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ENTRY, EXIT AND PROFITABILITY[xx]

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INTRODUCTION

Businessmen and researchers agree that the relationship between industrial performance and market structure and conduct may be influenced by the "entry" and "exit" features of the sectors. Moreover, government "industrial" policy in European countries effects not only entry through investment incentives but also exit through subsidies.

Most studies however linking profit with structural industry characteristics treated entry and exit separately (Duetsch, 1975; Orr, 1974; Qualles, 1972; Harrigan,1981). Only very recent research indicates a link between barriers to entry and barriers to exit (Caves and Porter, 1976; Eaton and Lipsey, 1980).

It seems therefore worthwhile to explore the simultaneous effect of entry and exit on profitability. Our study seems to suggest that there exist significant profitability differences between "high entry - high exit", "low entry - low exit" and "high entry - low exit" industries for Belgium.

1. THEORETICAL AND EMPIRICAL BACKGROUND

a. Entry barriers, entry, concentration, risk and profitability

There is a voluminous literature on barriers to entry (cfr. Scherer, 1980, for a review). Although economists often expect a strong positive relation-ship between entry barriers and long-run average profit rates (e.g. Mann, 1966 and Bain, 1972), the a-priori expected relationship between measured profit rates and entry barriers remains ambiguous.

Scherer (1980) gives an excellent review of the relationship between entry barriers, concentration, and profitability. Concentration may be conducive to collusion, high prices and high profits, but unless there are appreciable barriers to entry, the profits will attract new entrants and the collusion will be undermined sooner or later. Factors like limit pricing, predatory pricing, uncertainty, entry lags etc... make this relationship however obscure (e.g. De Bondt, 1976; Lippman, 1980).

Empirical evidence (e.g. Orr, 1974) in the U.S. and Canadian manufacturing in-dustries shows substantially higher rates of return for the 'very high barriers' group than the 'substantial barriers' class. It was also found that entry barriers exert a significant influence on profitability independent of concen-tration (Orr, 1974; Qualls, 1972). For Belgium, Vanlommel and De Brabander (1976) conclude that there is a rather small correlation between profitability and some measures of barriers to entry.

Other studies focus on entry instead of entry barriers (Nakao, 1980; Orr, 1974; Lane, 1980; Gorecki, 1975; Duetsch, 1975). It is theoretically shown that pro-fits per firm fall as entry into stable equilibria takes place (Seade, 1980). Scherer (1980) states that "the systematic statistical evidence on variables positively associated with new entry is sparse and somewhat contradictory.

There are indications that the rate of entry is higher when preentry profits are ample, when concentration is high, and perhaps especially when demand is growing rapidly". Most studies (e.g. Orr, 1974) also find that higher barriers to entry result in lower entry. Bain is suggesting a queue of potential entrants ranked by the rate of return each newcomer expects to earn. The other members of the queue of the potential entrants and their likely behavior affect the entry decision. Caves & Porter (1977) describe a list of factors, like the incumbents expected reactions to entry, affecting the entry decisions.

b. Exit barriers and exit

For a long time, the study of exit barriers and exit was very scarce, as reflected in the opinion of Bain (1972) : "A systematic relation of conditions of exit to monopoly is not obvious, and if it exists it is probably of secondary importance ..."

In Porter (1976) and Caves and Porter (1976) we find an excellent description of the different barriers to exit :

a. Structural exit barriers due to the durability and specifity of the assets. E.g. the more specific the assets are, the lower the recovery value the firm can expect to recieve.
b. Corporate strategy exit barriers due to interrelatedness. E.g. the more complementary or linked the business is to other businesses in the company, the higher the barriers to exit.
c. Managerial exit barriers due to conflicting goals and the absence of appropriate financial or accounting information. E.g. there are reasons why managers may avoid exiting from a business even when the economies suggest they should ("who wants a loser").

While a. and b. barriers are characteristics of firms which make it in the companies' best interest to stay even though they are earning a rate that is

below the cost of capital, the c. barriers deter management from making de-
cisions to exit even though they are justified on economic grounds.
Harrigan (1981) and Coldwell explain why expectations (e.g. with respect to
expected market growth) may be another group of exit barriers.
Caves and Porter (1976) set forward a hypothesis about how exit barriers in-
fluence collusion and market conduct. A firm with many durable and specific
assets faces an increased variability of profits (cfr. the relation between
operating leverage and risk as explained in Lev (1974)); so exit barriers
enlarge the variability of profits and the maximum size of losses. They and
Harrigan (1981) also test that higher exit barriers should mean that firms
exit from an activity less often.

2. TOWARDS A UNIFIED TREATMENT OF ENTRY AND EXIT TO EXPLAIN PROFITABILITY

a. The interrelationship between the entry and exit decision

Caves & Porter (1976) describe a list of elements affecting the entry decision.
Although some aspects of the entry and exit decisions are clearly different
(e.g. "...a divestiture is an expression of failure (Hayes (1972)); some dif-
ferent legal aspects) one can show that both decisions are strongly interre-
lated.

In the literature one finds a few analytical derived indications of this link.
One insight is that the number of firms which can coexist in a differentiated
industry cannot exceed a finite value (n^x). If more than n^x firms try to re-
main in the market, a struggle will provoke the exit of one of them (Jaskold
& Gabszewiez, 1980). Inaba (1978) shows that barriers to entry and exit retard
convergence to long-run equilibrium.

Exploring now further the elements suggesting a relation between entry and exit.

A first factor is that many barriers to entry are barriers to exit too.
Caves & Porter (1976), Eaton and Lipsey (1980) and Harrigan (1981) argue that
technological or structural factors that impede entry are likely to impede
exit as well. The actions that going firms can take to deter entry also
prolonge their own departure from the market. Substantial investments a firm
made in automated processes, in specific resources, in goodwill etc... are a
form of entry barrier which later constitute "exit barriers". A possible ob-
jective of creating entry barriers is the fear for exit, and the higher the
existing barriers to exit the lower the need for entry barriers. If there are
high barriers to exit depending on one's risk aversion, it may be worthwhile
to try to enter, even if there are high entry barriers.

A second element are the conjectures by potential entrants and leavers. For
entrants, those conjectures are not only about the potential economic profit,
the other members of the queue of potential entrants and their likely behavior
but also about the queue of potential leavers (exit) affecting again the future
rents one can earn, and even conjectures about one's own exit. Harrigan (1981)
even is suggesting that "firms will want to plan their exits at the time of
entry into a business, given   short life cycles for new products". Reasón-
ing in an analog way with respect to the exit decision, one may say that a
queue of potential entrants and leavers influence the exit decision too.

A third element indicating the entry-exit relationship is the fact of predatory
pricing : "predation is a response to entry that sacrifices part of the profit
that could be earned were the entrant to remain viable, in order to induce exit
and gain consequent additional monopoly profits" (Or dover and Willig, 1979).
It is however also possible that the incumbent is the object of predation : the
entrant may select a pricing and marketing plan so unfavorable to the incumbent
that the incumbent's best response is to exit from the industry. (Ordover &
Willig, 1979).

From the previous analysis it is not a priori clear how the relationship is
between entry and exit in an industry :

1. If high (low) barriers to entry are high (low) barriers to exit too, we
   expect that sectors with low entry (due to high barriers) are characterized
   by low exit too.
2. High barriers to exit may be an incentive to make a lot of investments
   leading to entry (even if their are high entry barriers). This would result
   in industries with low exit and high entry.
3. If each potential entrant or leaver expects many other potential entrants or
   leavers it is difficult to predict the real entry and exit, depending (among
   other things) on their risk attitude. High exit f.i. can be an incentive to
   exit but also a barrier to exit.
4. Whereas limit pricing seems to lead to low entry and low exit, predatory
   pricing may result in high exit.
5. What will be the combined effect of the previous and other relevant factors
   not discussed (e.g. entry and exit lags) ?

b. "Entry-Exit" and profitability

Because entry and exit decisions are interrelated, it seems worthwhile to ex-
plore the simultaneous effect of entry and exit on profitability. We therefore
classify the industries as "low entry - low exit"-industries; "high entry -
high exit" industries; and "high entry - low exit". The "low entry - high exit"
case is impossible, studying the sectors over a relatively long time-period.

Industries of the "low entry - low exit" group are expected to be of high con-
centration, relatively less risky (stable), high barriers to entry and exit
or high investments to create those barriers. Most of those factors create a
very profitable situation.

Industries of "high entry - high exit" group are (because of reverse arguments)
characterized by low profitability.

Industries of the "high entry -low exit group" are characterized by low con-
centration, low barriers to entry, and high barriers to exit (structural or
not). There are reasons to expect the lowest profitability here e.g., be-
cause a firm cannot leave easily the sector even if making losses during a
long period.

II. EMPIRICAL EVIDENCE

1. Justification and definition of the variables used

a. Entry

We detect entry as the average number of new firms (n) over a ten year period
(1966-1975). Most of the analysis is restricted to corporations and partner-
ships partially limited by shares. Because of lack of data our approach is
different from Caves & Porter's analysis of mobility (1977), considering di-
versification of existing firms as entry too. Referring to Orr (1974) de-
fining entry when there is an increase in the number of firms in the industry,
we prefer our measure not being influenced by exit or mergers. For some in-
dustries (e.g. textile industry, building) the average new entry is four times
the "Orr-entry" measure. With regard to the degree of entry, the sample was
divided into groups ("high entry" and "low entry") the demarcation being an
average number of entering firms more than 20. As Duchesneau (1974) is suggest-
ing we consider only two classifications of entry.

b. Exit

Exit is defined as the average number of firms leaving the industry (over the
same time period as entry). The x data however include liquidations and
mergers, as officially reported in "Het Belgisch Staatsblad". The results must
be interpreted with this possible misspecification of exit, in mind. For de-
fining "high exit" and "low exit" the same procedure is followed as for the
entry case.

c. Profitability

Scherer (1980) discusses several different measures of profitability. In this study an accounting profit rate, a market rate of return and an economic profit rate are used.

One of the most interesting accounting measures is the rate of return on common stock equity, defined as $\bar{A} = \dfrac{\text{net income}}{\text{stockholders equity}}$, because this ratio tells us the earning power on shareholders' book investment (cfr. Orr's measure : $\dfrac{\text{net income} + \text{interest payments}}{\text{total assets}}$).

By averaging the raw data over a rather long period, we try to minimize the arbitrary element in the accounting rate (Scherer, 1980), due to depreciation and the treatment of advertising and R&D outlays (see Demsetz, 1979).

The market rate of return used is based on the Capital Asset Pricing Model (CAPM) (see.e.g. Fama & Miller, 1972) :

$$\bar{B} = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$$ where P_t = price of stock at time t,
D_t = dividend paid during period t.

Economic theory (e.g. Coldwell, 1980) however explains entry and exit on excess rates of return or economic profit. Qualls (1972) is using excess profit rates on sales. For each firm, equity at the beginning of the year is multiplied by six per cent, assumed to be a 'normal rate of return'. He subtracts this from after tax income and expresses the remainder as a percentage of net sales revenue. The author agrees that risk aversion attitudes of investors would require different 'normal' rates for different industries of different degrees of risk. Rather recently some authors (e.g. Bothwel & Keeler (1976) and Bothwell (1980)) define the economic profit rate based on the CAPM, resulting in a different risk measure (β) for each industry. (see e.g. Fabozzi and Francis, 1979; Gheysens and Regidor and Vanthienen, 1978). The economic profit rate ($\bar{E}$) is found by subtracting the required rate of return (or cost of capital as defined by the CAPM) from the market rate of return ($\bar{B}$).

d. Concentration and risk

Concentration has been studied in Belgium several times (see Phlips, 1971;
Jacquemin ..., 1978; Vanlommel ... 1977). We select the C4 ratio as a measure
of concentration. High concentration is equated with a four-firm concentra-
tion ratio greater or equal to 50 per cent (see Jacquemin, 1978). Previous
studies (e.g. Mann, 1966; Orr, 1974) about American and Canadian industries
were indicating high concentration by an eight-firm concentration ratio equal
to or greater than 70 per cent.

Risk is measured by the Beta-coefficient of the industries (Fabozzi and Francis,
1979, Bothwell (1980); Bothwell & Keeler (1976); Scherer, (1980) etc...).
High risk means a Beta greater than one; low risk less than one.

e. Entry nominal capital

For all studied industries the average nominal capital as of the date of entry
was computed.

2. The Results

a. The exit-entry link

For Belgium, we find a very strong association between entry and exit (cfr.
Table 1). The Spearman's rank correlation coefficient is 0.86, being very
significant. All "high exit"-industries belong to the "high entry" group too.
All "low entry"-industries are also "low exit" sectors. There are only three
sectors (building, chemicals, paper and printing) in our sample belonging to
the "low exit" and "high entry" case.

This correspondence between entry and exit may be explained by the fact that
most barriers to entry are barriers to exit too. The "low entry-low exit"

combination consisting of sectors as banking, electricity, insurance, glas and cement, is characterized by many "legal" barriers to entry and exit ("protected" industries). Moreover, those sectors are rather specialized, and use very durable assets (electricity, glas, cement).

Concentrating on exit alone, our results seem to confirm Harrigan (1981) concluding that firms to be of relatively 'high strategic' importance were also less likely to be divested. 'Commodity-like' products producing firms were most likely to exit.

Chemicals and building are characterized by rather durable and specific assets; so one may expect to exist in these sectors high barriers to exit. The high entry during the period studied may perhaps be explained by a growing demand (cfr. Scherer, 1980).

Considering the limited liability companies, the results indicate an even stronger association between entry and exit.

b. Entry, exit and profitability

Considering entry and exit seperately with respect to their relationship with profitability, we find a great difference for all profitability measures between "high entry" and "low entry", supporting the hypothesis of a positive relationship between low entry (or high entry barriers) and average profitability. Computations of the spearman's rank correlation coefficient yield negative (but insignificant) associations too.

Considerable average profitability differences arise between "high exit" and low exit" only for the accounting profit rate. Possible reasons of no difference with respect to the market or economic profit rates are the interventions of government and social groups in the exit decision, while the entry decision is made autonomously by the owners. From this point of view, one could say that it is more difficult to leave than to enter.

TABLE 1 : Average exit and entry of the Belgian industries (66-'75)

I. Corporations and Partnerships partially limited by shares

High exit industries (n > 20) average ('66-'75)		High entry industries (n > 20) average ('66-'75)	
wholesale and retail	153.5	wholesale and retail	431.1
financial and real estate	47.4	manuf. of metal art.	87.3
man. of metal art.	42.2	building	73.1
textile	25	transportation	72.8
transportation	23.3	financial and real estate	70.1
food	22.5	paper and printing	31.8
		food	30.6
		chemical	25.1
		textile	22.5

Low exit industries (n < 20)		Low entry industries (n < 20)	
building	16.4	cement	8.4
chemicals	13.7	insurance	4.7
paper and printing	8.5	banking	1.7
cement	4.5	glass	1.6
insurance	2.4	electricity	0.5
banking	1.9		
glass	1.8		
electricity	1.4		

II. Limited liability companies

wholesale and retail	372.8	1155.6
building	65.7	313.4
transportation	49.4	209.7
manuf.of metal art.	45.8	116
textile	32.2	46.6
food	27.9	50.7

Source : The raw data were taken from the "Belgisch Statistisch Jaarboek".

However if we compare the "low entry-low exit industries" with the "high exit - high entry industries", the profitability differences are again significant for all profitability measures. The average profitability of the "low exit - high entry" group is respectively 7.9, 2.6, -8. For this group we find the lowest economic profit rate, the lowest market rate but a better accounting rate than the "high entry - high exit" case.

c. Entry, exit and concentration

All studied Belgian industries of high concentration belong to the "low entry - low exit" category, confirming Swiggers (1978) who concluded that high concentration and high entry barriers go together; and all "high entry - high exit" sectors are characterized by low concentration. Moreover none sector could be found being of low concentration, and belonging to the "low exit - low entry" group (see table 3).
We did find some empirical evidence for Caves & Porter's (1976) hypothesis that exit barriers restricting the outflow of firms and deterring the elevation of entry barriers reduce concentration : the existence of the "low exit - high entry" group, all belonging to the low concentration industries.

d. Entry, exit, concentration and profitability

Highest profitability is found for industries of high concentration, low entry and low exit; the poorest accounting return for low concentration, high entry and high exit. Based on market and economic profit rates, low concentration - high entry - low exit was worst; those rates seem to reflect the future high exit difficulties (e.g. due to high barriers).

Analyzing more industries, we use Orr's measure of entry; he detects entry when there is an increase in the number of firms in the industry. Over a ten year period it is defined as

TABLE 2 : Entry, Exit and Profitability of the Belgian industries ('66-'75)

High entry industries	$\bar{A}$(a)	$\bar{B}$(b)	$\bar{E}$(c)	High exit industries	$\bar{A}$(a)	$\bar{B}$(b)	$\bar{E}$(c)
wholesale and retail	-	-	-	wholesale and retail	-	-	-
manufacture of metal articles	7.3	4.8	- 6.8	manufacture of metal articles	7.3	4.8	- 6.8
building	9.9	5.6	- 5				
transportation	2.6	10.7	0.7	transportation	2.6	10.7	0.7
financial and real estate	6.6	-	-	financial and real estate	6.6	-	-
paper and printing	6.1	-7.7	-18.5				
food	6.8	8.8	- 2.7	food	6.8	8.8	- 2.7
chemical	7.8	9.9	- 0.8				
textile	2.9	3.6	- 7.9	textile	2.9	3.6	- 7.9
class average	6.25	5.1	- 5.8	class average	5.2	6.9	- 4.1

Low entry industries	$\bar{A}$(a)	$\bar{B}$(b)	$\bar{E}$(c)	Low exit industries	$\bar{A}$(a)	$\bar{B}$(b)	$\bar{E}$(c)
cement	8.5	-	-	building	9.9	5.6	- 5
insurance	13.9	18.2	7.4	chemicals	7.8	9.9	- 0.8
banking	11.4	8.0	-2.9	paper and printing	6.1	-7.7	-18.5
glass	6.9	6.3	-4.9	cement	8.5	-	-
electricity	8.7	7.0	-4.2	insurance	13.9	18.2	7.4
class average	9.88	9.9	-1.1	banking	11.4	8.1	-2.9
				glass	6.9	6.3	-4.9
				electricity	8.7	7	-4.2
				class average	9.1	6.7	-4.1

(a) $\bar{A}$ = Average Accounting Rate; Based on the "Belgische economie in 19..".

(b) $\bar{B}$ = Average Market Rate; Based on L. Gheysens and B. Regidor and L. Vanthienen (1979).

(c) $\bar{E}$ = Average Economic Profit Rate.

TABLE 3 : <u>Entry, Exit, Concentration[a] and Profitability</u>

<u>Industries of high concentration</u>	$\bar{A}$	$\bar{B}$	$\bar{E}$	β(c)
<u>High entry & High exit</u>				
-				
<u>Low entry & Low exit</u>				
- electricity	8.7			0.98
- cement	8.5			-
- glass	6.9			0.99
- banking (b)	11.4			0.94
- insurance (b)	13.9			0.90
class average	9.8	9.9	-1.1	
<u>Industries of low concentration</u>				
<u>High entry & High exit</u>				
- food	6.8	8.8	-2.7	1.06
- textile	2.9	3.6	-7.9	1.05
- manufacture of metal articles	7.3	4.8	-6.8	0.93
class average	5.6	5.7	-5.8	
<u>Low exit & High entry</u>				
- chemicals	7.8	9.9	-0.8	0.87
- building	9.9	5.6	-5	0.86
- paper and printing	6.1	-7.7	-18.5	0.90
class average	7.9	2.6	-8	
<u>Low exit & Low entry</u>				
-				

(a) Based on A. Jacquemin and E. de Ghellinck andC. Huveneers (1978); E. Van-
  lommel and B. De Brabander and D. Liebaers (1977)

(b) The concentration data were derived from "Trends". For the banking sector,
  we used the deposits and for insurance, the premiums of the year 1979.

(c) Based on L. Gheysens and B. Regidor and L. Vanthienen (1979).

$$\text{Orr's entry} = \frac{1}{10} \sum_{1966}^{1975} c_{it} - c_{i(t-1)}$$

where c_{it} = number of firms in the ith industry in the tth year

$c_{it} - c_{i(t-1)}$ is defined as ≥ 0.

Orr's measure may be an underestimate due to exit. For sectors studied by this methodology we use therefore the criterium $n < 10$ to decide wether an industry belongs to the low entry group or not.

This extension of the sample yields the following interesting result (cfr. table 4) : the influence of entry on profitability depends on the degree of concentration, and the impact of concentration on profitability depends on entry too. Low entry industries are characterized by high profitability if they are highly concentrated and yield a poor return in the other case.

e. Risk and profitability

In table 3 the Beta coefficients of the industries are given in the last column. Because these coefficients are measured based on market data, the only useful profitability data are the market or economic profit rate. A Beta more than one means a highly risky industry; $\beta < 1$ indicates low risk. Industries of the high entry-high exit group (all belonging to low concentration in our sample) show the highest risk. High entry and high exit means that the external organisation and the competitive situation change frequently. The absolute value of the sum of the number of firms' entering and leaving would be a measure of (in)-stability of the sector (cfr. Duchesneau, 1974). The low exit-high entry group has the lowest average industry Beta.

TABLE 5 : Entry, Exit and entry nominal capital

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High entry & high exit industries	average nominal capital (a)
- financial and real estate	25.2
- food	11
- textile	10.7
- manuf. of metal art.	13
- wholesale and retail	2
- transportation	5.7
class average	11.2

Low entry & low exit industries	
- cement	8.1
- insurance	18.7
- banking	239
- glass	26
- electricity	35
class average	65

II. A comparison of average nominal capital between Corperations (C&P) and Limited Liability Companies (L.L.C.)

common industries in the sample	L.L.C.			C&P		
	av.exit	av.entry	av.nom.cap.	av.exit	av.entry	av.nom.cap
wholesale and retail	372.8	1155.6	0.4	153.5	431.1	2
man. of metal.articles	45.8	116	0.8	42.2	87.3	13
textile	32.2	46.6	1.1	25	22.5	10.7
food	27.9	50.7	1.1	22.5	30.6	11
building	65.7	313.4	0.7	16.4	73.1	3.4
transportation	49.4	209.7	0.4	23.3	73.8	5.7
class average			0.7			7.6

(a) in million BF.

Source : The raw data were taken from the "Belgisch Statistisch Jaarboek".

Another insight is the need for modification of the CAPM-result (Famma &
Miller, 1973) too, stating that on the average there is a (linear) positive
relationship between risk (β) and return. We find that high concentration
(low entry-low exit) with a lower average β has a better return than more
risky industries (cfr. Fabozzi & Francis, 1979 introducing industry variables
to explain Beta-differences). This seems to be some empirical evidence for the
result of our recent paper (Van Herck, 1982) that a greater risk implies a
smaller influence of concentration on profitability or vice versa higher con-
centration implies risk has a smaller impact upon profitability. (compare
low entry-low exit with high entry-high exit in table 3).

f. Entry, exit and average entry nominal capital

The average entry nominal capital of the high entry-high exit industries is
much lower (11.2 million BF) then of the low entry-low exit industries (65.3
million BF). If we compare the number of entrants being corporations with those
being limited liability companies, it seems to be that the higher minimum re-
quired nominal capital for the former acts as a barrier to entry. The data how-
ever indicate that this entry barrier may be an exit barrier too. (cfr.
Ooghe, ... (1981) , who concludes that 70 % of failed business firms have an
entry nominal capital less than 500,000 BF).

CONCLUSIONS

In this paper, the simultaneous effect of entry and exit on profitability has been studied. Arguments are set forward suggesting the interrelationship between the entry and exit decisions : e.g. many barriers to entry are barriers to exit too ; both entry and exit decisions are influenced by a queue of potential leavers and entrants, predatory pricing, etc... .

The results for Belgium seems to suggest that
1. there is a strong positive association between average entry and average exit;
2. high entry - high exit industries are highly risky, are of low concentration and show the lowest accounting profitability;
3. sectors with low entry and low exit may be expected to belong to the high concentration group and perform very well;
4. high barriers to exit may be an incentive to enter, resulting in "low-exit, high entry" industries, characterized by low concentration and showing the lowest risk and market profitability;
5. the influence of concentration on profitability depends on the degree of entry and risk. High concentration with a lower β results in a better return than riskier industries.
6. the entry nominal capital seems to be a barrier to exit too.

We hope this study will be an invitation to some analytical and econometric research about the entry - exit relationship and its influence on profitability.

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