

# **THE LOCATIONAL DETERMINANTS OF DIRECT INVESTMENTS IN THE BULGARIAN MANUFACTURING**

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## **Introduction**

The ongoing process of integration of international economic activities and the increasing insertion of Eastern European countries in the international division of labour, inclined to signify the western direct investment as a vital factor for economic stabilisation of these countries and the acceleration of the rhythms of their transition process. FDI has been considered as a crucial parameter of the systemic transformation (see Blanchard & *al.*, 1991 and Dunning, 1993). Besides the well known and widely accepted advantages of FDI (transfer of technology, transfer of capital, efficiency gains and competitiveness) there are other equally important and inherent to transition period (speedup of firms' restructuring, reorientation of trade flows etc).

The systemic rupture comprised the ignition for the acceleration of internationalisation process of the Bulgarian economy, as for the creation of the appropriate institutional and economic context, which would attract Multinational Enterprises (MNEs), so the necessary flows of foreign capital and know-how (a necessary condition for the restructuring process) could be achieved. The liberalisation of economic activities and the redistribution of property rights, contributed to the attraction of a total amount of 1403 US\$ million of FDI up to 1997, given the fact that they did not succeed to improve substantially the global attractiveness of the country.

Formal empirical analysis of the determinants of distribution of inward FDI in the transition economies of Balkan countries is rather limited. Also previous studies deal with major developed host countries such as the US, Canada and UK (Caves, 1974 ; Lall and Siddharthan, 1982), or developing countries such as India (Kumar, 1990), and China (Liu, 2000). The aim of this paper is therefore to explain the determinants of distribution of inward flows of FDI in Bulgaria for the period between 1993 and 1997.

The paper is organised as follows: the second section of the paper deals with the analysis of the structure and motives of FDI in Bulgaria, section 3 review the relevant theoretical developments. Section 4 discusses the variables used to explain them empirically and describes the estimation technique. The model allows for time variation and industry variation in a pooled times series of tobit model. Section 5 presents the empirical results.

## **Analysis of the Structure and Motives for FDI in Bulgaria**

Investment inflows to the transition countries (including CIS) reached 74,534 US\$ million in 1997, a 41.2% increase compared to 1996. Increase for the Balkan countries was above the average (68.6%), but globally FDI remain weak in this region (6,034 US\$ million, or 8.1% of the total, against 57,3 % for Central Europe). FDI per capita is also very low (104 US\$, against 662 US\$ in Central Europe).

Meanwhile, important differences characterise the Balkan countries. During the period 1990-1997, Slovenia receives regular and important FDI inflows though its share in the region diminish. Romania seems to become progressively a major destination of foreign capital since 1995, whereas Bulgaria register a steady decrease of its relative part up to 1996 and Albania suffer from internal institutional and politico-economic instability<sup>1</sup>. Only Slovenia and, to a lesser extend, Croatia register relatively high cumulative inflows of FDI per capita.

Concerning Bulgaria, an important increase of FDI inflows in 1997 has followed the decline of 1995 and the quasi-stagnation of 1996, according to the UNCTD data. Information obtained from the Bulgarian Foreign Investment Agency (Table 1) indicates also a growing number of FDI operations (10,078 compared to 4,881 at the end of 1995). Up to the end of 1995, the value of FDI flows grew slower than the number of investments and the amount of average investment tend to decrease. 73% of them were less than 1000 US\$, and about 89% did not exceed 10,000 US\$. On the other side, there were 70 FDI operations of more than US\$ one million each, which aggregated to 90% of the total FDI stock. Though these proportions do not change dramatically, a significant change took place in 1997, thanks to the two big operations in the chemicals and non-ferrous metallurgy sectors performed by the Belgian firms Solvay (chemical industry) and Union Minière (copper production).

Firms from Western European countries represent the bulk of total FDI inflows. At the end of 1997, Belgium firms account for about 20.5% of the total, followed by Germany (20.0%), USA (8.2%), Netherlands (7.2%), Switzerland (5.4%) and Greece (5.1%). Some American companies have invested in Bulgaria through their European affiliates and their real share in FDI stock is certainly underestimated. Greece (6th in terms of FDI value) has the largest number of investments (about 12.7 % of the total FDI operations).

Regarding to the fields of activity, 55.2% of total FDI stock was invested in manufacturing at the end of 1997. Construction and transport attracted respectively about 1.0% and 5.6%, while trade attracted 17.2% of invested capital. Concerning investment in manufacturing, and according to the available data for operations of more than 100,000 US\$ (total value of about 774 US\$ million – own calculations), the investments of Solvay and Unions Minière account for 35% of the total. Various industrial branches (electronics, sanitary products, paper, machinery,...) have attracted foreign investment but the only significant concentration is visible in the food industry with about 25% of the total value and, to a lesser extend, in the chemicals (about 22%) and construction materials (21% of the total value). The weight of textile and especially clothing are certainly under-estimated because number of operations is of low unitary value (less than 100,000 US\$) and figures are not available.

At the end of 1997, FDI in Bulgaria is mostly concentrated in the city of Sofia with about 41.1% of the total FDI value, followed by Barna (19.8%), the region of Sofia (11.3%) and Lovetch (8.39%).

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<sup>1</sup> Because of special conditions created by war, the other countries issued from SFRY are not referred here.

Table 1. Foreign direct investment in Bulgaria<sup>1</sup>

	End of 1992	1993	1994	1995	1996	1997	1998 <sup>2</sup>
Number of contracts	69	604	2276	1932	3308	1889	332
Cumulative	69	673	2949	4881	8189	10078	10410
Annual volume (US\$ mn)	34.4	102.4	210.9	162.6	256.4	636.2	477.9
Change over previous year (%)	..	198	106	-33	57	148	..
Annual volume via privatisation (US\$ mn)	34.4	22	134.2	26	76.4	421.4	167.7
Percentage of total volume	100	22	64	16	30	66	35
Change over previous year (%)	..	-78	190	-75	88	120	..
Cumulative volume (US\$ mn)	34.4	136.8	347.6	510.2	766.6	1402.8	1880.7
Index, 1992=100	100	398	1010	1483	2228	4078	5467
Average size per project (US\$ 000)							
Per annum	498.6	169.5	92.7	84.2	77.5	336.8	1439.4
Cumulative	498.6	203.3	117.9	104.5	93.6	139.2	180.6

Source: Foreign Investment Agency

Notes:

1. These figures correspond to the value of capital actually transferred and registered in the courts, plus investments from retained earnings of foreign-owned companies, plus (for 1997 and 1998) foreign direct (over 10 per cent of a company shares) and portfolio investment inflows via the capital market. The latter amounted to US\$ 22.7 million in 1997 and to US\$ 13.5 million in the first half of 1998. Due to revisions of foreign investment figures, there are some discrepancies between this table and Table 34 of the 1997 *OECD Economic Survey of Bulgaria*.

2. Preliminary.

The use of criteria of economic and institutional attractiveness seems to be sufficient to explain the totally low level of inward FDI in the context of systemic rupture and high uncertainty (Ferris & *al.*, 1994; Richet 1997). Though these criteria should be adapted and complemented appropriately in order to: firstly take into account the strategies and motives of firms which decide to locate production facilities in a less attractive and uncertain environment and secondly to be possible to determine their objectives (Rizopoulos, 1995 and 1997; Maroudas and Rizopoulos, 1995; Thimann and Thum, 1998). We can identify three major reasons motivating investment in Bulgaria:

- Market penetration, the creation of competitive "first mover" advantages, customers' delocalisation and the elevation of entry barriers. Relatively stable oligopolistic structure of a great part of activities (for Bulgaria, see Jones & Meurs, 1991) and the disappearance or the difficulties of local firms facilitate market share control strategies of the first movers. Indeed, "contestability" of local markets grows, but high concentration makes possible the immediate control of important market shares.

- Approaching to the neighbouring - larger but more risky - markets (e.g. Russia, Ukraine) as well as the other Balkan countries, thanks to the cultural and geographical proximity and to the traditional relations linking them.

- Strengthen competitive positions in Western markets through the exploitation of comparative advantages (access to know-how, raw materials, low production costs and re-exporting etc).

Market control and, to a lesser extend, expansion in other regional markets seem to be the dominant goals of FDI in Bulgaria during the first years of transition<sup>2</sup>. Meanwhile, a gradual shift has been

<sup>2</sup> However, it is possible that the very limited information concerning some simplest forms of a largest defined FDI (especially sub-contracting) leads to an underestimation of cost advantage oriented investment.

occurred, since 1996, in the structure and the motives of inward FDI in Bulgaria, as large Multinational Enterprises (MNEs) have started the establishment of distribution networks, which combine complementary productive activities. Particularly in 1997 inward FDI increased substantially to 636,1 US\$ million, while it has been observed a realisation of a certain number of significant investments, especially in activities where Bulgaria possesses strong comparative advantages or in sectors such as infrastructure and provision of public services (Boudier-Bensebaa and Rizopoulos, 1999).

## Conceptual Framework

A national market for a final product can be served by MNEs by three distinct modes: exports, contractual agreements and FDI (Buckley and Casson, 1993). Two critical distinctions can be used to separate these methods; the *Location effect (L)*: which separates the first model from the other two and the *Internalisation effect (I)*: which distinguishes the third mode. The *location effect* determines “where value adding activities take place” (in which sectors) and the internalisation effect determines ‘why MNEs engage in FDI rather than license or exports’. Export modes differ from the other two modes by the location effect: value-adding activities take place in another (not necessarily home) country, while the other two modes transfer much of the value-adding activity to the host country. In the case of FDI, the “investment is made outside the home country of the investing company, but inside the investing company. Control over the use of the resources transferred remains with the investor” (Dunning 1993: 5). Contractual agreements are not dealt in this study.

A selective presentation of the theories on FDI includes those that have emerged from the neo-classical trade theory, those that are based on the notion of “competitive advantage” [as developed by Hymer (1960) and Kindleberger (1969)] those derived by Coase’s interpretation of transaction costs and the “internalisation theory” (Buckley and Casson, 1976; Rugman, 1980) and finally the “eclectic paradigm” as advocated by Dunning (1981, 1993).

The eclectic paradigm incorporates internalisation theory and adds two other dimensions needed to explain the distribution of FDI and trade in a host country’s industrial sectors. A firm must have Ownership advantages (O), L as well as I advantages in order to supply a host country through FDI. O advantages determine ‘who is going to produce abroad’ and relate to technology, marketing and management skills or even expertise in the co-ordination of international activities. These advantages must be transferable overseas and must be more economically to be exploited abroad in combination with some host country L advantages. Consequently, L advantages relate to the host country and may for example refer to the existence of raw materials or other assets (e.g. cheap labour or technological expertise) not available in the home country. Also refer to advantages of the home country such as factor inputs, infrastructure not available in the host country. The firm takes additional advantages exploiting its O advantages in the host country by itself rather than by licensing them to an independent firm. In other words the firm internalise the use of those assets by replacing factor (licensing) and product (trade) markets.

Concerning the host country, the paradigm predicts that the configuration of OLI advantages will determine the inter-sectoral distribution of inward FDI and trade. In this perspective sectors will experience different internationalisation levels and modes depending on the types and levels of OLI advantages they encompass. A number of studies examine the determinants of distribution of inward FDI mainly in developed countries. The pioneering study of this type was that of Caves (1974) for Canada and UK, but see also the study of Lall and Siddharthan (1982) for the US and Liu (2000) for China]. It should be noticed that O, L and I characteristics are not readily observable or measurable and these studies have used a number of variables as proxies. Ownership advantages are represented by proxies for firm or sector level marketing intensity (e.g. the advertising/sales ratio) to represent the

marketing skills needed to compete in the industry, technical sophistication (e.g. R&D/sales ratio) and capital intensity. The usual hypothesis is that high levels of each of these proxies require the skills likely to be owned by MNEs. Locational advantages have been represented by economic variables such as market structure, tariff levels, input costs or skill levels or policy variables. Internalisation advantages are hard to measure and have usually been ignored.

While trade and FDI are presented here as alternatives, there are important elements of complementarity as well as substitutability among them as firms often use exports as a precursor to foreign production and the existence of foreign production facilities can lead to intra-firm trade, particularly in intermediate goods. The question of the extent to which trade and FDI substitute for each other has been explored by many studies, most of them based on L factors but few on O factors [Lipsey and Weis (1981), Malanoski et.al. (1995); Boudier-Bensebaa and Rizopoulos, (1999)]. Malanoski et.al., with access to ERS panel data for around 40 firms for 6 years, found that at the aggregate level there was ‘no support for the suggestion that exports and foreign production are substitute strategies’ (1995:12), though whether exports lead FDI or vice versa (or both are reinforcing) depends on both host country and firm characteristics. Lipsey and Weis (1984) found parent firm’s exports to the foreign market positively related to the firm’s manufacturing affiliate activity in the foreign market indicating the intra-firm nature of parent’s exports. Most of these studies are based their analysis at the firm level or their analysis relates to outward activities of firms and therefore it is easier to isolate and analyse with accuracy O and L factors. However, if the level of analysis relates to the host country, imports and inward foreign production may be originated from many source countries and we cannot take into account the ownership effect (i.e. FDI originated from different home countries). Therefore any inference of substitutability or complementarity of these modes may be ambitious. However, in the case of Bulgaria Boudier-Bensebaa and Rizopoulos (1999), using correlation analysis revealed a positive and statistically significant relationship between trade and FDI flows.

## Methodology and Econometric Model

If the O advantages of MNEs associated with their home location are taken as given, then, in line with the OLI paradigm, inter-industry variation in the level of inward FDI might be explained in differences in levels of L and I advantages, as well as industrial characteristics.

In our paper, the level of analysis is limited to manufacturing sectors within a single country, which should be more homogeneous in terms of history, policy impacts, etc. Also, by introducing a time-series it makes it easier to capture some systematic time elements relevant to such macroeconomic factors as interest and exchange rates or temporal variation of FDI inflows. Thirdly, by introducing sectoral dummies it is possible to capture unobservable differences due to systematic sectoral variation as mentioned above. The pooled data set has a total of 35 observations: 7 industrial sectors for a 5-year period (1993-1997).

The dependent variable used is the natural logarithm of flows of inward FDI in different sectors according to National Statistical Service of Bulgaria (NSSB). For a variable definition and sources see Table 2. However this variable is limited in the sense that there is a significant number of zero observations. The censored nature of the dependent variable demanded the use of the Tobit model<sup>3</sup>. The Tobit model implies a data generating process defined by a censored normal distribution, in which

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<sup>3</sup> Preliminary analysis showed the sensitive nature of the data in logistic transformations (such as the so-called log-odds ratio) and consequently the use of the Tobit model was chosen.

the variables have a lower bound of zero, which is observed in a number of cases. The stochastic model may be expressed in terms of a latent variable  $y_{it}^*$  in the following relationship:

$$y_{it}^* = \alpha_0 + X_{it} \beta + u_{it}$$

where

$$y_{it} = 0 \quad \text{if } y_{it}^* \leq 0$$

$$y_{it} = y_{it}^* \quad \text{if } y_{it}^* > 0$$

Vector  $X_{it}$ , represents sectoral location-specific explanatory variables and  $u_{it}$  the error term.

The determinants of distribution of inward FDI have therefore been estimated using this stochastic model. Da Silva (1996) used this latent variable in his study to express a measure of a country's potential investment capability (i.e. in cases where there is no FDI). Here the same argument is used for industrial sector investment potential and therefore to take into account the characteristics of sectors that do not attract FDI.

The independent variables capture L and I advantages. However, there may be difficulties in the isolation of variables which capture L and I advantages, since it is empirically difficult to discern where the L advantage ends and where the I advantage starts. This study uses four proxies<sup>4</sup> – in order to test hypotheses about the locational determinants of the structure of FDI: export-orientation, import-intensity, labour-intensity, and market size to capture unobservable differences in the level of locational L advantages.

The level of exports is often used as an indicator of a sector's degree of openness. There may be a two-way link between FDI and trade as hypothesised in previous studies. As a hypothesis related to this study, MNEs may engage in FDI in order to exploit export opportunities in the Bulgarian manufacturing, by taking L advantages of local natural endowments, cheap labour combined with regional characteristics - approaching to the neighbouring countries, thanks to cultural and geographical proximity and to the traditional relations linking them. It should therefore be expected that industrial sectors that have distinct L advantages and competencies related to this type of activity should accumulate FDI inflows. Therefore a positive relationship is expected between exports and FDI. However, in order to test whether exports lead to FDI or vice versa the EXPOS variable was instrumented by its one-year lagged values (EXPOS-1).

Foreign operations by MNEs still support imports, especially for finished goods from the parent company or trade-associated companies. However it would be anticipated that exports (i.e. host-country's sector imports) would be the first means of servicing the host market, with FDI emerging as soon as markets reach the conditions (e.g. stability) likely to permit efficient local production. As a hypothesis related to this study, there may be important elements of substitutability among imports and FDI. As in the previous case, the IMPOS variable was instrumented by its one-year lagged values (IMPOS-1).

Other things being equal, firms are expected to prefer lower wage locations. This is probably one the major location-specific advantage of countries from Eastern Europe. In addition, one should expect that industrial sectors characterised by this type of advantage are more likely to attract FDI. Most empirical studies use proxies such as wages per employees, and total wages over output to capture costs and skills and labour intensity respectively.

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<sup>4</sup> Where data are available for all sectors for the period studied.

Given the availability of data this study uses labour costs (LABINT). As a hypothesis related to Bulgaria, it should be expected that, the more labour intensive sector, the more FDI it receives. Therefore a positive relationship between LABINT is expected.

The size and characteristics of the host and adjacent markets is one of the most powerful L-specific variable influencing the industrial composition of FDI. Generally it would be expected that the larger a host sector's market the larger the FDI it receives. Most studies have found this variable to be positively related and significantly associated with inward FDI. In terms of our independent variable this would indicate a sustained positive relationship between domestic sales (DSALES), proxied by industrial sector's output, and FDI.

A number of other potential proxies were considered or tried and dismissed. Tax rates and tariffs do not vary substantially across sectors and thus were not considered as important. Concentration ratios are sometimes considered relevant as high levels of concentration may attract firms interested in monopoly rents, or may act as entry barriers, but data were not available to calculate these. Finally, market growth was fitted as a possible indicator of market attractiveness, but coefficients were insignificant and therefore have been excluded in order to have more degrees of freedom.

*Table 2. Variable definitions and sources*

Variable	Definition	Source
FDI	The natural logarithm of flows of inward FDI value of a sector.	FIAB*
Export orientation (EXPOS)	The ratio of exports to total output value of a sector.	NSSB
Export orientation (-1) (EXPOS-1)	The above-mentioned variable instrumented by its one-year lagged values.	NSSB
Import intensity (IMPOS)	The ratio of imports to total output value of a sector.	NSSB
Import intensity (-1) (IMPOS-1)	The above-mentioned variable instrumented by its one-year lagged values.	NSSB
Labour-intensity (LABINT)	The ratio of expenditure for salaries and wages per 100 levs production of a sector.	NSSB
Domestic Sales (DSALES)	The natural logarithm of the domestic sales value of a sector.	NSSB

\* see abbreviations in appendix

The pooled data set has a total of 35 observations: 7 two-digit sectors for a five-year period (1993-1997). The data matrix did not present any particular problems for the estimation of the regression coefficients. The correlation analysis (Table 3) showed no significant correlation among the explanatory variables. The inclusion of sector and year dummies was tested constructing the Wald Statistic (WS) (see Greene, 1993)<sup>5</sup>. The Wald test supports the use of each set of dummy variables as well as a group (year and subsector).

*Table 3. Correlation Matrix of Variables*

	FDI	EXPOS	EXPOS-1	IMPOS	IMPOS-1	LABINT	DSALES
FDI	1.00000	0.59665	0.14946	0.21678	-0.5475	0.5637	0.65959
EXPOS	0.59665	1.00000	0.28687	0.54661	0.11813	0.14042	0.37059
EXPOS1	0.14946	0.28687	1.00000	0.17334	0.65556	0.26116	0.53030
IMPOS	0.21678	0.54661	0.17334	1.00000	0.53053	0.45344	0.10024
IMPOS1	-0.5475	0.11813	0.65556	0.53053	1.00000	0.46674	0.37930
LABINT	0.5637	0.14042	0.26116	0.45344	0.46674	1.00000	-0.0804

<sup>5</sup> This test calculates a statistic derived from the restricted and unrestricted models (equivalent to F test).

DSALES	0.65959	0.37059	0.53030	0.10024	0.37930	-0.08046	1.00000
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*Table 4. Regression equation explaining inter-sectoral variation in inward FDI*

Explanatory variables	coefficient (t-statistic)
Constant+	-0.289D-2 (-4.920)***
Export-orientation	0.104D-2 (3.091)***
Export-orientation (-1)	-0.241D-3 (-0.479)
Import-intensity	0.100D-3 (0.450)
Import-intensity (-1)	-0.241D-3 (-1.437)
Labour-intensity	0.868D-4 (2.971)***
Domestic sales	0.176D-4 (6.268)***
Food drink and tobacco	0.464D-3 (3.004)***
Machine building and equipment	-0.652D-3 (-2.102)*
Press printing	0.373D-4 (0.172)
Electrical and electronic appliances	-0.260D-3 (-1.276)
Wood and furniture	-0.155D-3 (-0.824)
Textile and clothing	-0.926D-4 (0.822)
$R_{yy}^{\wedge}$	0.98
N	35

$R_{yy}^{\wedge}$  : squared correlation between the predicted and the actual values. **N**: the number of observations. +the dummy for 1993 and the chemicals and pharmaceuticals sector have been incorporated into the constant. In the notation D-X; X is the number of 0 to be inserted after the decimal point. Figures in parentheses are t-values. Superscripts indicate levels of significance as follows: \*\*\* 1 per cent, \*\* 5 per cent, \* 10 per cent.

## Locational-determinants

Table 4 presents the results of the regression analysis. Estimation of each equation was undertaken in the presence of moderate multicollinearity. The squared correlation between the predicted and actual values of the dependent variables<sup>6</sup> is 0.98. Export orientation as proxied by EXPOS is an important determinant of inward FDI in the Bulgarian manufacturing. The parameter estimate for EXPOS in explaining FDIOS is positive and statistically significant (at the 1 per cent level one-tailed test). This result suggests that MNEs are attracted to industrial sectors that in the future may use as export platforms. The EXPOS-1 is not different from zero confirming the previous statement. The parameter estimates for import intensity (IMPOS) is not significant but IMPOS-1 is negative indicating a substitution effect (though statistically insignificant).

The parameter estimates for labour intensity in explaining FDI is positive and statistically significant (at the 5 per cent level one-tailed test). This result confirms that FDI occurs mainly in labour intensive sectors of Bulgarian manufacturing. Of course there may be some other more qualitative aspects of

<sup>6</sup>  $R_{yy}^{\wedge}$  is an indicator of fit of the regression similar to  $R^2$ .

labour, which maybe need to invest further. The parameter estimate for DSALES is highly significant (1 per cent level, one-tailed test).

Relative to chemicals and pharmaceuticals sector (the omitted dummy), one sector, food drink and tobacco, have a highly significant positive impact on FDI (1 per cent level). The machine building and equipment sector has received significantly (10 per cent level) less FDI than would be suggested by the other (economic) explanatory variables.

## Conclusion

The nature of FDI inflows in Bulgaria change during the second half of the nineties. Although until 1995/96, first-mover advantages and market seeking investments seem predominant according to the existing literature, privatisation and relative stabilisation have induced some major FDI projects, motivated by the Bulgarian revealed comparative advantages.

Regression analysis for the period 1993/97 indicates that FDI occurs in export and labour intensity activities, which probably coincide with internalisation and some ownership unobservable advantages. These results seem to confirm theoretical expectations and so the model can be considered to provide a good explanation of the path of internationalisation of the Bulgarian manufacturing.

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## **Appendix**

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### Description of industrial sectors

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Chemicals, pharmaceuticals, and plastics  
 Manufacture of food, beverages and tobacco  
 Machine building and metal working industry  
 Press printing industry  
 Electrical and electronic industry  
 Logging and manufacture of wood and wood products  
 Manufacture of textile and knitwear

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