IMPACT OF FOREIGN DIRECT INVESTMENT ON CROATIAN MANUFACTURING EXPORTS

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Abstract

The exports of Croatian manufacturing industry have been stagnating over the last decade or so. Over the same period there have been relatively high inflows of foreign direct investment (FDI) into industry. The aim of this paper is to examine, after controlling for other potentially significant variables, whether these inflows have had an impact on export performance. Using the panel data approach for 21 manufacturing industry sectors over the period between 1996 and 2002, it is found that FDI has positively and significantly affected exports, but the extent of this impact was relatively low. This implies that there is a potential for improving the export performance of Croatian manufacturing industry by attracting more FDI into this sector. Policy makers should try to enhance the potential positive effects of FDI by targeting specific export-oriented greenfield foreign investment, and, in addition, implement measures to increase potential spillover effects.

JEL Classification: H25

Key words: *foreign direct investment, exports, models with panel data, Croatia*

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1. INTRODUCTION

Since the successful implementation of the stabilization program in 1993, Croatia has enjoyed the benefits of price and exchange rate stability. It was expected that, in such an environment, enterprises would be able to restructure over the medium term and that they would be able successfully to compete in increasingly open domestic, as well as in export, markets. However, Croatian manufacturing industry did not manage the necessary restructuring well, which has been reflected, among other things, in weak development of manufacturing exports over the last decade (Nikić, 2003). There have been several reasons for stagnating exports over this period, like for example the loss of important export markets in some other former republics of Yugoslavia, war conditions in Croatia and in the wider region, slow and inefficient privatization, low investment levels, too slow integration in the European and world economy, or low export competitiveness. As a consequence, the exports of goods from Croatia to the 12 EU countries, which amounted to 0.34% of all EU imports in 1993, fell to 0.19% in 2000. Over the same period, the corresponding percentage for the group of Central and Eastern European countries doubled (Galinec and Jurlin, 2003).

Since it is accepted that higher exports can contribute to accelerating economic development (”export-led growth” strategy), promoting exports has become one of the most important tasks of Croatian economic policy. In the case of Croatia, the high trade deficits on the current account of the balance of payments over the last decade underline the priority that should be assigned to export promotion (Stučka, 2004). Several different policy measures can be applied for the accomplishment of this goal. Many domestic economists argue that the problem primarily arose because of an excessively stringent exchange rate policy and an overvalued exchange rate over the period since the implementation of the stabilization program, and thus propose currency depreciation as a necessary policy measure (Nikić, 2003). On the other hand, some argue that wages rose too fast relative to productivity increases, making the industrial production in Croatia too expensive and thus endangering export competitiveness. Another problem contributing to the relatively low competitiveness of manufacturing industry is a lack of modern technology (and possibly of capacity) in production, due to the comparatively low investment rates during the war period and the years thereafter (Galinec and Jurlin, 2003).

Recent literature and the experience of some other countries indicate that there may be export-promoting effects from inward foreign direct investment (FDI). But although Croatia has been relatively successful in attracting foreign investors, as measured in cumulative FDI stock per capita, the stagnating exports over the same period imply that, at the first glance, this has played no role in promoting exports. However, more detailed analysis of this relationship is needed, to account for the effects of other potentially important variables before any such conclusion is drawn.

The first aim of this paper is to investigate the determinants of the weak export development over the observed period. Among other macroeconomic variables, special attention is given to the role of the increasing FDI stock in Croatian manufacturing industry. Some policy measures will be given, which should contribute to building and/or strengthening the link between FDI and exports in future.

The structure of the paper is as follows: First, some developments in the Croatian economy relevant for exports and competitiveness are shortly described. Afterwards, the theory of as well as some empirical evidence concerning the link between inward FDI and exports is briefly reviewed. The fifth section then gives a descriptive representation of the relevant data and states the econometric model that will be tested. The results from the estimations are presented and discussed in the sixth section and the last part gives conclusions and policy recommendations.

2. SOME IMPORTANT DEVELOPMENTS IN THE CROATIAN ECONOMY SINCE THE STABILIZATION PROGRAM

It is widely accepted among policy makers (although there still remains some degree of disagreement among academic economists) that exports can help in accelerating economic growth. Gains are expected in the form, for example, of increased employment, income and efficiency, increased foreign exchange earnings and economies of scale (UNCTAD, 2002). This and the high trade deficits on the current account of the Croatian balance of payments over the last decade are the main reasons why export promotion has become one of the most important economic policy issues in Croatia. In order to better understand the causes of weak export developments in Croatia, some studies on this topic are shortly reviewed.

According to Nikić (2003), probably the most important reason for stagnating manufacturing industry exports has been the overvalued exchange rate. He sees the seeds of overvaluation in the stabilization program from 1993. Although the Croatian currency was devalued by 20% in October that year, according to Nikić (2003), the resulting increase in prices was more than proportional, which led to a 50% overvaluation of the domestic currency. In the following months, the exchange rate started to depreciate, but insufficiently to compensate for the preceding rise. As an overall result, inflation has been eliminated successfully, but at the cost of an overvalued exchange rate which, according to Nikić (2003), has been too strong a burden for industry, which has been prevented from successfully restructuring and cutting the costs of production.

At the end of 1995 there was a strong increase in wages and public expenditures, which led to further a deterioration in exporters' competitiveness. Nikić (2003) concludes that at around this time, domestic production was partly substituted for by imported goods. In addition, he identifies other problems which slowed down the restructuring of enterprises and were more of an institutional and legal nature, such as the lack of transparency in privatization process and the slow adjustment of the legal framework.

Also, productivity increases in industry, which mostly arose through a reduction of the number of employees, were offset to a great extent by the high increases in wages and public expenditures financed by higher tax burdens. At the same time, the levels of domestic investment and inflows of foreign capital remained relatively low. So, according to Nikić (2003) although the GDP growth rates from 1995 to 1997 were rather high, with a slowdown over the next two years and a new increase in 2000, this development was mostly due to increased domestic consumption.

Further problems were created for enterprises when the value added tax was introduced in 1998, additionally increasing the total tax burden (Nikić, 2003). This was followed by further increases of public spending, which rose faster than public revenues, causing the public sector to accumulate debts to the private sector (mostly to suppliers) and leading to general lack of liquidity in the economy (in the sector of enterprises). This raised the interest rates, and thus financing costs for firms. The situation improved somewhat in 2000 as more discipline was introduced into public spending.

Over the whole period, the trade deficit was high, due to stagnating exports and expanding domestic consumption contributing to higher imports. This was favored by the overvalued exchange rate, making imports relatively cheap. Such developments led to a fast expansion of foreign debt over the last few years, which could potentially endanger the macroeconomic stability of the Croatian economy, attaching an even higher priority to the export promotion among economic policy tasks. Although the trade deficit is partly covered by the surplus in trade in services (mostly the tourist trade income) and workers' remittances, the current account as a whole has registered deficits throughout the last decade reaching a peak of 12.5% of GDP in 1997 (Stučka, 2004).

Even if the net tourism income completely covered the visible trade deficit, it creates mostly seasonal employment and is also very sensitive to reversals in "tourism fashion" and security crises, and thus, cannot replace all of the potential benefits of stronger export performance (Stučka, 2004).

Nikić (2003) argues that depreciation is needed in order to change these developments[1]. However, Babić (2002) shows, using time series analysis, that the exchange rate is a weak explanatory variable of Croatian exports. In addition, Stučka (2004) estimates that a 1% permanent devaluation results in an improvement of the trade balance of 1.34% at best. These rather limited potential benefits have to be compared to several possible adverse effects. The first one, emphasized by both Nikić (2003) and Stučka (2004), is the potential instability through depreciation via an inflationary spiral, which can also offset all the benefits of depreciation for exporters. In addition, both authors also recognize that the Croatian economy is strongly characterized by currency substitution ("*euroization*"). This has led to a high level of indexed debt (initially to the German mark, then to the Euro) held by households and enterprises (Stučka, 2004), meaning that a depreciation would have strong redistribution effects (from debtors to creditors) and is politically questionable as a means of achieving economic policy goals. In the more extreme scenario, it could also lead to instability of the financial system if many debtors become unable to pay back their loans. Other adverse effects of a currency devaluation mentioned by Stučka (2004) include a fall in real domestic income due to the increase in import prices; potential sensitiveness of industries to increases in import prices of intermediate goods; a shift of resources to the tradable sector, possibly causing a wage gap and resulting in higher unemployment; and adverse impact on public finances through the increased domestic currency cost of debt servicing.

All of the above arguments lead to the conclusion that currency devaluation can hardly induce the desired export-promoting and trade balance-improving effects, at least not to the extent required, and not without causing other serious problems. Another instrument which cannot be implemented in order to improve the present situation is administrative import barriers, which are unacceptable due to international agreements

[1] Stučka (2004) calls currency depreciation "an external approach" to improving a country's competitiveness, as opposed to "an internal approach", in which policy makers try to influence e.g. labor productivity, costs of production, taxes etc.

in force and the Croatian commitment to stronger integration in the European and world economies. All other export-promoting measures, broadly speaking, should improve the productivity of the enterprises and lower the costs of production.

One of the most important reasons for the weak export development was the slow integration of the Croatian economy into the European and the world economy, i.e. a comparatively low degree of trade liberalization. Croatia joined the WTO only at the end of 2000, and until the end of 2001, Croatia had free trade agreements only with Bosnia and Herzegovina, Slovenia and FYR Macedonia (Galinec and Jurlin, 2003). This is an important obstacle for strong export performance. Studies surveyed by Galinec and Jurlin (2003) estimate that, for example, the status of EU accession candidate country brought an increase in exports between 30% and 90% to some Central and Eastern European countries. However, Galinec and Jurlin (2003) also emphasize that stronger integration does not automatically bring about higher exports, as shown by the example of Bulgaria, while, for example, China, at the same time, managed substantially to increase its exports to EU. They stress the importance of export competitiveness, in which they give special attention to wages and productivity and unit labor costs. They argue that the role of exchange rate changes, unit labor cost changes, as well as wage levels (in international comparisons) was not that important in determining export performance in Croatia between 1995 and 2001. This finding is supported by conclusions from Švigir (2004), who analyzes the export performance of groups of different manufacturing industries and the average productivity and wage developments within these groups. However, both of these studies, as well as the conclusions from Nikić (2003), are based on more or less simple observations of simple correlation coefficients. Needless to say, more rigorous econometric investigation is needed in order to assess the determinants of Croatian exports.

Except for the potential export determinants mentioned above, there is another potentially important variable which has not yet been analyzed at all in this context for Croatia. It is widely accepted that inward foreign direct investment may influence a host country's export performance. Croatia has been relatively successful in attracting foreign investors at the overall level, as measured by the percentage of inward FDI stock in the gross domestic product over the last decade, but especially since a greater degree of political stability was established. This percentage amounted to 28.4% in 2002, while the average for the whole region of Central and Eastern Europe was 20.8% in the given year (UNCTAD, 2003). As for the sectoral composition of inward FDI stock in Croatia, around 36.1% was concentrated in the manufacturing industry (data for 2001, only equity capital, source: WIIW, 2003). This is only slightly below the corresponding values for advanced transition countries, new EU member states, ranging from 36.2% in Slovenia to 43.8% in Slovakia (source: WIIW, 2003). On the other hand, the great majority of the FDI inflows to Croatia were through acquisition of existing companies (mostly through privatization), while greenfield investment amounted to only 16.6%, and was mostly concentrated in the sector of services (Škudar, 2004). Greenfield investments in the manufacturing sector were relatively evenly distributed among sectors, but there were very few export-oriented projects (Škudar, 2004). Considering that exports have been stagnating over the same period, one might conclude at first glance that FDI did not play any export-promoting role. Again, more careful econometric examination of this potential link is needed in order to account for the influences of other important variables. Before the data are examined and the econometric model is presented, the relevant theory about FDI and trade is briefly reviewed in the next section.

3. THEORY ON FOREIGN DIRECT INVESTMENT AND EXPORTS

3.1 Standard theory of international trade

One of the important questions posed by international trade theory is whether the international factor movements and international trade in goods are substitutes or complements.

In a standard Heckscher-Ohlin-Samuelson model (H-O-S), the factor prices will equalize even if there is only trade in goods and there are no factor movements at all. This result is known as the factor price equalization theorem. In a way, countries would be trading the factors of production indirectly – embodied in the traded goods. In this case trade and factor movements are obviously substitutes. This would also be true if only factors were mobile, and if there were no trade in goods. Then there would still be a tendency for equalization of the commodity prices. The reason for this is that in the H-O-S model, trade arises because of the differences in factor endowments between the countries. Subsequent research has shown that if additional assumptions are included into the standard models, it is possible for factor movements and international trade to become complements. Different ways of achieving this result include allowing for differences in technologies and preferences across countries, introducing production taxes, a monopoly market structure and external economies of scale (see Goldberg and Klein, 2000 for an overview of relevant research). The reason is that in these cases differences in factor endowments are not the cause of trade, or at least not the only cause.

3.2 Theory of multinational enterprises

The central idea of the theory of multinational enterprises (MNE) is that firms must have certain advantages in order to become multinational companies. It is reasonable to expect that firms can do business in foreign countries only at a higher cost than domestic firms. Without specific advantages capable of compensating for this inferior position, their foreign operations would not be sustainable. In his OLI paradigm Dunning (1993) organized these advantages into three basic groups. In his opinion the multinational firm must have a product or a production process giving it some monopoly power in the foreign market (ownership advantage - O), and/or a reason to locate production abroad (location advantage - L), and/or an incentive to exploit its ownership advantage internally (internalization advantage - I). A direct conclusion is that firms may have different motives for becoming multinational enterprises. These motives may define different types of foreign direct investment, which on the other hand, may have different impact on the home and (more interesting for this research) host country's economy and thus export performance.

The impact of the various types of FDI on a host country’s exports as suggested by the OLI paradigm is summarized in Table 1. It is difficult, if not impossible, to predict the macroeconomic effect of FDI on exports, unless one knows that most foreign investment is either market- or resource-seeking. But even if one knew that most of the FDI in some host economy were e.g. market-seeking, there still might be some positive effects of FDI on exports through different channels of indirect influence (which are described in the next section).

In the beginning of the 1980s the first steps were taken to incorporate the concept of the multinational enterprise into the standard theory of international trade (see Helpman and Krugman, 1985; Markusen,

2002). Over the last few years, there have been substantial advances in this part of international trade literature and some additional aspects of the theory of multinational enterprise have been included and formalized. In these recent models, the results on the relationship between factor i.e. capital movements (FDI) and trade depend on whether the multinational firms are horizontally (the MNE produces the same product in multiple plants located in more than one country) or vertically integrated (separate segments of the production process are carried out in different countries). The type of integration is determined by factors such as transport costs or firm- and plant-level economies of scale. The results can be summarized as follows (Markusen, 2002): Horizontally integrated firms often arise because of trade barriers in the form of tariffs ("tariff-jumping investment"), or high transport costs. The firm basically faces the dilemma of either producing abroad or exporting. Such foreign investments and trade are obviously substitutes. FDI is favored relative to exports if the foreign market is large, transport and tariff costs are high, firm-level economies of scale are large compared to plant-level economies of scale, if the countries are similar in size and relative endowments and as the world income grows. Things are different in the analysis of vertically integrated MNEs, which includes trade in intermediary products. The production process is likely to be geographically fragmented if the countries have factor-price differences and the stages of production have different factor intensities. Since segments of the production process occur in different countries, intermediate products need to be traded, with the consequence that this kind of investment is likely to be encouraged by lower trade costs. Markusen (2002) shows that for this kind of FDI, resulting in a vertically integrated firm, the substitutability between FDI and trade is more likely if the host country is small and differences in endowments are relatively large.

Table 1: Expected trade effects from different types of FDI from the host country perspective.[a]

Motive	Trade effects	
	Imports	Exports
market-seeking	increasing	none
resource-seeking	none	increasing
strategic asset-seeking	ambiguous	ambiguous

[a] *Resource-seeking investments include both natural resource- and labor-seeking investments, while strategic asset-seeking investments involve the acquisition of local firms.*

Source: Jensen (2002: 208, modified).

There is another specific type of model of multinational enterprise, which incorporates some features that can motivate both horizontally and vertically integrated multinational firms (Markusen, 2002). The defining assumptions of this "knowledge-capital model" are that there are knowledge-based assets (headquarters), which are skilled labor-intensive and may be geographically separated from production, possibly motivating vertical integration. The services of knowledge-based assets are (at least partly) joint inputs into multiple production facilities – a property that gives rise to horizontal multinationals. In such a model, trade and investment are complements, in the sense that liberalizing capital movements may increase the volume of trade, if the differences in countries' relative endowments and sizes are large. On the other hand, if the countries are similar and trade costs are not low, FDI and trade are substitutes.

3.3 Possible channels of indirect influence

The impact of FDI on host country exports is not only direct, through the exports of the foreign affiliates. There are very important side-effects of foreign production, which may influence the export performance of

domestic producers indirectly. In this section, some commonly mentioned channels will shortly be described without reference to empirical evidence.

Firstly and naturally, MNEs can help increase exports simply because FDI provide additional capital to the host economy. This may lead to changes in factor proportions and may increase labor productivity. The provision of capital through MNEs can especially be important in countries where domestic investment is limited by financial constraints, for example in improving developing country exports of raw materials and labor-intensive products (UNCTAD, 2002).

There may also be very important spillover effects from MNE activities. As mentioned above, companies need to have some competitive assets, which are often firm-specific, in order to become MNEs (ownership advantages). It is especially difficult for local producers in less developed economies to acquire such assets and capabilities by themselves. But a transfer of these assets to foreign affiliates in the host economies by MNEs "through training, skills development and knowledge transfers opens up prospects for further dissemination to other enterprises and the economy at large" (UNCTAD, 2002:152). This upgrading of technical and managerial skills provided by the multinationals may spill over to domestic producers (for example, through the mobility of trained human resources), enhancing their productivity and helping them to improve their competitiveness on the export markets. Under the assumption that the foreign affiliates produce more efficiently (which is mostly the case in less developed countries, see UNCTAD, 2002), locally owned firms might increase their efficiency by copying the operations of the foreign producers or may be forced to do so by the foreign competition (Lipsey, 2002). These are the horizontal linkages inside the MNE's industry, but demonstration effects may arise also in unrelated firms and sectors. An especially important channel for productivity spillovers into industries different from the one in which foreign investor operates is constituted by the backward linkages to suppliers. Such productivity spillovers may occur because of intensified competition among local companies to become MNE suppliers or because of the demand of foreign producers for higher quality of (local) inputs (Lipsey, 2002). The third type of linkage consists of forward linkages, which occur when foreign affiliates sell goods or services to domestic firms. Defined broadly, linkages can also be established to institutions such as universities, training centers and export promotion agencies (UNCTAD, 2001).

In addition, MNEs may facilitate access to foreign markets for the domestic producers, especially by processing information about their home economies. The links of foreign affiliates to MNE's intra-firm markets may also spill over to suppliers and other domestic firms, especially to those which succeed in enhancing their efficiency (UNCTAD, 2002). Apart from that, MNEs may lobby for favorable treatment of exports from the host economy in their home economies. All this may reduce the costs of entering foreign markets for domestic producers.

Through all of the above channels, FDI affects the factor productivities and thus the comparative advantages of host economies. Such a change inevitably influences the size, structure and direction of international trade. Therefore, FDI and trade become inseparable as "two sides of the coin of the process of economic globalization" (Sun, 2001)

It must however be noted that the extent of the spillovers and indirect effects of FDI on exports may depend on the initial technological and human capital level of the domestic producers, on the intensity of competition in domestic markets, as well as on the government policies promoting linkages between

domestic and foreign firms. Moreover, there are also potential negative effects of MNEs on domestic producers. Probably the most obvious example is the hypothetical situation in which MNEs capture domestic firms' market share and reduce the latters' profits or possibly endanger their survival (Barry and Bradley, 1997). Basically, an exporting domestic company may lose market shares in the export markets which were out of the reach of a foreign competitor before the latter made a market-seeking FDI, possibly because of administrative trade barriers (if, e.g., export markets are in a custom union with host country). Even if there were no such barriers and domestic producers were already exposed to foreign competition in the export markets, still inward FDI can negatively influence domestic export performance. It may be enough for an exporting domestic company to lose market share at home as a result of a market-seeking FDI from its competitors. As a consequence, it may be forced to produce at higher average costs, which may endanger its competitiveness and market share in the export markets as well and further increase the average costs of production. Another potential danger is the neglect of domestic firms by government policies if governments concentrate attention mostly on multinationals. Governmental over-reliance on multinationals in general may cause potential instability of host economies (UNCTAD, 2002; Barry and Bradley, 1997). Further examples in which FDI may reduce a host country's exports can be constructed. For example, if the FDI flows into a non-exporting industry of a country in which skilled managers are scarce, and if this MNE pays higher wages in order to attract high-quality workers (which, according to Lipsey, 2002, is often the case), then it is possible that the output of the exporting sector will be reduced due to the lack of skilled managers[2].

It is difficult, if not impossible, to find empirical evidence on specific types of spillovers through single channels, but there are studies which try to test for the presence of spillovers in general as well as through some specific channels. The results of this line of research will be briefly presented in the next section.

4. PREVIOUS EMPIRICAL FINDINGS

The empirical research on this topic may be divided into studies concentrating on the overall, macroeconomic impact of FDI on exports of the host countries and on those either analyzing the direct contribution of foreign affiliates or looking for evidence of spillover effects. The latter are the most common, but mostly do not capture the exports of foreign owned companies. On the other hand, just analyzing the specific investment projects and asking if they are export-oriented (Lipsey, 2002, states that it is generally found that foreign producers are more export-oriented than domestic firms) neglects the possible indirect effects.

The papers from Sun (2001), Zhang and Song (2000), and from Goldberg and Klein (1999) try to capture both the direct and the indirect effects of FDI on trade at the macroeconomic level, using econometric tools. Sun (2001) looks at the different impact of foreign investment on exports in three regions of China in a period from 1984 to 1997, and thus implicitly takes the specific initial conditions of the individual regions into account. He uses a panel data econometric model and finds that the effects of FDI on export performance vary across the three regions. The impact is positive and the strongest in the coastal region. In the central part of China it is weaker, but still positive and significant, while in the western region it is

[2] More generally, this may be considered as a form of a Rybczynski effect. Foreign capital flows into a non-exporting sector, raising the marginal product of labor in that sector. If factors are paid their marginal products, and labor is mobile between sectors, more workers will move to non-exporting industry, reducing the output of the exporting sector.

insignificant. Zhang and Song (2000) address the same research question in China at the provincial level in the period from 1986 to 1997 with a somewhat different empirical specification. Using the panel data model, they also find that higher levels of FDI are consistent with higher provincial exports. It is worth noting that the positive effect of FDI on exports in China has mostly been a direct one. Goldberg and Klein (1999) analyze the impact of FDI from the United States in the manufacturing sectors of individual Latin American countries on the net exports of those and other sectors. They basically test if the capital movements and trade in goods are substitutes or complements. Thanks to the detailed data on bilateral capital and trade flows between the U.S. and host countries in Latin America, they are also able to address the inter-sectoral spillovers in a more explicit way. The results vary across sectors and host countries, reflecting the importance of the specific conditions in individual countries and industries. The fact that the results are mixed makes it impossible for the authors to draw a strong and clear conclusion on the substitutability or complementarity of the FDI flows and trade.

Barry and Bradley (1997) concentrate on determining the nature of FDI in Ireland, analyze the effects of FDI on Irish exports in a more descriptive way, and conclude that there has been a significant direct contribution of foreign producers to the increase in Irish exports because the FDI in Ireland has mostly been export-oriented. The authors believe that a reduction in the almost total dependence on the United Kingdom as a trading partner that occurred as a consequence of FDI was especially important. They also mention the possibility of additional indirect influence through spillovers, but no attempt has been taken to show it empirically.

As for the studies on spillovers from foreign to domestic firms, there are simply too many papers on various types of spillovers and different channels for all of them to be presented here. Not only studies on export spillovers but also those on productivity spillovers are of importance. For this reason this part mostly relies on a presentation of the results of a recent literature review on FDI spillovers by Görg and Greenaway (2003). Out of 40 studies concerned with intra-industry productivity spillover effects from FDI on domestic firms in developed, developing and transition economies, 19 report statistically significant and positive spillovers, 15 studies do not find any significant effects, while 6 papers find some evidence of negative effects. Interestingly, many studies on FDI spillovers in transition countries find some evidence of negative spillovers. The evidence of positive horizontal, i.e. intra-industry spillovers, is even weaker if one considers some methodological drawbacks such as the potential bias of the cross-section estimates used in many of the reviewed studies.[3] Görg and Greenaway (2003) also give some possible explanations for these findings. For example, many studies use data with too high a level of aggregation, making the spillover effects much more difficult to detect, which does not mean that they do not exist. In addition, the spillovers may simply depend on some host country characteristics and on the type of FDI prevailing in these countries, leading to different (mixed) results for (different groups of) different countries.

The evidence on positive FDI productivity spillovers on forwardly and backwardly linked industries is somewhat more convincing than for the horizontal effects. The same is true for the papers dealing with the export spillovers. Three out of five papers included in the survey by Görg and Greenaway (2003) find

[3] At this point, it is important to mention the "meta analysis" of FDI and productivity spillovers by Görg and Strobl (2001). They investigate whether the study design affects the results and if there is a tendency in academic journals to publish the papers with statistically significant results. They conclude that the choice of empirical method used, and the definitions of the presence of multinationals affect the results, and that there is some evidence for the publication bias.

positive and significant effects of FDI on domestic firms' exporting activity, while the other two fail to establish any significant relationship. One of the papers they considered is a well-known study on export spillovers by Aitken, Hanson and Harrison (1997). They use panel data on Mexican manufacturing plants for 1986 and 1989, estimate a probit model, and find evidence that the higher export activities of multinational companies increase the probability that a firm in the same sector is an exporter. Using a similar empirical approach and data for Slovenian manufacturing sectors, Kumar and Zajc (2003)[4] find no evidence of intra-industry export spillover effects, nor do they find significant spillovers to forwardly linked industries from foreign producers to domestic firms. Moreover, their results suggest negative spillover effects from MNEs to backwardly linked industries. This result does not mean that FDI does not contribute to Slovenian exports because the method the authors apply does not consider direct effects. Moreover, it also does not consider the possibilities of some spillover channels such as workers' mobility to industries not directly linked to industry with foreign investment whose impact is being tested.

In addition to (possibly) increasing the size of domestic exports directly, and (possibly) increasing the probability of domestic firms becoming exporters through spillover effects, FDI can affect the structure and direction of a host country's exports. As for the studies concerning transition countries, Jensen (2002) investigates the impact of FDI on the structure of Polish exports and finds that inward FDI in Poland positively affected the technology intensity of exports. Repkine and Walsh (1998) use foreign direct investment in Bulgaria, Hungary, Poland and Romania to model the growth of EU-oriented output within industries (product categories that were exported to the EU before transition). The growth of this output segment was stronger than the growth of the non-EU-oriented production in all observed countries. The reasons are found to be the use of foreign capital and expertise enabling the easy privatization and restructuring of these industries. Djankov and Hoekman (1996) analyze the changes in the structure and destinations of exports of CEE countries. According to their findings, the Czech and Slovak Republics have experienced the greatest redirection of trade as well as the fastest growth of exports. On the other hand, the change of the composition of exports in these two countries has been relatively slow. In general, they find that the FDI inflows were strongly correlated with export performance and intra-industry trade levels.

5. DATA AND THE MODEL

The annual data used in this paper are for the period between 1996 and 2002. They encompass 21 branches of Croatian manufacturing industry by the National Classification of Economic Activities (NCEA).[5] Data on exports, productivity index, average monthly gross wages, gross value added, gross fixed capital formation, employment, and producers' price index (PPI) are obtained from the Central Bureau of Statistics of the Republic of Croatia (CBS), and the data on FDI and real effective exchange rates are obtained from the Croatian National Bank (CNB). Unit labor costs index was constructed as in Carstensen and Toubal (2004):

[4] This study was not considered by Görg and Greenaway (2003), and is the only paper known to the author of this paper that deals with export spillovers from FDI to domestic firms in transition economies.

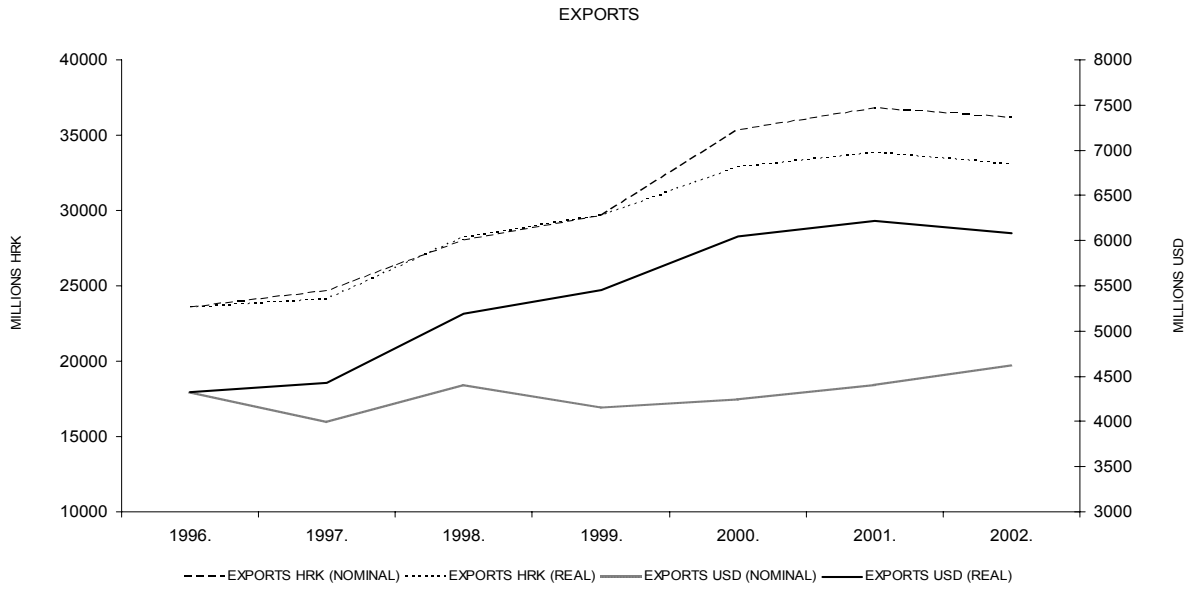
[5] Manufacturing industry encompasses NCEA subsections 15 – 37. In this research, subsection "37 Recycling" was left out because there are no exports for this branch, and subsection "30 Manufacturing of office machinery and computers" was left out because of missing data on productivity. See appendix for an overview of manufacturing industry by branches.

$$ULC_{jt} = \frac{W_{jt} E_{jt}}{GVA_{jt}}$$

where *ULC* stands for unit labor costs, *W* for average monthly gross wages, *E* is total employment and *GVA* is a gross value added of sector *j* in year *t*. Data on exports, FDI stock, wages, GVA and domestic investment were deflated using the PPI and converted into USD values. The base year for these data and other indices is always 1996. The PPI was available by branches only for the years 1998-2002, so that for the previous two years, the aggregate PPI was used for all branches. Index of productivity is calculated by the CBS as a relation between the total volume index of industrial production and the index of persons in employment. Figure 1 shows the development of aggregate manufacturing industry's exports over the period 1996-2002.

The relevant variable in the public discussions on stagnating exports is the one in USD and current prices. Nominal value of exports expressed in Croatian currency – the kuna (HRK) was increasing over the whole period except in 2002. The same is true for the real values of exports expressed in HRK and in USD. However, for the need of this research, real values were used in order to exclude the effects of price level changes. In order to obtain those, the HRK value of exports was deflated by the Croatian PPI.

Figure 1: Exports of Croatian manufacturing industry 1996-2002.

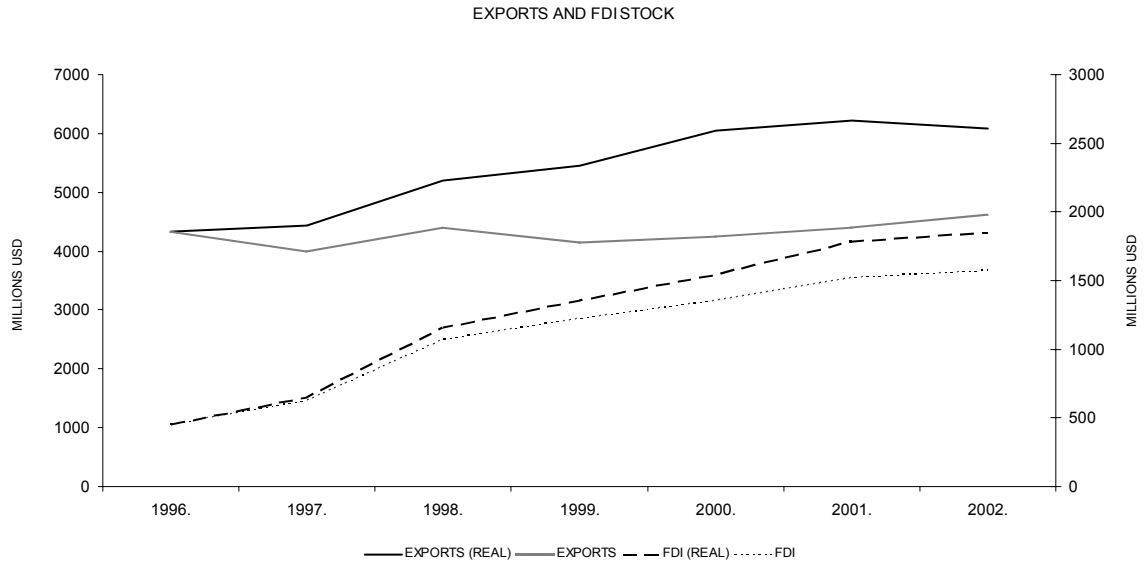


Comparing the real USD exports with real FDI stock variables over the period under study (Figure 2), one can observe very similar, increasing development for both variables except for the mentioned decline of exports in 2002.

Figure 3 compares the exports with the development of other relevant variables for the whole manufacturing sector: productivity index, real effective exchange rate and unit labor costs indices and domestic investment (gross fixed capital formation). The productivity in manufacturing industry has been increasing over the whole period. This should have been promoting exports along with the decreasing unit labor costs. As for the real effective exchange rate (defined so that an increase in index denotes real depreciation), it depreciated over the first four years of the observed period, reaching a peak in 2000 with

an index value of 114.09, and appreciating afterwards. Domestic investment increased in 1997, but decreased over the following two years. It rose again over the last three years under observation.

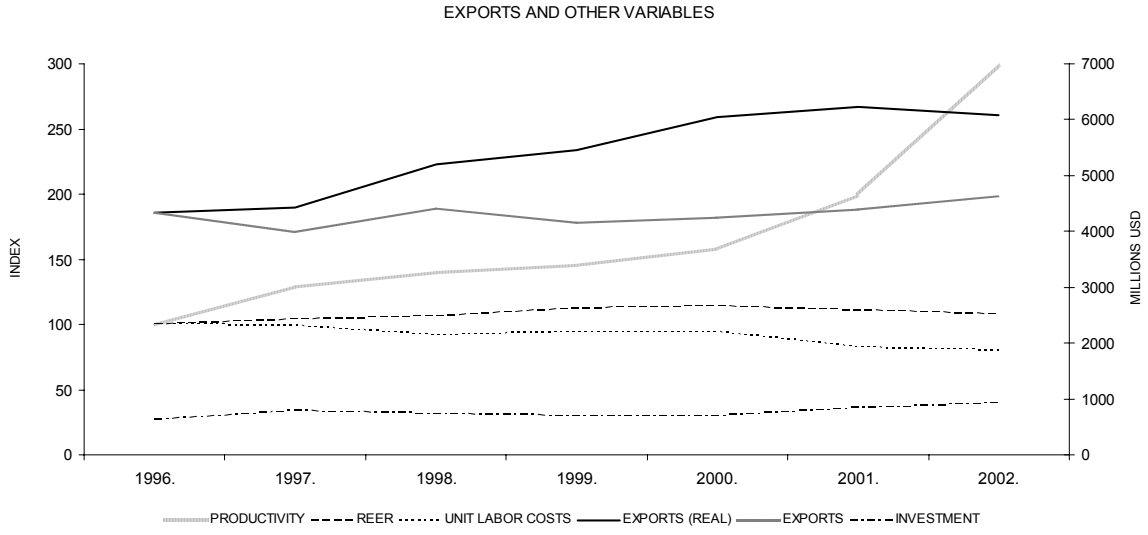
Figure 2: Exports and FDI stock 1996-2002.



Note:

FDI stock – right axis, exports – left axis

Figure 3: Exports, productivity, investment, unit labor costs and real effective exchange rate.



Note: Productivity, REER and unit labor costs – left axis, exports and investment – right axis

The above developments were not common to all branches of manufacturing industry. The heterogeneity within the sector is visible from table 2. There were two branches for which the average growth of real exports was negative over the observed period – subsections 18 *Manufacture of wearing apparel; dressing and dyeing of fur* and 19 *Tanning, handbags, saddlery, harness and footwear*, with average growth values of -1.87 and -1.74% respectively. For all other branches, average growth was positive with the maximal value of 57.6% for subsection 35 *Manufacture of other transport equipment*. The inflow of foreign direct investment was unequally distributed over the branches so that the resulting FDI stock was highly concentrated in branches 15 *Manufacture of food products and beverages*, 24 *Manufacture of*

chemicals and chemical products and 26 *Manufacture of other non-metallic mineral products*. These were not industries with exceptionally high export growth. Two industries with negative productivity growth were 18 *Manufacture of wearing apparel; dressing and dyeing of fur* and 32 *Manufacture of radio, television and communication equipment and apparatus*. While subsection 18 was characterized with negative export growth, the latter's exports grew by an average rate of 23.03%. The highest average productivity growth was observed in industry 34 *Manufacture of motor vehicles, trailers and semi-trailers*, which had no exceptional values for exports and FDI stock. It amounted to 84.93%. As for the unit labor costs, most industries experienced a fall on average, the decline being rather high in branches 24 *Manufacture of chemicals and chemical products* and 33 *Manufacture of medical, precision and optical instruments, watches and clocks*. The highest increase in unit labor costs was observed in industry 27 *Manufacture of basic metals* where it amounted to 6.4%. The only industry with a negative average growth of domestic investment was 16 *Manufacture of tobacco products*, with a value of -12.51%. The two highest average growth rates of the same variable were in industries 23 *Manufacture of coke, refined petroleum products and nuclear fuel* (81.49%) and 35 *Manufacture of other transport equipment* (63.21%). Both of these industries were comparatively unattractive to foreign investors. Another insight from table 2 is that there is relatively little added value in Croatian exports, as shown by the ratios between the average value of exports and gross added value of single industries.

The correlation coefficients between analyzed variables and some others relevant for the latter estimations are given in the table 3. The two variables with the highest correlation coefficient with the dependent variable in the latter estimations – exports, are domestic investment (0.342) and FDI stock (0.238). The coefficient between these two independent variables is rather high and amounts to 0.612. As for the other variables, productivity is relatively highly correlated with unit labor costs (-0.418), employment (-0.814) and the lagged change of employment (-0.382).

Table 2: Descriptive statistics of variables by branches

NCEA	*Exports/GVA*	Exports			FDI stock			Productivity			Unit labor costs			Investment		
	Avg. value	Avg. value	Std. dev.	Avg. growth	Avg. value	Std. dev.	Avg. FDI inflow	Avg. value	Std. dev.	Avg. growth	Avg. value	Std. dev.	Avg. growth	Avg. value	Std. dev.	Avg. growth
15	*54.96*	438.83	46.00	1.63	116.65	71.26	28.74	103.21	9.48	3.58	89.01	5.70	-2.81	215.47	33.88	0.33
16	*61.98*	56.56	35.67	49.48	3.79	4.73	1.26	149.50	48.24	14.27	106.37	36.20	1.63	14.18	5.41	-12.51
17	*222.96*	201.43	51.85	9.36	4.19	4.02	1.70	189.76	66.09	22.59	81.56	9.12	-4.60	8.01	6.52	68.81
18	*250.79*	569.71	29.82	-1.87	2.39	1.21	0.59	95.26	3.05	-0.82	96.99	11.19	-2.71	19.11	6.90	12.97
19	*367.08*	244.33	15.94	-1.74	0.74	1.29	0.51	118.87	11.93	5.49	98.94	3.49	-0.53	4.65	1.98	15.62
20	*185.72*	246.25	28.45	3.77	5.19	1.97	0.65	122.48	13.25	6.41	91.69	6.53	-2.06	19.14	6.41	22.87
21	*104.55*	102.06	23.65	10.37	17.27	13.15	4.71	179.70	75.37	22.56	83.85	19.44	-5.56	31.28	16.58	24.49
22	*14.28*	35.25	15.81	30.12	26.03	17.98	6.06	229.11	120.65	34.48	106.22	8.28	0.87	38.45	15.21	25.94
23	*88.00*	422.38	63.12	3.26	0.00	0.00	0.00	107.31	13.22	4.04	97.84	16.12	4.40	25.73	21.01	81.49
24	*125.89*	639.78	46.64	0.56	652.11	246.87	116.11	122.06	18.39	7.77	66.88	15.31	-8.43	109.10	25.99	13.03
25	*76.49*	103.24	19.94	11.43	10.43	8.69	3.50	109.80	16.86	6.88	89.33	16.16	-6.35	20.75	5.73	12.31
26	*77.74*	209.49	59.36	12.06	269.26	157.66	65.22	131.41	33.70	12.00	86.09	14.33	-6.43	83.72	28.64	30.03
27	*279.48*	169.23	22.86	6.91	4.11	4.29	1.86	172.77	35.80	14.35	116.25	20.83	6.40	21.91	22.91	55.91
28	*54.37*	142.64	35.49	10.95	17.21	6.72	2.99	164.14	41.06	14.90	93.30	9.06	-3.80	28.27	10.74	38.45
29	*171.12*	238.84	62.76	12.53	14.63	9.53	3.34	144.49	52.81	18.24	113.45	16.57	0.90	15.35	4.05	12.59
31	*152.72*	280.96	43.26	6.24	44.14	12.28	5.76	116.26	28.75	11.00	110.66	11.35	0.54	21.66	6.85	16.94
32	*169.84*	139.45	59.67	23.03	43.47	3.78	2.10	76.34	14.41	-3.90	103.75	38.07	2.15	9.97	1.13	1.55
33	*152.11*	52.24	19.82	16.55	0.00	0.00	-0.02	215.07	67.63	23.11	64.99	20.88	-11.36	2.77	1.10	27.13
34	*338.42*	87.62	13.18	8.56	9.92	4.37	1.65	639.71	691.28	84.93	62.23	19.84	-7.85	6.61	3.13	26.92
35	*350.76*	824.37	369.48	57.60	5.78	7.47	1.92	155.57	43.97	15.77	83.88	10.27	-2.39	44.69	39.56	63.21
36	*135.76*	189.97	36.12	8.40	7.50	8.31	3.18	173.04	50.01	18.32	86.06	12.82	-6.13	16.95	4.19	5.95

Notes: Average value for exports/GVA in percent. Average value for exports, FDI stock and investment in Mio. USD. Average FDI inflow in Mio. USD. Average value for productivity and unit labor costs in index values. Average growth in % for all variables

Source: authors calculation.

Table 3: Correlations

	FDI	Investment	Productivity	Unit labor costs	REER	Employment	ΔEmployment
Exports	0.238	0.342	-0.312	-0.151	0.060	0.131	0.043
FDI		0.612	-0.061	-0.303	0.205	0.060	0.019
Investment			-0.210	-0.092	-0.015	0.238	0.180
Productivity				-0.418	0.085	-0.814	-0.382
Unit labor costs					0.007	0.501	0.440
REER						-0.198	0.023
Employment							0.314

The two employment variables are relatively strongly correlated with unit labor costs as well and the coefficients amount to 0.501 and 0.440. This is understandable and expected considering the construction of the productivity and unit labor costs variables described above.

The following models will be estimated:

$$\ln EX_{jt} = \alpha_j + \beta_1 \ln PD_{jt} + \beta_2 \ln ULC_{jt} + \beta_3 \ln REER_t \quad (1)$$

$$\ln EX_{jt} = \alpha_j + \beta_1 \ln PD_{jt} + \beta_2 \ln ULC_{jt} + \beta_3 \ln REER_t + \beta_4 \ln I_{j(t-1)} \quad (2)$$

$$\ln EX_{jt} = \alpha_j + \beta_1 \ln PD_{jt} + \beta_2 \ln ULC_{jt} + \beta_3 \ln REER_t + ... + \beta_5 \ln FDI_{j(t-1)} \quad (3)$$

$$\ln EX_{jt} = \alpha_j + \beta_1 \ln PD_{jt} + \beta_2 \ln ULC_{jt} + \beta_3 \ln REER_t + \beta_4 \ln I_{j(t-1)} + \beta_5 \ln FDI_{j(t-1)} \quad (4)$$

The dependent variable ln*EX* is natural logarithm of real exports. Independent variables in the first specification are the natural logarithms of productivity index ln*PD*, of unit labor costs index ln*ULC* and of real effective exchange rate ln*REER*. Subscript j = 1…21 denotes different branches and t stands for different years, ranging from 1996 to 2002. The fixed effects one-way error component model is used for the estimation. The constant term α_j denotes the branch-specific fixed effects. Domestic investment (ln*I*) and FDI stock (ln*FDI*) variables, used separately in second and third model specifications (because of relatively high correlation coefficient between these variables) and together in the fourth, enter the regression with a one year lag. This can be justified by the fact that some time is needed before the new investment becomes effective. In the case of FDI, using lagged values should help to alleviate a potential simultaneity problem between exports and FDI variables. Using FDI stock values instead of inflows should help in this respect as well. In addition, FDI stock should better capture the relevance of the presence of foreign capital in some branch, which is important as a source of potential indirect effects described earlier. If only FDI inflows values were used, then there might be cases in which a substantial inflow took place at the beginning of the observed period without there being any inflows afterwards. In this way the values of this variable would be zero for all the subsequent years, which would neglect the strong presence of the foreign capital already invested, which may be a source of potentially important side effects. There is a potentially important variable which is not included in the above model – the export markets. The reason this is left out is that it is very difficult to find a good proxy. Using GDP growth of countries which are important export destinations turned out to be insignificant. The reason is that within this indicator, there may be quite different developments for single industries. The effects of this omitted variable are thus captured by the individual effects term α_j and the fact that this variable is omitted does not affect the consistency of the estimations. The same should hold for potentially relevant policy variables not included in the regressions such as tariffs, effective tax rates and subsidies. Data on tariffs are not available

according to NCEA methodology, only for single products. Therefore, there may be different tariffs within one class and the correct way to apply this information empirically would require weighting the tariffs according to the share of single products in the exports of a single NCEA sector and the share of different export destinations. Unfortunately, the data needed were not available. Data on subsidies are not available for single industries, like the data on effective tax burden.

The above model specifications are modifications and extensions of the models estimated at the aggregated, macroeconomic level in Sun (2001) and Zhang and Song (2000). Both of these papers use natural log of real exports as dependant variable and lagged logarithm of FDI stock variable. Sun (2001) also uses domestic investment, and both papers add exchange rate as independent variable as well. In this paper, productivity and unit labor costs variables are added because they are expected to be significant determinants of industries' export competitiveness.

Another potential problem is the possible simultaneous causal relationship between exports and productivity identified in international trade theory and tested in the previous literature (see e.g. Kunst and Marin, 1989). In order to account for this possibility, instrumental variables were used instead of productivity variables. In the search for appropriate instruments, using the employment variable turned out to be a good idea, since earlier research had concluded that most productivity increases were due to the decreasing number of workers in the manufacturing industry (Nikić, 2003). In addition, productivity could be increased through investment in new technology or some transfer of knowledge. This justifies using domestic and foreign investment variables as instruments for productivity, especially since Škudar (2004) finds that firms with foreign ownership managed to increase productivity at a higher rate than domestically owned enterprises. The following specifications will be tested in order to find appropriate instruments for productivity:

$$\ln PD_{jt} = \alpha_j + \beta_1 \ln EMP_{j(t-1)} \quad \text{(P1)}$$

$$\ln PD_{jt} = \alpha_j + \beta_1 \ln EMP_{j(t-1)} + \beta_2 \Delta EMP_{j(t-1)} \quad \text{(P2)}$$

$$\ln PD_{jt} = \alpha_j + \beta_1 \ln EMP_{j(t-1)} + \beta_2 \Delta EMP_{j(t-1)} + \beta_3 \ln I_{j(t-1)} \quad \text{(P3)}$$

$$\ln PD_{jt} = \alpha_j + \beta_1 \ln EMP_{j(t-1)} + \beta_2 \Delta EMP_{j(t-1)} + \ldots\ldots\ldots\ldots\ldots + \beta_4 \ln FDI_{j(t-1)} \quad \text{(P4)}$$

$$\ln PD_{jt} = \alpha_j + \beta_1 \ln EMP_{j(t-1)} + \beta_2 \Delta EMP_{j(t-1)} + \beta_3 \ln I_{j(t-1)} + \beta_4 \ln FDI_{j(t-1)} \quad \text{(P5)}$$

In the above equations, ln*EMP* stands for the lagged value of the employment index, while ∆*EMPL* denotes the percentage change of the employment index in the previous period. All other variables are same as before. The results of all the estimations are presented and discussed in the next section.

6. RESULTS

Table 4 contains the results of the one-way error component fixed effects panel data estimations for models 1 – 4.[6] In the first model specification all variables are significant at the 1% level with predicted signs. Productivity increases, real effective exchange rate depreciation and fall in unit labor costs promote exports. Including domestic investment in the regression (model 2) does not change these results, except to increase the absolute value of the coefficient of unit labor costs. The investment variable does not turn out to be significant. In the third specification, the FDI stock variable is included instead of domestic investment. The new variable is significant at the 10% level, with a positive, but relatively small coefficient. Productivity remains highly significant unlike unit labor costs.[7] The coefficient and significance of the real effective exchange rate is lower, and this variable is now significant only at the 10% level. Including the domestic investment and FDI variables together in the fourth model specification yields the following results: Productivity and unit labor costs are significant only at the 10% level, real effective exchange rate turns out not to be relevant, and both investment variables are significant and with positive coefficients – domestic investment at the 10% and FDI at the 5% level. These variables obviously "pick up" some of the influence of the variables in model 1, but the results of the last specification must be taken with some caution because domestic investment and foreign direct investment variables, which have a relatively high simple correlation coefficient, enter the regression together. Despite this, there are no other usual symptoms of multicollinearity (as described e.g. in Pindyck and Rubinfeld, 1998).

Table 4: Results I

Dependant variable: Exports Estimation method: Fixed Effects – OLS Estimation				
	Model 1	Model 2	Model 3	Model 4
Constant	-5.258** (2.416)	-4.780* (2.795)	-2.088 (3.129)	-0.718 (3.624)
Productivity	0.304*** (0.082)	0.314*** (0.087)	0.302*** (0.090)	0.176* (0.099)
Unit labor costs	-0.372*** (0.135)	-0.564*** (0.130)	-0.140 (0.165)	-0.305* (0.162)
REER	2.269*** (0.509)	2.303*** (0.579)	1.303* (0.685)	1.186 (0.777)
Investment	---	0.057 (0.039)	---	0.093* (0.052)
FDI	---	---	0.057* (0.030)	0.091** (0.035)
Observations	147	126	115	102
Adj. R^2	0.45	0.48	0.45	0.48

Note: Standard errors are in parentheses. ***, **, * indicate significance at the 1 percent, 5 percent and 10 percent levels, respectively.

In order to check for the potential endogeneity of the productivity variable, possibly arising because of simultaneous causal relationship between productivity and exports (see Kunst and Marin, 1989), models

[6] Also the results of the random effects panel data estimations (given in the appendix) are discussed here, but only shortly because they are only slightly different from the results of the fixed effects estimations. Nevertheless, this shows the robustness of the results to applying different methods.

P1 – P5 are estimated in order to find appropriate instruments for productivity in the latter instrumental variables estimation. The results are presented in table 5. As previously mentioned, the observed increases in productivity of manufacturing industry are mostly due to cuts in the number of employees. Therefore, the first specification uses lagged natural logarithm of employment index. It is significant at 1% level and the adjusted R^2 is 0.64. Adding the lagged growth of the employment variable (model P2) increases the explanatory power of the model (R^2 is equal to 0.71). Domestic investment is added in the model P3, but it turns out to be insignificant. Opposite is true for FDI stock (model P4), which positively and significantly influenced productivity. The R^2 of the fourth model is 0.67. In the fifth specification, with both investment variables, domestic investment remains insignificant, while the coefficient and the significance of FDI stock variable is increased. The explanatory power of the model is reduced relative to model P4.

Table 5: Results II

Dependant variable: Productivity Estimation method: Fixed Effects – OLS Estimation					
	Model P1	Model P2	Model P3	Model P4	Model P5
Constant	10.869*** (0.396)	11.163*** (0.363)	10.576*** (0.484)	10.921*** (0.754)	10.617*** (0.856)
Employment	-1.325*** (0.089)	-1.405*** (0.082)	-1.283*** (0.104)	-1.413*** (0.151)	-1.371*** (0.169)
ΔEmployment	---	-0.917*** (0.174)	-0.928*** (0.172)	-0.723*** (0.195)	-0.781*** (0.190)
Investment	---	---	0.020 (0.032)	---	-0.026 (0.045)
FDI	---	---	---	0.046** (0.018)	0.074*** (0.024)
Observations	147	147	126	115	102
Adj. R^2	0.64	0.71	0.62	0.67	0.65

Note: Standard errors are in parentheses. ***, **, * indicate significance at the 1 percent, 5 percent and 10 percent levels, respectively.

As a result, the variables in models P2 and P4 are chosen as best candidates for the instruments of productivity variables in two step least square (2SLS) instrumental variables estimations.[8] The results of these regressions are presented in table 6. The first two columns of the table 6 contain the results for the model 1 in which productivity is instrumented with two employment variables (model IV1 with P2), and with two employment variables and FDI stock (model IV2 with P4). The test of the joint null hypotheses that the equation is properly specified and the instruments are valid instruments (i.e. uncorrelated with the error term) has been conducted. The p-values imply that using only employment variables as instruments is a better choice, i.e. model is correctly specified and we cannot reject the null hypotheses of no correlation between the instruments and the errors in equation 1. Comparison of these results with the results of the

[7] In the same specification, only without productivity variable, unit labor costs are significant at the 10% level, but the adjusted R^2 is much lower and amounts to 0.38. As noted by an anonymous referee, unit labor costs alone are probably not sufficient to explain changes of exports due to different cost base of competitors in different industries.

[8] In searching for the appropriate instruments of the productivity variable, specifications including real effective exchange rates were also estimated under the assumption that exchange rate developments "forced" the enterprises to search for other ways to improve their export competitiveness i.e. to increase productivity ("the productivity whip"). These results are not shown here because this variable always turned out to be insignificant for productivity.

OLS estimates of model 1 (table 4), reveals that the significance and the coefficient of the productivity variable have decreased. Unit labor costs and real effective exchange rates remain significant at 1% level.

Table 6: Results III

Dependent variable: Exports Estimation method: Fixed Effects – IV Estimation					
	Model IV1 (with P2)	Model IV2 (with P4)	Model IV3 (with P2)	Model IV4 (with P4)	Model IV5 (with P2)
Constant	-5.446** (2.433)	-5.366** (2.646)	-4.602 (2.813)	-5.899* (3.284)	-0.799 (3.816)
Productivity	0.214* (0.112)	0.353*** (0.111)	0.255** (0.122)	0.352*** (0.121)	0.183 (0.136)
Unit labor costs	-0.442*** (0.148)	-0.261 (0.167)	-0.603*** (0.142)	-0.366** (0.172)	-0.302* (0.168)
REER	2.472*** (0.539)	2.150** (0.546)	2.364*** (0.586)	2.279*** (0.670)	1.195 (0.789)
Investment	---	---	0.060 (0.040)	0.122** (0.053)	0.093* (0.052)
FDI	---	---	---	---	0.090** (0.038)
Observations	147	115	126	102	102
P-value	0.533	0.066	0.250	0.033	0.819
Adj. R^2	0.44	0.43	0.48	0.43	0.48

Note: Standard errors are in parentheses. ***, **, * indicate significance at the 1 percent, 5 percent and 10 percent levels, respectively.

In the next step, model 2 was estimated using only employment variables (model IV3 with P2) and using employment variables and FDI stock as instruments (model IV4 with P4). Again, p-values of test statistics speak in favor of using only employment variables as instruments. Compared to results from OLS estimations (model 2 in table 4) the significance and the coefficient of the productivity variable are now lower. Last regression uses employment variables as instruments for productivity, but adds FDI stock as an independent variable (model IV5 with P2). The results are very similar to the ones from the OLS estimation of model 4 in table 4, except that now productivity is insignificant.

Overall, one can make following conclusions: The positive and significant effect of FDI on exports seems to be quite robust, although with a relatively small coefficient. A 1% increase in FDI stock leads to a 0.09% increase of exports. In addition, this effect seems to be captured by the productivity variable if FDI stock is left out from the regressions. That FDI positively influences productivity is in line with the findings from Škudar (2004). It seems likely that productivity was the channel through which FDI has contributed to better export performance. On the other hand, when productivity is instrumented with employment variables its impact on exports is insignificant (model IV3 with P2) or significant only at the 10% level (model IV1 with P2). This implies that productivity increases induced by employment cuts did not promote exports. On the other hand, unit labor costs turn out to be a relevant determinant of exports (except in model 3, table 4). The initially significant results for real effective exchange rate are weakened after introducing investment variables into the model (models 3, 4 and IV5 with P2). This may be due to loss of degrees of freedom. Also, the possibility of the multicollinearity in the specifications with both investment variables cannot be excluded. It is very difficult to draw a clear conclusion about the effect of this variable

on exports, especially since the effects of the changed imported input prices on exports may weaken the theoretically predicted influence of the exchange rate on exports. This has not been the primary goal of this paper, but the fact that real effective exchange rate did not have a very important impact on exports over the observed period is also in line with research results from Babić (2002) and Galinec and Jurlin (2003). Stučka (2004) finds only a limited positive impact of potential currency depreciation on the Croatian trade balance. It must be stated here that for the model IV5 with P2, this variable barely fails the 10% significance level limit (p-value of t-statistic is 0.13). The results for domestic investment are mixed and not very convincing and for the fixed effects model. It is significant only at the 10% level after controlling for the FDI stock variable. But the results of the random effects model (tables A1 and A2 in the appendix) reveal higher importance of this variable for exports.

7. CONCLUSIONS AND POLICY RECOMMENDATIONS

The exports of Croatian manufacturing industry have been stagnating over the last decade or so. Over the same period there have been relatively high inflows of foreign direct investment (FDI) into industry. The aim of this paper was to examine, after controlling for other potentially significant variables, whether these inflows have had an impact on export performance. The panel data approach for 21 manufacturing industry sectors over the period between 1996 and 2002 yields results that suggest a positive and statistically significant effect of foreign direct investment on exports, mainly through productivity increases.

The impact of productivity on exports was highly significant and relatively strong in the models without investment variables. This is in accordance with expectations and the results of other empirical studies. After including FDI and domestic investment variables, the significance of productivity diminishes and in some models it is no longer relevant for exports. This implies that the part of productivity growth that was due to FDI and domestic investment, was relevant for export growth. The impact of FDI was relatively weak, while the results for domestic investment are mixed for the fixed effects specifications. On the other hand, the results of the random effects estimations reveal a positive and significant effect of domestic investment on exports. This effect was also relatively weak, but still somewhat stronger than for the FDI. This suggests that there are some constraints on export expansion, due to either limited production capacity or, more likely, the lack of modern production technology in Croatian manufacturing industry (or both). A clear recommendation for economic policy is to promote investment in order to overcome the existing limitations. Some of the ways in which this may be accomplished are improving investment climate in the country and attracting more FDI in the manufacturing industry. Lower unit labor costs also significantly contributed to promoting exports. This result too is in line with expectations. Although the significance of the unit labor costs also diminishes after including the investment variables, they still remain a significant determinant of exports, with a higher coefficient than the productivity variable. It has been mentioned that unit labor costs alone are probably not sufficient to explain changes of exports, due to the different cost bases of competitors in different industries. Despite this fact, the results suggest that the relative level of wages is an important factor for export competitiveness. At the same time, it is difficult to draw clear conclusions about the role of real effective exchange rate development. Most specifications show positive, strong and significant impact on exports, but this is weakened after including investment variables in the model. This may be due to loss of degrees of freedom in the specifications with more variables. However, the effects of changes of imported input prices due to exchange rate changes may

weaken the theoretically predicted influence of the exchange rate on exports. In addition, considering the other potential adverse effects of exchange rate devaluation (see section 2) on the economy, it turns out that exchange rate policy cannot be used effectively for export promotion.

With respect to FDI, it has been mentioned that there is a potential for improving the export performance of Croatian manufacturing industry by attracting more FDI into this sector.[9] This calls for more active investment-promoting policy measures. However, the policy makers should also try to enhance the potential positive effects of FDI by targeting specific export-oriented greenfield foreign investment, and, in addition, implement measures which should increase potential spillover effects.

In an extensive study, Babić, Pufnik and Stučka (2001) analyze, among other things, the determinants of the attractiveness of Croatia for foreign investors and discuss the existing Law on Investment Promotion. Unfortunately, most of the drawbacks of the Law[10], as well as the other factors impeding more FDI inflows in Croatia emphasized in that study are still valid. The Croatian market is comparatively small, with moderate consumption potential and high unemployment. Some positive developments in trade liberalization and integration with other markets have improved the Croatian position as a potential production location for export-oriented foreign investors. The public administration is still inefficient and corrupt, the judiciary is slow and thus the protection of property rights is inefficient. The relevant infrastructure is still underdeveloped, despite large public investment in road building. The Law on Investment Promotion leaves lots of room for discretionary decisions increasing the uncertainty of potential foreign investors regarding the treatment to be expected; it discriminates between domestic and foreign enterprises as well as between small and large companies, giving domestic and larger firms certain advantages. It also implies more favorable treatment of companies in certain industries, especially of labor-intensive production. There are no special incentives for export-oriented investment projects, from which the most spillover effects can be expected especially if they are conditional on more extensive use of domestic inputs into production. Special treatment of export-oriented FDI gains even more importance for a comparatively small market such as the Croatian. Babić, Pufnik and Stučka (2001) also point out that investment promotion activity has been very low and that the Law on Investment Promotion was more "words on paper". In other words, they see its major purpose in gaining political points for the coalition government from 2000 to 2004, while the actual political willingness for stronger FDI promotion is lacking.

While dealing with the above problems would certainly contribute to higher FDI inflows to Croatia, there are other measures as well which can be implemented additionally in order to magnify the potential positive spillover effects from foreign investment. Basically, host countries may condition FDI incentives on mandatory measures or use the incentives to encourage investors to behave in certain way (UNCTAD, 2003). Such performance requirements may include the export orientation of production, which has already been mentioned, but they may relate to training of local workers and technology transfers as well. An important aspect of the host countries' policies aimed at enhancing benefits from FDI is to strengthen the host countries' own capabilities. Only if the human capital in host countries is at a sufficiently high level regarding the relevant skills can there be increased absorptive capacity for the knowledge spillovers disseminated by the foreign investors.

[9] The need for a stronger investment promotion agency in attracting export-oriented greenfield investment was also recognized by Galinec and Jurlin (2003).
[10] Šoštarić (2004) gives a more recent critical review of the Law on Investment Promotion.

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Appendix

Manufacturing industry by branches (NCEA)

D	Manufacturing
15	Manufacture of food products and beverages
16	Manufacture of tobacco products
17	Manufacture of textiles
18	Manufacture of wearing apparel; dressing and dyeing of fur
19	Tanning, handbags, saddlery, harness and footwear
20	Manufacture of wood and of products of wood and cork, not including furniture; manufacture of articles of straw and plaiting materials
21	Manufacture of pulp, paper and paper products
22	Publishing, printing and reproduction of recorded media
23	Manufacture of coke, refined petroleum products and nuclear fuel
24	Manufacture of chemicals and chemical products
25	Manufacture of rubber and plastic products
26	Manufacture of other non-metallic mineral products
27	Manufacture of basic metals
28	Manufacture of fabricated metal products, except machinery and equipment
29	Manufacture of machinery and equipment n.e.c.
31	Manufacture of electrical machinery and apparatus, n.e.c.
32	Manufacture of radio, television and communication equipment and apparatus
33	Manufacture of medical, precision and optical instruments, watches and clocks
34	Manufacture of motor vehicles, trailers and semi-trailers
35	Manufacture of other transport equipment
36	Manufacture of furniture; manufacturing, n.e.c.

Table A1: Results of random effects estimations I

Dependent variable: Exports Estimation method: Random Effects – GLS Estimation				
	Model 1	Model 2	Model 3	Model 4
Constant	-5.466** (2.495)	-4.793* (2.906)	-1.259 (3.230)	-0.035 (3.701)
Productivity	0.263*** (0.084)	0.252*** (0.088)	0.250*** (0.090)	0.129 (0.095)
Unit labor costs	-0.391*** (0.138)	-0.575*** (0.133)	-0.149 (0.167)	-0.325** (0.163)
REER	2.374*** (0.524)	2.369*** (0.601)	1.239* (0.689)	1.193 (0.776)
Investment	---	0.079** (0.039)	---	0.106** (0.051)
FDI	---	---	0.065** (0.029)	0.090*** (0.034)
Observations	147	126	115	102
Adj. R^2	0.45	0.48	0.45	0.48

Note: Standard errors are in parentheses. ***, **, * indicate significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table A2: Results of random effects estimations II

Dependant variable: Exports Estimation method: Random Effects – IV Estimation		
	Model IV1 (with P2)	Model IV5 (with P2)
Constant	-5.653** (2.511)	-0.097 (3.827)
Productivity	0.172 (0.114)	0.137 (0.129)
Unit labor costs	-0.462*** (0.151)	-0.321* (0.167)
REER	2.579*** (0.554)	1.195 (0.776)
Investment	---	0.105** (0.051)
FDI	---	0.090** (0.036)
Observations	147	102
Adj. R^2	0.44	0.48

Note: Standard errors are in parentheses. ***, **, * indicate significance at the 1 percent, 5 percent and 10 percent levels, respectively.

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