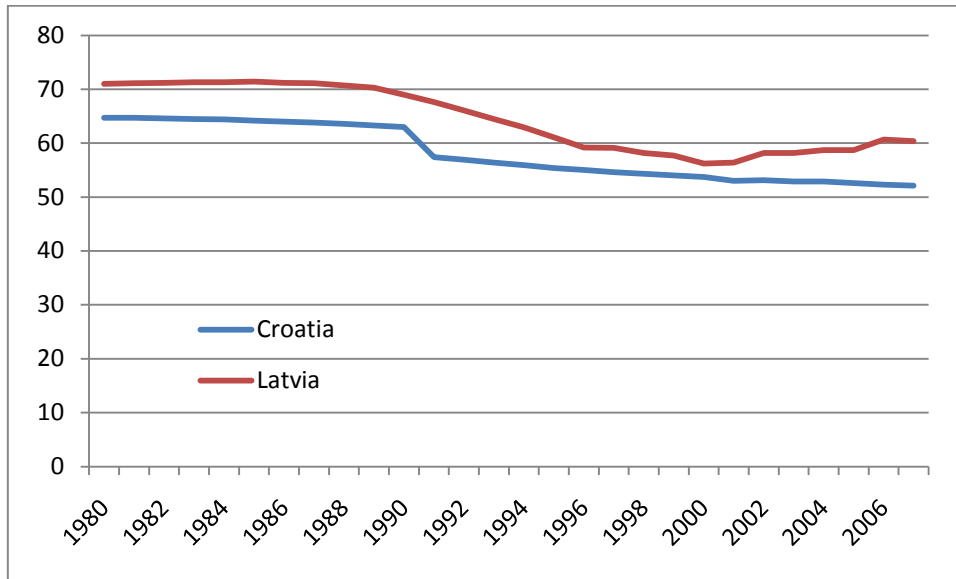
D. Labor Markets

Our model in Section 2 permits us to consider labor market institutions as an independent potential determinant of growth (see Forteza and Rama, 2006). The key is the distinction between labor and hours of work. More work increases output per person as in equation (12), but the need for a lot of work may also be a sign of inefficiency as in equation (13). By definition, as in equation (10), hours worked per person reflect labor force participation, hours of work per employee, and unemployment all of which, in turn, depend on prevailing labor market institutions, among other things. Rigid labor markets tend to be conducive to high wage costs and high unemployment.

Until 2000, labor force participation rates among 15-64 year olds declined in tandem in the two countries (*Figure 15*). Thereafter, Latvia's participation rate began to offset earlier losses. This reversal may be related to the structural reforms and rapid growth in anticipation of EU accession. Except for a sharp spike in 2005,¹⁰ *Figure 16* shows a dramatic decline in hours of work per week starting in 2000 in Latvia compared with a gradual decrease in hours of nonagricultural work in Croatia. All things considered, it is noteworthy that GDP per hour worked is higher in Latvia than in Croatia despite Croatia's per capita GDP being higher. Like many of their fellow EU members, Latvians have taken out their increased standard of living in less work as well as in higher incomes and consumption.

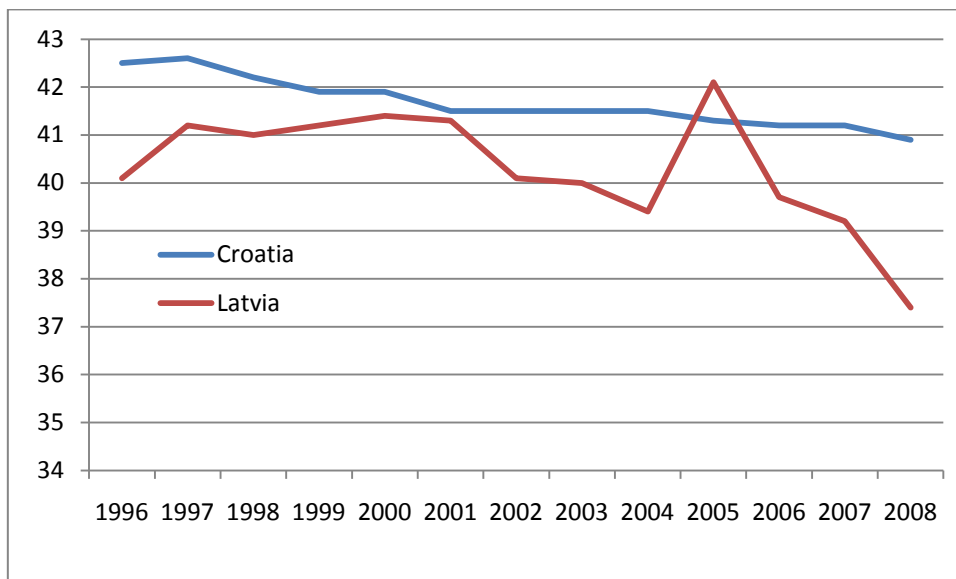
¹⁰ The reason for the spike in the Latvian data on hours of work in 2005 can be traced to the jump in hours that year in fishing, transport, storage and communications, and public administration and defense (see ILO: <http://laborsta.ilo.org/>).

Figure 15. Labor force participation rate 1980-2007
(% of total population ages 15+)



Source: World Bank, *World Development Indicators 2009*.

Figure 16. Hours of work per employee per week 1996-2008

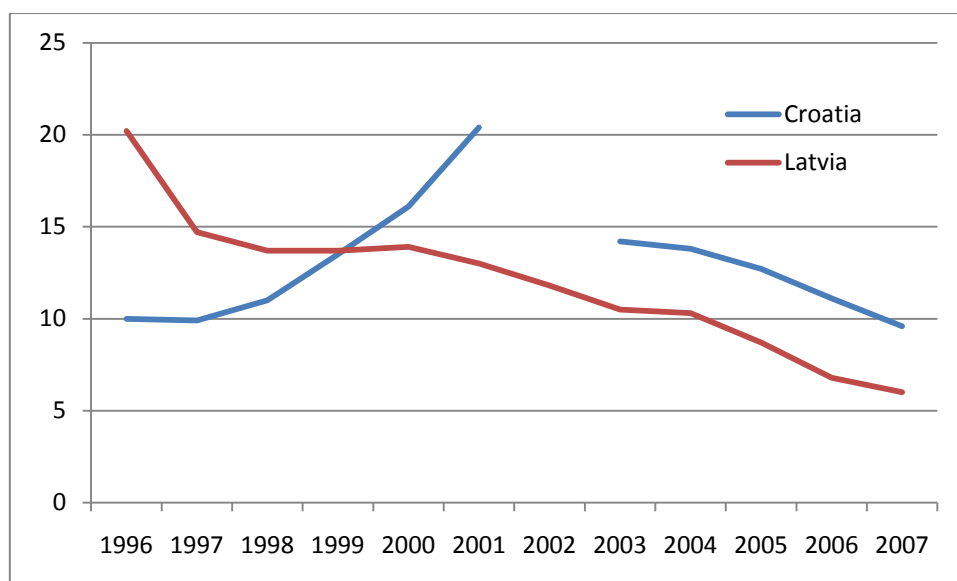


Source: International Labor Organization, www.ilo.org.

Unemployment developed as expected during the transition period (*Figure 17*). In Croatia, unemployment initially jumped as restructuring began in earnest after the end of the war of independence, substantially declining thereafter, but, also as a reflection

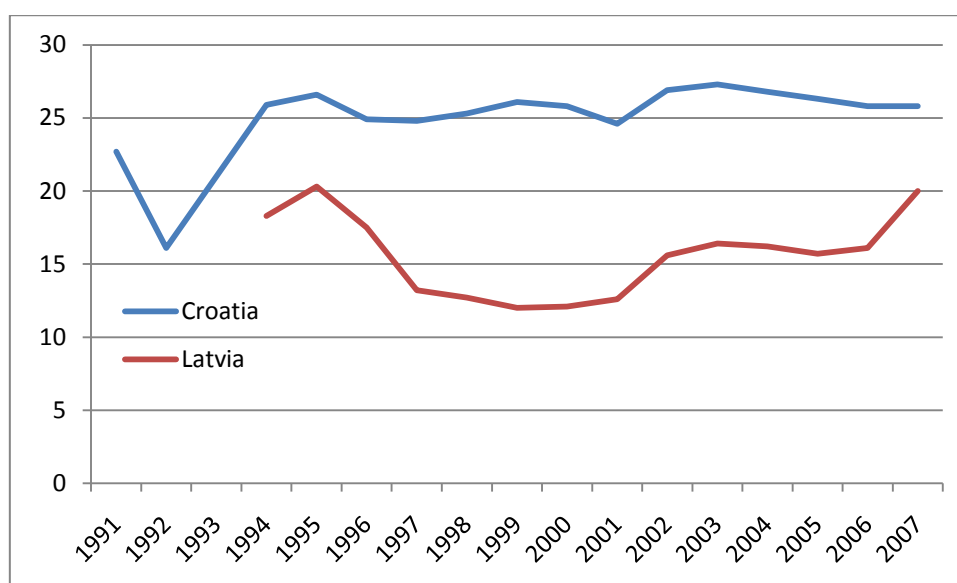
of the extended economic boom in Latvia (and substantial emigration of Latvian labor to Ireland and the United Kingdom), Croatia's unemployment rate remained significantly higher. Further, in contrast to Latvia's flexible labor market, the Croatian labor market is rather rigid, resulting in high wages and commensurably high unit labor costs (*Figure 18*).

Figure 17. Unemployment 1996-2007 (% of total labor force)



Source: World Bank, *World Development Indicators 2009*.

Figure 18. Compensation of employees 1996-2007 (% of expenses)

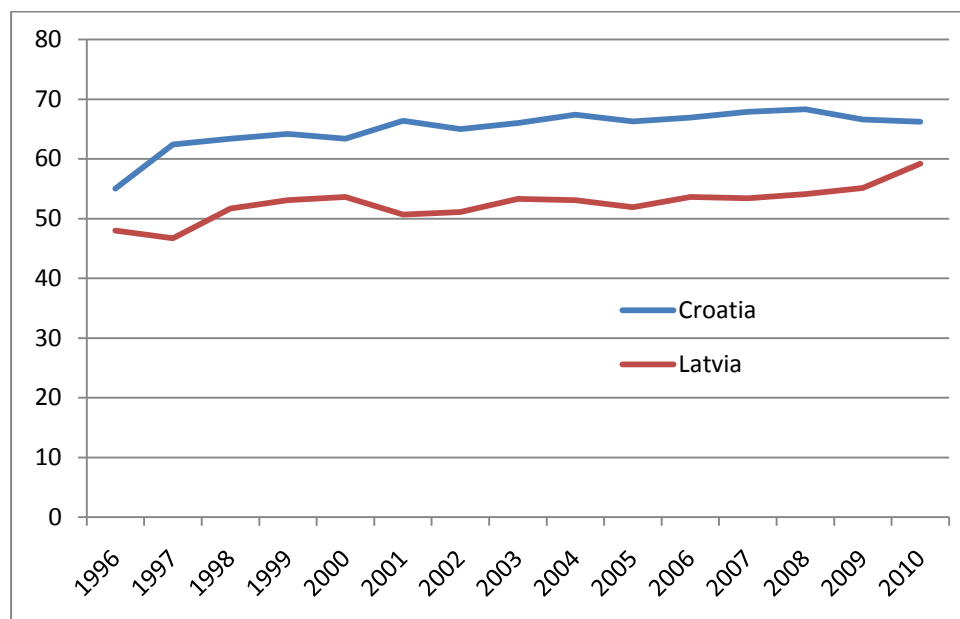


Source: World Bank, *World Development Indicators 2009*.

E. Aspects of Social Capital

Democracy goes along with economic freedom. Both are good for growth. *Figure 19* describes the gradual advance of economic freedoms in Croatia and Latvia since 1995; the scores shown are composites of individual scores for ten different aspects of freedom, including trade freedom, business freedom, investment freedom, and property rights. Interestingly, Latvia's economic freedom, overall, continues to lag behind Croatia despite Latvia's liberal economic policies, its presumed long adherence to the Copenhagen criteria of the EU11, and Croatia's legacy of the war of independence. In 2005, tax rates were cited as a major business constraint by 34 percent of managers surveyed in Croatia compared with 69 percent of managers in Latvia (*World Development Indicators* 2010).

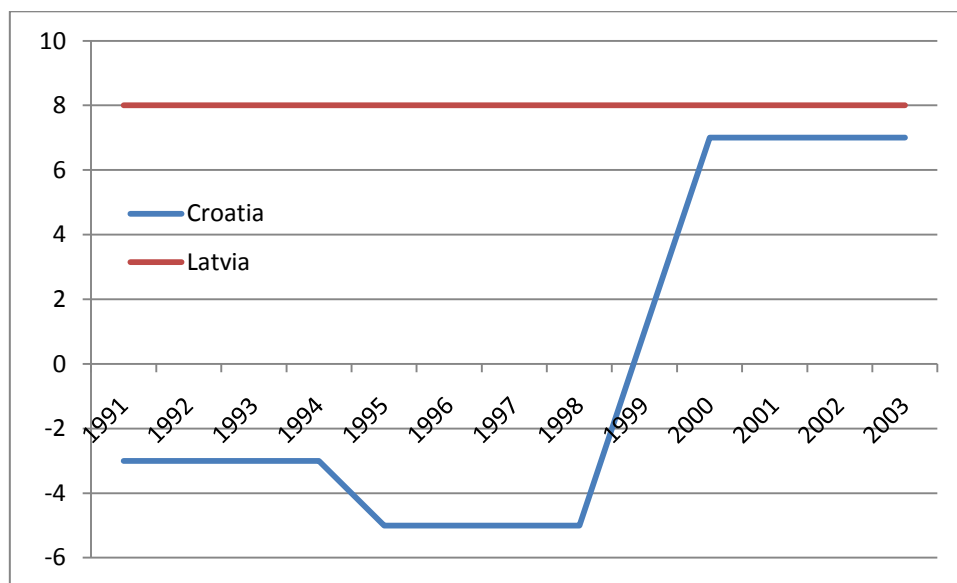
Figure 19. Economic freedom index 1996-2010



Source: Heritage Foundation, www.heritage.org/index/

¹¹ The Copenhagen Criteria were laid down at the 1993 European Council in Copenhagen. Their fulfillment is a prerequisite for EU accession. In particular, they stipulate that “Membership requires that the candidate country has achieved stability of institutions guaranteeing democracy, the rule of law, human rights, respect for and protection of minorities, the existence of a functioning market economy as well as the capacity to cope with competitive pressure and market forces within the Union. Membership presupposes the candidate's ability to take on the obligations of membership including adherence to the aims of political, economic and monetary union”. See http://www.europarl.europa.eu/enlargement/ec/pdf/cop_en.pdf.

Figure 20. Democracy 1991-2003 (Index from -10 to 10)



Source: Marshall and Jagers (2001).

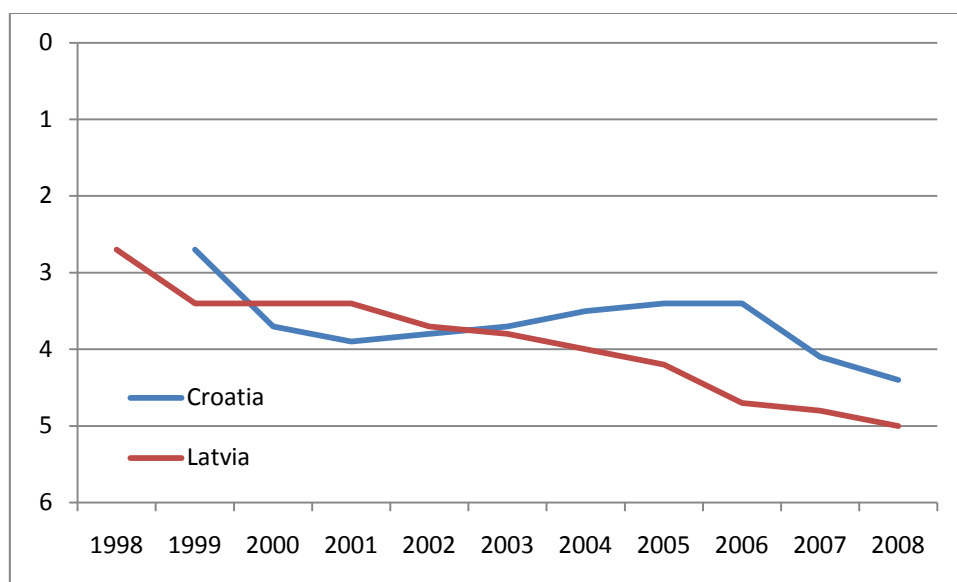
On a scale of democracy from minus ten to ten constructed by political scientists at the University of Maryland (Polity IV Project; see Marshall and Jagers, 2001), Latvia has consistently scored a high eight since reclaiming its independence in 1991 compared with Lithuania's perfect ten and Estonia's six, which reflects the situation of the Russian minority in Estonia. For comparison, Croatia, well until after the war of independence scored poorly within a range of minus one and minus three (*Figure 20*). Democracy, we think, is good for growth because, among many other things, it improves governance. Democratization can be viewed as an investment in social capital by which we mean the infrastructural glue that holds society together and keeps it working harmoniously and well. Social capital comprises several other ingredients, including trust, the absence of rampant corruption, and reasonable equality in the distribution of income and wealth (see Paldam and Svendsen, 2000). The idea here is that political oppression, corruption, and excessive inequalities tend to diminish social cohesion and thereby also the quantity or quality of social capital

According to the World Bank's Enterprise Surveys, about the same proportion of managers surveyed in 2005 said they lacked confidence in the court system to uphold property rights (27 percent in Croatia, 21 percent in Latvia). Even so, in Croatia ten percent of the managers surveyed described crime as a major business constraint

compared with a whopping 26 percent in Latvia. Further, according to Transparency International, both countries have made progress against corruption as measured by the corruption perceptions index, at least until the onset of the financial crisis (*Figure 21*). The World Bank reports a similar finding: in 2007, 19 percent of managers surveyed in Croatia described corruption as a major constraint on their business operations compared with 33 percent of managers in Latvia in 2009. Note that a few years earlier the ranking was the other way round: 27 percent of the managers in Croatia and 16 percent in Latvia found corruption to be a major business constraint. The sharp improvement should stimulate Croatian growth because corruption is not good for growth (Mauro, 1995; Bardhan, 1997). On the other hand, the sharp deterioration does not bode well for Latvia.

The distribution of income affects social cohesion and thus may have an influence on growth. While the Gini coefficients for the two countries suggest increased inequality in both of them since the final years of communism, inequality remains broadly in line with the rest of continental Europe, with inequality in 2004-5 in Latvia higher at 36 than in Croatia at 28.

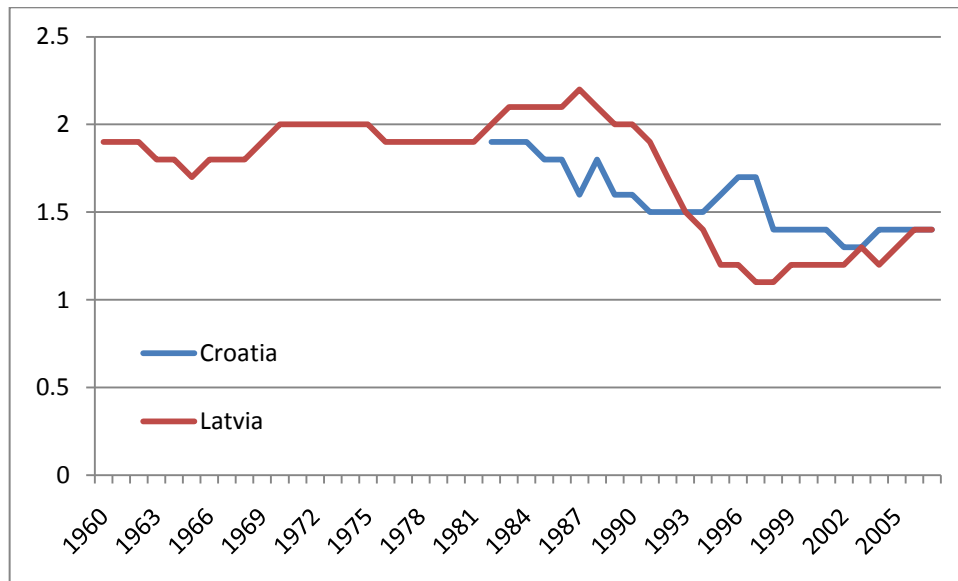
Figure 21. Corruption 1998-2009 (Index from 1 to 10)*



*Note: The higher the index number, the lower the level of corruption

Source: Transparency International, www.transparency.org.

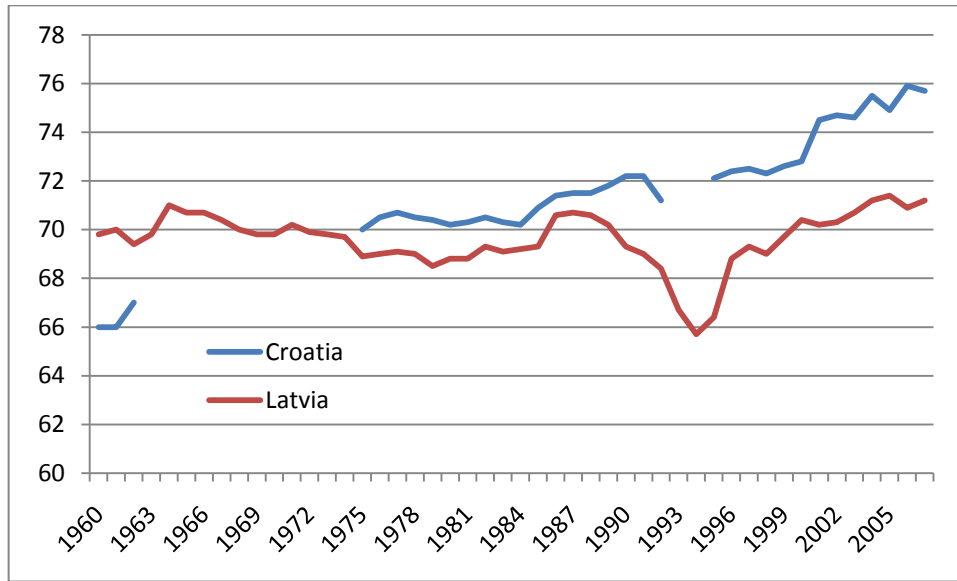
Figure 22. Fertility 1960-2007 (Births per woman)



Source: World Bank, *World Development Indicators 2010*.

Figure 22 shows that both countries have suffered a collapse in fertility as measured by the number of births per woman since the mid-1980s. The fertility rate in both countries recovered somewhat more recently but remains well below the reproduction rate. The population of both countries continues to decline. Even if excessive fertility holds back economic growth in many developing countries, population decline is not likely to increase per capita growth in Croatia and Latvia, on the contrary. In contrast to Croatia, life expectancy at birth took a dive in Latvia in 1985-95, and only in the mid-2000s surpassed the long-term average of the 1960s-1980s while still remaining about five years below that of Croatia (*Figure 23*). In the 2000s, public and private health expenditures in Croatia have exceeded those in Latvia. Still, Latvia could offer more hospital beds per 1000 inhabitants (7.5) in 2001 than Croatia (5.3). Even so, child mortality in Latvia, at 8.6 percent, was significantly higher than Croatia's 5.8 percent. Public health and fertility are closely related to human capital accumulation and hence important to economic growth over time.

Figure 23. Life expectancy at birth 1960-2007 (Years)



Source: World Bank, *World Development Indicators 2010*.

F. Accounting for the Income Differential

We now return to equation (12). We know the extent of the income differential that we want to understand. In 2008, Croatia's per capita GDP was 1.1 times larger than that of Latvia (recall *Figure 1*). We have reported the average investment rates we need for the second term under the square root in equation (12), 0.27 in Latvia and 0.21 in Croatia.

Next, we need to count years of schooling. To this end, we could use existing measures of school life expectancy, defined by UNESCO as the total number of years of schooling which a child can expect to receive, assuming that the probability of his or her being enrolled in school at any particular future age is equal to the current enrolment ratio at that age. According to UNESCO, school life expectancy in 2008 was fifteen years in Latvia and fourteen in Croatia. We prefer to reassess the UNESCO measures of school life expectancy to cover the longest period for which fairly continuous data are available, i.e., 1999-2007, rather than just the final year. We do this by adding the number of years of primary, secondary, and tertiary education (nine, three, and five in Latvia and eight, four, and five in Croatia)¹², weighted by

¹² Note that Latvia introduced obligatory preschool of two years in 2002. Nonetheless, we continue to use the primary school data excluding the two preschool years. The Croatian

average enrollment rates over the period. For Latvia, the imputed years of schooling are $9 \cdot 0.93 + 3 \cdot 0.94 + 5 \cdot 0.67 = 14.5$ and for Croatia, $8 \cdot 0.88 + 4 \cdot 0.88 + 5 \cdot 0.38 = 12.5$.¹³ This is the information we need to assess the first term under the square root in equation (12).

At last, we need to quantify the third and last term under the square root in equation (12), hours of work per person, $q = Q/L$, defined in equation (10) as a multiple of the labor force participation rate, hours of work per employed person, and one less the unemployment rate. Using averages from *Figure 15* (1991-2007), *Figure 16* (1996-2007), and *Figure 17* (1996-2007), we get $0.543 \cdot 41.7 \cdot (1 - 0.129) = 19.72$ for Croatia and $0.602 \cdot 40.3 \cdot (1 - 0.119) = 21.37$ for Latvia.

Now that we have the numbers we need, let us plug them into equation (12) and solve for the implicit efficiency differential as a residual:

$$(14) \quad \frac{A_C}{A_L} = \left(\frac{y_C}{y_L}\right)^{\frac{2}{3}} (e^{u_L - u_C})^{\frac{1}{3}} \left(\frac{s_L}{s_C}\right)^{\frac{1}{3}} \left(\frac{q_L}{q_C}\right)^{\frac{1}{3}} = 1.10^{\frac{2}{3}} (e^{14.5 - 12.5})^{\frac{1}{3}} \left(\frac{0.272}{0.213}\right)^{\frac{1}{3}} \left(\frac{21.37}{19.72}\right)^{\frac{1}{3}}$$

$$= 1.066 \cdot 1.948 \cdot 1.085 \cdot 1.027 = 2.314$$

To complete the computation, we substitute this solution for the efficiency differential back into equation (12):

$$(15) \quad \frac{y_C}{y_L} = \left(\frac{A_C}{A_L}\right)^{1.5} \sqrt{e^{u_C - u_L} \left(\frac{s_C}{s_L}\right) \left(\frac{q_C}{q_L}\right)} = 2.314^{1.5} \sqrt{e^{12.5 - 14.5}} \sqrt{\frac{0.213}{0.272}} \sqrt{\frac{19.72}{21.37}}$$

$$= 3.520 \cdot 0.368 \cdot 0.885 \cdot 0.961 = 1.10$$

This back-of-the-envelope decomposition suggests that if the two-year difference in education measured by years of schooling were the sole difference between the two countries, education could by itself account for a 172 percent (i.e., $1/0.368 - 1$)

education system adopted the Bologna system for higher education in 2005, i.e., a three-year bachelor and a two-year master. Prior to 2005 four years were needed to complete the first university degree (diploma). Sources: Ministry of Education and Science of the Republic of Latvia and Ministry of Science, Education and Sports of the Republic of Croatia.

¹³ The primary school-enrolment rates are net, and refer to the ratio of children of official school age who are enrolled in school to the population of the corresponding official school age. The secondary and tertiary rates are gross, and refer to the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education in question. Source: *World Development Indicators* 2010.

difference in per-capita-output difference between Latvia and Croatia, in Latvia's favor. Hence, education has a powerful influence on economic outcomes in this computation. By themselves, different investment rates suffice to explain no more than a 13 percent income differential (i.e., $1/0.885 - 1$). By the same token, the labor market variables would suffice to account for only a four percent income differential (i.e., $1/0.961 - 1$). The labor market variables weigh Croatia down, but to a small extent. On the other hand, fewer hours per person in Croatia than in Latvia may be viewed as a sign of Croatian efficiency, but the difference is small. The main point is that, in our simple model, education makes a much larger contribution to the income differential than investment – or labor market institutions, for that matter.

As shown in equation (14), this arithmetic leaves a 131 percent efficiency difference between Croatia and Latvia as a residual explanation for the fact that we set out with, namely, that there was in 2008 a ten percent per-capita-output differential in equation (14), in Croatia's favor, despite Latvia's significant advantage on the education front. Presumably, Croatia's efficiency advantage vis-à-vis Latvia benefits from less inflation (*Figures 9 and 10*), more manufacturing exports (*Figure 14*), more economic freedom (*Figure 15*), and longer lives (*Figure 23*), as we have discussed.

To sum up, our computation suggests that education matters a good deal more than investment or labor market arrangements for explaining the growth differential between Latvia and Croatia from 1991 to 2008 while some advantages in efficiency must be the reason why Croatia has managed to stay ahead. A decomposition of the efficiency differential between the two countries is beyond the scope of this paper. Suffice it to say that intensive growth is what counts.

Before concluding, we must acknowledge the possibility that Latvia's rapid growth after 2000 was driven by excessive optimism fueled by unsustainable fiscal and monetary policies and was, therefore, bound to be reversed as happened when the financial crisis struck in 2008. The comparison of Croatia's actual economic trajectory and Latvia's road not taken with a less rapid rise and fall could no doubt result in a different decomposition of the income differential between the two countries than the one that we have presented.

Table 1 summarizes our findings by listing the average values of the four sets of determinants of the income differential in equation (15) as well as the international

dollar values of per capita GDP in 2008 in the last column.

Table 1. Parameter values in equation (15)

	Investment (% of GDP)	School life expectancy (Years)	Hours of work per person per week	Efficiency (Croatia = 100)	Per capita GDP 2008 (Dollars at ppp)
Latvia	27	14.5	21.4	231	17,220
Croatia	21	12.5	19.7	100	15,590

4. Conclusion

Our comparison of the development trajectories of Croatia and Latvia since 1991 suggests policy implications that seem to be of general relevance for many countries, but particularly for those that aspire to rapid economic growth to catch up with others. In brief, rapid growth requires

- (i) Public policies that foster education and training, free trade, and domestic as well as foreign investment in a business-friendly environment.
- (ii) Monetary and fiscal policies that support price stability and sound private banking and other financial intermediation, sustainable government budget positions, and international, consumer-friendly competition.
- (iii) Sound and transparent societal institutions that support the rule of law.
- (iv) Good governance in both the public sector and the private sector.

Further, in countries such as those under review, the prospect of EU membership may create favorable conditions for sound economic policies, rapid structural change, and institution building. Such an EU perspective may also help to forge a broad-based political consensus on the policy actions required for change.

In the 2000s until the financial crisis hit the two countries in 2008, Latvia grew nearly twice as rapidly as Croatia (around nine percent per year compared with close to five percent on average). As a consequence, Latvia nearly caught up with Croatia in terms of per capita GDP (recall *Figure 2*). As far as Latvia's rapid growth is concerned, it was driven by domestic demand (net exports were a major drag on

growth¹⁴), fed by rapid credit expansion fueled by capital imports. Bakker and Gulde (2010) suggest that countries with rapid credit growth and a boom in domestic demand face massive current account deficits, and suffer mounting external debt and soaring inflation. Latvia, in particular, was strongly affected, experiencing one of the strongest capital inflows among the new EU members. Disaster struck in 2008 when it became clear that the country's growth rate and its composition were no longer sustainable. Croatia's growth was less rapid and better balanced, credit expansion was more muted, and inflation was accordingly lower. It appears that a more cautious policy and, in a certain way, some rigidities in the banking system may be good for economic stability.

What can account for the different growth performances? Returning to our classification of the sources of growth based on the aggregate production function presented in Section 2, we can summarize our main findings as follows:

First, Latvia has invested more relative to GDP than Croatia, thereby fostering long-term growth. Net FDI, marginally higher in Latvia, could have also contributed.

Second, Latvia has invested more in education at all levels, thereby increasing the human capital stock. The buildup of human capital in Latvia relative to Croatia manifests itself in two extra years of schooling, and is reinforced by more intensive use of personal computers and of the internet. Both support rapid human capital accumulation.

Third, Latvia started earlier and more aggressively – even if it did so later and less intensely than Estonia – to raise economic efficiency, that is, total factor productivity, and thereby lay a basis for rapid long-run growth. These efforts started around the middle of the 1990s after the initial output decline had been reversed and hyperinflation had been brought down.¹⁵ These efforts were, in particular, driven by Latvia's EU integration process.¹⁶ To prepare for EU membership, Latvia liberalized trade, restructured the economy, *inter alia* by a broad privatization of state assets, and

¹⁴ Both countries' exposure to the world economy (in particular, the EU) was nearly equal at around 43 percent of goods and services

¹⁵ For Latvia an important caveat is appropriate. It is not clear how much of the TFP growth was sustainable since disproportionate activity went into the non-tradable sector such as real estate and contraction. We are grateful to David Moore for pointing this out.

¹⁶ The official accession process for the ten former communist countries in Europe was formally launched at the end of March 1998.

built market-friendly institutions to EU specifications. By the time of EU accession, Latvia, along with the other Baltic countries, had built up a flexible market economy and was catching up.

While Croatia moved more cautiously, it still suffers from rigidities, especially in the labor market, and consequently high unit labor costs. Corruption, despite improvements, remains a significant problem. Still, in view the main determinants of growth, Croatia scores higher in terms of economic efficiency than Latvia. Moreover, the higher share of manufacturing and higher importance of services exports, dominated by tourism, an industry with good development potential, push Croatia's economic efficiency hard. Croatians also enjoy more economic freedom and longer lives. At last, EU accession, now expected in 2012 or 2013, should provide another confidence boost, lifting investment, exports, consumption, and growth. So far, on balance, Latvia caught up, but Croatia remains ahead.

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