

Barriers to the entry into the fruit producing industry in the Czech Republic

Bariéry vstupu do odvětví ovocnářství v České republice

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Abstract: The contribution is focused on the analysis of barriers to the entry into fruit production. The branch is identified as a fruit growers branch and the threat to new entries in the branch will concern especially the establishment of a new firm or the expansion of an existing firm's plant production by some fruit species production. The methodology is based on the Porter model of competitive forces in the industry. In fruit production, there have been analysed the following entry barriers: economies of scale, differentiations, capital intensity, transfer, access to distribution channels, cost disadvantage independent of scale, government policy, anticipated retaliatory measures from existing firms. The analysis proves that the barriers to enter the fruit production are rather high nowadays, which should discourage the potential new firms from entering this branch.

Key words: branch, barrier to entry, fruit production, economies of scale, capital intensity, access to distribution channels, government policy, anticipated retaliatory measures from existing firms

Abstrakt: Příspěvek je zaměřen na analýzu bariér vstupu do odvětví produkce ovoce. Toto odvětví je identifikováno jako odvětví pěstitelů ovoce a hrozba nových vstupů v tomto odvětví bude spočívat především v možnosti založení nové firmy nebo rozšíření rostlinné výroby již stávající firmy o pěstování některého druhu (druhů) ovoce. Metodický přístup je založen na Porterově modelu hybných sil v odvětví. V odvětví produkce ovoce byly analyzovány tyto bariéry vstupu: úspory z rozsahu, diferenciacie, kapitálová náročnost, přechodové, přístup k distribučním kanálům, nákladové znevýhodnění nezávislé na rozsahu, vládní politika, očekávaná odvetná opatření ze strany stávajících firem. Na základě provedené analýzy lze konstatovat, že v současnosti jsou bariéry vstupu do odvětví produkce ovoce poměrně vysoké, což by mělo odradit potenciální nové firmy před vstupem do tohoto odvětví.

Klíčová slova: odvětví, bariéra vstupu, produkce ovoce, úspory z rozsahu, kapitálová náročnost, přístup k distribučním kanálům, vládní politika, očekávaná odvetná opatření ze strany stávajících firem

The key task of fruit production is to grow, store and supply fruit in the sufficient amount and quality to satisfy the customers' needs. Besides, fruit growing is a renewable resource of wealth, it helps sustainable development in the country, and it supports tourism and participates in landscaping.

In the Czech Republic, the traditional fruit production is based on growing fruit in the original country gardens and tree-lined roads. However, this production falls and its importance from the economic point of view is supposed to be irrelevant by 2010 (Blažek 2001).

In 2007, 17 856 ha of production orchards were registered in the Czech Republic, out of which amount the fertile planting covers 91.5% of the area (www.mze.cz). The entry barriers are the obstacles which prevent new competitors from doing business; they have been introduced as an effort to gain competitive advantages. The reason for introducing entry barriers is to discourage new potential competitors from establishing new firms. One possibility is to set costs of the market entry so high that the potential new firms risk negative return on capital which has to be invested (Karlöf, Lövingsson 2006).

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The contribution continues from the preceding work of the author dealing with fruit production (Kudová 2005, 2006; Kudová, Chládková 2007), Žufan and Pyšný (2005) worked at the application of the Porter model of competitive forces to other branches. The contribution is included in the research plan implementation at the Faculty of Business and Economics, the Mendel University of Agriculture and Forestry in Brno MSM 6215648904.

The aim of the contribution is to analyse the effect of the entry barriers which are theoretically described by Porter in fruit producing industry in Czech Republic.

MATERIALS AND METHODS

Comparing the relations between the existing firms doing business in the branch and potential competitors entering the branch, it is advisable – according to the Porter analysis – to assess especially the barriers which prevent new firms from entering the branch. The contribution identifies the industry as the fruit growing industry and the threat to new entries in the branch is based on the possibility to establish a new firm or to expand plant production of the existing firm by some fruit species.

The methodology is based on the Porter model (Porter 1994) of competitive forces in the industry, especially on the identification of entry barriers. The following entry barriers have been analysed in fruit production: economies of scale, differentiation, capital intensity, and transfer, access to distribution channels, and cost disadvantage independent of scale, government policy and anticipated retaliatory measures from existing firms. Among the entry barriers, there is also the so-called intangible entry barrier represented by the experience of owners or employees.

The monitoring time period is from 2000 to 2007, the entry data were drawn from the desk research, namely the Internet, and professional literature. The obtained data were processed by analysis, synthesis and induction.

RESULTS AND DISCUSSION

The number of competitors is the factor affecting profitability of any industry. The number depends on the passable entry in the branch and the possibility to compete with the existing firms. Barriers to entry are factors which prevent the entry into any branch. If they are low, the threat of new competitors' entry is high. It can result in a higher competition inten-

sity and the total profit, which any participant could reach, can be lower (Žufan, Pyšný 2005).

Analysis of entry barriers:

Economies of scale

Sharing activities with other department – savings can be gained in cooperation with other departments of plant production. Return of investments in mechanization is only possible if it is used to its full capacity, i.e. the production of species with different agro technical periods.

Joint costs activities – sharing costs of purchase and operation of mechanization, purchase of fertilizers and chemical protective aids and the cost of the qualification of employees and corporate management should be adequate to its size.

Cost decreasing – on establishing a new orchard, an intensive production should be taken into account because a dense planting generally decreases labour cost per one ton of the produced fruit. It mostly concerns the cutting trees costs, harvest costs and costs of chemical pesticides. Nowadays, the intensive fruit growing is characterized by lower cultivating shapes and a higher number of trees per plot unit (planting density for the cordon shape is as many as 4 000 trees per ha) (Drobný et al. 2004).

From the economic point of view, dense plantings require higher investments and their viability is shorter. Economic effectiveness of the plantings depends on modern varieties and fertilizing irrigation (mainly trickle irrigation). The period of the important economic fertility comes in intensive orchards in the interval of 2–5 years after the establishment. It depends not only on the fruit species and variety but also on the shape of head (the fastest fertility comes in the rachis and open scrub shapes). It enables to reach the investment return even if the orchard viability is 10–15 years. This way of growing results in a fertility decrease and a fruit quality decrease approximately 12–15 years after planting (Blažek 1998).

Based on the analysis of the given factors, it can be stated that economies of scale rank among important barriers to entry.

Product differentiation

Differentiation in fruit producing industry is very important. If there is a suitable structure of the grown species, in case of crop failure it is possible to offset the loss of one species against selling another species at a better price. It is not possible to change the variety structure according to the current demand in the market. The restoration takes 10–20 years if the

consumer preferences are changed. The choice of suitable varieties also affects the possibility of obtaining subsidies for the establishment of orchards.

It can be stated that product differentiation does not represent high barriers to entry.

Capital intensity

The particular components are represented by costs of the orchard establishment (soil and planting material prices) and of purchasing and installing the technologies for the supplemental irrigation. *Costs of orchard establishment* – there are two kinds of farm land prices in the Czech Republic:

- official prices – prices determined for tax purposes, for purchasing and selling of plots in the state ownership, they are prices set by the price orders of the Ministry of Finance and the Ministry of Agriculture of the Czech Republic. In the Czech Republic, the average official price of land according to the BSEU was 5.02 CZK/m² from 1993 to 2001, after its updating in 2002 it was raised to 5.24 CZK/m² (Němec et al. 2006).

- market prices – they are determined by supply and demand, their level is influenced mainly by the location and size of the plot, as well as the use of the purchased plot. The chart gives different market prices of plots differentiated according to the size of plot for sale. Large plots have the lowest prices which results from a low interest in these plots (<http://farmar.mze.cz>) (Table 1).

Němec, Kučera (2007) followed the development of farm land prices after the access of the Czech Republic to the EU. It was stated that after the accession to the EU, the prices have only slightly risen in comparison with the prices before the accession to the EU and that farm land prices are still distinctly lower than in the EU-15. The average market price of a farm plot for sale – larger than 10 ha – was 3.25 CZK/m² in the years 2000–2005.

When comparing the market price of a five-to-ten-hectare orchard before and after the Czech Republic joined the EU, it can be determined that the average market price increased by 100% (<http://mze.cz>).

The individual plots exhibit the following trend: the larger the plot to be sold, the lower the market price (Němec et al 2006).

The costs of establishment of a new orchard

These include costs of the nursery stock, machine labour, human labour, soil preparation, but also the costs of fencing, the necessary machinery and other investment to go with it. The costs of the establishment of the orchard alone and the costs of treatment before the trees bear fruit range from CZK 250 000 to CZK 650 000 per ha (depending on the fruit species and the number of trees per one hectare) (Kudová 2006).

In the year 2005/2006, 540.9 hectares of intensive orchards were planted in the Czech Republic, in 2006/2007 it was 740.2 hectares of intensive orchards. That represents an increase by 37% (<http://mze.cz>, <http://farmar.mze.cz>). Despite this, apple, cherry, peach and soft fruit orchards still have an unsatisfactory age structure (Kudová, Chládková 2007).

Costs of installation of the supplementary irrigation

The supplementary irrigation is essential in the modern intensive planting. The latest research indicates that it increases yields by 15–30% while improving the fruits. Among various irrigation types, the trickle irrigation seems to be the most suitable. It is reliable and the price is reasonable. Besides, the water consumption is low and it may be combined with the liquid fertilizer irrigation (Kudová 2005). The costs range between CZK 70 000 and 100 000 depending on the technology used (Drobný et al 2004).

Costs of the construction or reconstruction of a fruit storehouse

Fruits are in demand all year through; the construction of a storehouse with a controlled atmosphere should guarantee competitiveness of the new entities (in particular the ones growing apples and pears). Such investment is very costly and the amount of finances depends on the size of the storehouse and the installed technology.

Table 1. Average market prices of some kinds of plots from 2000 to 2005 (CZK/m²)

Kind of plot	Size of plot for sale (ha)								average
	under 0.1	0.1–0.25	0.25–0.5	0.5–1.0	1.0–2.0	2.0–5.0	5.0–10.0	above 10.0	
Orchard	156.79	146.70	89.78	46.53	69.80	54.64	3.79	4.63	65.79
Garden	192.97	155.83	77.25	74.35	46.41	10.45	10.28	2.35	134.34

Source: <http://farmar.mze.cz>

The high capital costs act as a significant barrier to entry.

Transfer costs

The transfer costs are not significant in fruit production. They are nonrecurring costs originating in the transfer from one supplier's production to another supplier's production. Such transfer costs incur, for instance, when the producer transfers from one supplier of nursery stock to another one (there are 75 nurseries in the Czech Republic) (<http://ovocnarska-unie.cz>). These costs cannot be determined exactly as individual subjects are not willing to disclose them. Generally, it might be stated that they do not represent a significant barrier to entry.

Access to distribution channels

Fruits are a seasonal commodity in the terms of production; they are harvested mostly in summer and autumn and the individual fruits ripen within a period of one month. That is why storage plays an important part in the sale of fruit.

Fruit storage capacity in the Czech Republic

The fruit storage capacity stood at 77 650 tonnes in the Czech Republic in 2007 (including air-conditioned storage and makeshift storage). Storehouses with a controlled atmosphere and the ULO storehouses constituted 46% of the total fruit storage capacity. New storage space construction is almost non-existent (<http://mze.cz>).

A barrier to a new producer's entry might be constituted by the necessity to guarantee the sale of own production. The following are kinds of distribution channels in the industry:

Sale to the processing industry – it is limited to a large extent as there are only a few canneries in the Czech Republic.

Sale to a chain of retail outlets – access to retail chains is very costly in the Czech Republic and, in my opinion, hardly practicable in the case of fruit manufacturing entities.

Sale to grocery stores – it is necessary, but with large volumes of production, this kind of sale cannot guarantee a sufficient market for the company.

Sale through sales cooperatives – Czech fruit producers may become members of sales cooperatives that organize sales of fruit for their members through a network of their own points of sales located in the major fruit growing regions in the Czech Republic. There are three cooperatives selling fruit in the Czech Republic (CZ FRUIT, ZN FRUIT, JIHOFRUKT) and

one selling nursery stock (CZ VITA PLANT) (<http://ovocnarska-unie.cz>).

Access to distribution channels is a significant factor that may act as a barrier to entry in the fruit producing industry, in my opinion.

Cost disadvantage independent of scale

This group includes the following factors:

Ownership of manufacturing technology – the costs of the purchase of manufacturing technology are linked with the capital requirements and economies of scale.

Advantageous access to material – a chance to buy a first-rate planting stock

Advantageous location – the location of the orchard should not be a significant barrier to entry in the industry

Knowledge curve or Experience curve – a new producer will probably be in a more difficult position than an established company (the potential lack of contacts and experience).

In general, the cost disadvantage depending on the scale seems to be a significant barrier to entry in the industry.

Government policy

Government subsidies

A fruit producer has to comply with the legal regulations applicable in the Czech Republic. These are in compliance with the chief EU directives. No automatic or non-automatic licences are in force for fruits, and there is the free movement of goods all over the EU. There is a common customs code and a common customs tariff. The commercial relations between the EU and the Third World countries are governed by preferential agreements (<http://mze.cz>).

Subsidies play an important part in influencing the industry and the market through the government policy.

Subsidies to establish new orchards

The aim of these subsidies is to restructure orchards, or rather to improve the health of fruit trees as well as the fruit produced. Judging from the variety composition, the current fruit production in the Czech Republic is far from the optimum. Old plantations in particular include a high proportion of varieties that are losing their market value. That is why it is necessary to take into account the variety restructuring (Drobný et al. 2004). The subsidized item is constituted by the area of the newly established orchard planted with the varieties recommended by

Table 2. Evaluation of subsidy scheme “Subsidies to restructure orchards”

Year	Newly planted orchards (ha)	Subsidy paid (thousand CZK)	Newly planted small fruit orchards (ha)	Subsidy paid (thousand CZK)
2003	1 123	104 273	–	–
2004	281	37 976	130	4 500
2005	360	56 039	52	2 614
2006	553	88 752	90	4 500

Source: <http://farmar.mze.cz>, <http://mze.cz>

the Association of the Integrated Systems of Fruit Production (SISPO) and managed in compliance with the directives for the integrated systems of cultivation (<http://mze.cz>).

Support for orchard restructuring (for 2007):

- A rate lower than and equal to CZK 200 000 per ha of an orchard planted with the selected planting material of apple, pear, apricot, peach and plum trees on an area of minimum 1 hectare of one species, while the minimum number of trees is 800 pieces per ha
- A rate lower than and equal to CZK 100 000 per ha of an orchard planted with the selected planting material or apple, pear, apricot, peach, plum, sweet and sour cherry trees on an area of minimum 1 hectare of one species, while the minimum number of trees is 400 pieces per ha.
- A rate lower than and equal to CZK 50 000 per ha of an orchard planted with the selected planting material of small fruits (currant, gooseberry, raspberry) on an area of minimum 0.5 hectare of one species, while the minimum number of seedlings is 3 000 pieces per ha (<http://mze.cz>) – Table 2.

Subsidies to construct trickle irrigation (for 2007) in orchards, hop fields, vineyards and nurseries – the amount is lower than and equal to CZK 60 000 per ha (<http://mze.cz>) – Table 3.

Other schemes include Subsidies for Recovery of Field and Special Crops, Subsidies for Farming Consultancy, Special Consultancy for Plant Production, and others.

Table 3. Evaluation of subsidy scheme “Subsidies to construct trickle irrigation”

Year	Area (ha)	Total subsidy paid (in thousand CZK)/ subsidy per ha (CZK)
2003	634	16 824/26 540
2004	272	13 265/48 700
2005	223	12 532/56 160
2006	262	15 701/60 000

Source: <http://farmar.mze.cz>, <http://mze.cz>

Besides the subsidies aimed at the support of the particular investments, the *Support and Guarantee Farm and Forestry Fund (PGRLF)* offers subsidies to implement long-term investment plans with regard to restructuring, modernising and further development of agricultural subjects. The schemes are: Farmer, Soil and Insurance support.

The Single Area Payment Scheme (SAPS) – another financial aid in farming. These are direct payments provided on the per-hectare-of-managed-soil basis.

The Horizontal Rural Development Plan (HRDP) relating to agro- environmental measures in compliance with the government directive No.242/2004 Col.

The European Agricultural Fund of Rural Development 2007–2013 – a scheme to support rural development, which is part of the EU Common Agricultural Policy. This scheme consists of four strategic development axes (<http://farmar.mze.cz>; <http://mze.cz>).

The government policy is a significant barrier to the entry in the fruit producing industry in my appraisal.

Anticipated retaliatory measures of existing companies

Low industry growth – this is linked to the reduction in revenues of the established companies; that is

Table 4. Overview of barriers to entry

Barrier	Significance
Economies of scale	high
Product differentiation	low
Capital intensity	high
Transitional costs	low
Access to distribution channels	high
Cost disadvantage independent of volume	medium
Government policy	high
Anticipated retaliatory of existing companies	high

Source: own compilation

why a strong response of the established companies may be expected.

Efforts to gain a significant position in the industry – in case of efforts of a new company to gain a significant position, a strong response of the established companies may be expected, particularly a response of the companies wielding huge resources.

It follows from both the above-mentioned signals that the anticipated retaliatory measures will constitute a significant factor that acts as a considerable barrier to entry.

CONCLUSION

The factors related to the barriers to entry keep changing continuously within the monitored period of time owing to the application of new strategies by the competitors, changes resulting from the state interference, the overall political situation as well as the development of new technologies. The significance of barriers to entry in the fruit producing industry is illustrated in the Table 4.

The performed analysis implies that the barriers to entry in the fruit producing industry are rather high at the moment, which should deter the potential new companies from such an entry.

REFERENCES

- Blažek J. (1998): *Ovocnictví (Fruit growing)*. Květ, Praha; ISBN 80-85362-43-0.
- Blažek J. (2001): *Pěstujeme jabloně (We grow on apple trees)*. 1st Edition, Nakladatelství Brázda, Praha; ISBN 80-209-0294-5.
- Karlöf B., Lövingsson F.H. (2006): *Management od A do Z (The A–Z of Management Concepts and Models)*. 1st Edition, Computer Press, a.s., Brno; ISBN 80-251-1001-X.
- Kudová D. (2005): *Bariéry vstupu v odvětví produkce jablek v České republice (Barriers to entry in the Czech apples production industry)*. In: *Sborník prací z mezinárodní vědecké konference Agrární perspektivy XIV*. ČZU, Praha; ISBN 80-213-1372-2.
- Kudová D. (2006): *Atraktivita odvětví produkce jablek v ČR (The attractiveness of apple production in the Czech Republic)*. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, LIV (3): 47–60; ISSN 1211-8516.
- Kudová D., Chládková H. (2007): *Konkurenční prostředí odvětví produkce ovoce v České republice (Competitive environment in the field of fruit production in the Czech Republic)*. In: *Proceedings of abstracts*. 1st Edition, VŠB -TUO, Ekonomická fakulta, Ostrava, pp. 758–765; ISBN 978-80-248-1458-2.
- Němec J., Kučera J. (2007): *Land market development after the accession to EU. Agricultural Economics – Czech*, 53 (4): 154–160.
- Němec J., Štolbová M., Vrbová E. (2006): *Cena zemědělské půdy v ČR v letech 1993–2004 (The Prices of the Agricultural Land in the Czech Republic 1993–2004)*. Hwer, s.r.o., Ostrava Praha; ISBN 80-86671-25-9
- PORTER, M. E. (1994): *Konkurenční strategie. (Competitive Strategy)*. 1st Edition, Victoria Publishing, Praha; ISBN 80-85605-11-2.
- Žufan P., Pyšný T. (2005): *Bariéry vstupu v odvětví pivovarnictví v České republice. (Barriers to entry in the Czech brewing industry)*. In: *Sborník prací z mezinárodní vědecké konference Agrární perspektivy XIV – Znalostní ekonomika*. ČZU, Praha, pp. 490–494; ISBN 80-213-1372-2.

Internetové zdroje

- Česká ovocnářská unie. Available at <http://ovocnarska-unie.cz> [Quoted 2008-02-02].
- Drobný J., Bartoš J., Nachlinger Z., Součková H., Ludvík M.: *Konkurenceschopnost českého zahradnictví*. Available at <http://vuze.cz> [Quoted 2004-05-10].
- Situační a výhledová zpráva – Ovoce 2004–2006. Ministerstvo zemědělství ČR, Praha. Available at <http://farmer.mze.cz> [Quoted 2007-03-15].
- Situační a výhledová zpráva – Ovoce 2007. Ministerstvo zemědělství ČR, Praha. Available at <http://mze.cz> [Quoted 2008-02-03].
- Situační a výhledová zpráva – Půda 2006. Ministerstvo zemědělství ČR, Praha. Available at <http://farmer.mze.cz> [Quoted 2008-02-02].

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