WoodEMA, conference 2013
Innovation as the source of values in the forestry, wood processing and furniture manufacturing

The Using of Operating Leverage for the Evaluation of Investment Effectiveness in the Layered Materials Production

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Layered Materials

- production of materials based exclusively on wood substance has their limitations;
- progress could be achieved by improvement of the production - by using other and different non-wood components;

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wood lamination

Production of layered materials:

- a complex of difficult and continual technological processes;
- *production line* consists of several and expensive technological blocks;
- requires high initial investments;

Investments to the Production

- procurement of technologies for layered materials production is evaluated by companies as a ***capital intensive investment;***

- investments decision making – follow **2 basic criteria:**
  1. profitability;
  2. financial stability;

- technological line, needed for production, may be procured by **2 the most common variants**:
  1. purchase;
  2. operational rent;

Costs Structure

Variant 1 – purchase – the price for production technologies is transformed to the fixed costs (FC) throuhg the form of depreciaton;

Variant 2 – operational rent – the cost for annual rent belongs to the variable costs (VC).

The rent depends from the extent of technology using;

<table>
<tr><td rowspan="2">VARIABLE COSTS
(VC)</td><td>FIXED COSTS
(FC)</td><td>EBIT - earning
before interest and taxes</td></tr>
<tr><td colspan="2">CONTRIBUTION MARGIN
(CM)</td></tr>
<tr><td colspan="3">R E V E N U E</td></tr>
</table>

Variant 1 – High initial investment to technologies:

- increase the proportion of fixed costs to total costs;
- increase the business risk, which depends from the structure of total costs;

Operating Leverage

Business risk can be calculated through:

Degree of operating leverage (DOL):

$$DOL = \frac{CM}{EBIT}$$

higher DOL:

- indicates higher business risk;
- dominant for highly automated processes;
- production has high break-even point;

lower DOL:

- characterized by low rate of fixed costs;
- indicates lower business risk;
- production has low break-even point;

Financial Report

- **production:** measurements of battenboards 600x3950x45 mm
- **1 pc.** 2.37 sqm., VC approx. **40 € / 1 sqm.**
- cost of depreciation -
  annual rent - **150 000 € / year**

VARIANT		Q	COSTS (€)		
			FC*	VC	TC
1	purchase	10 000	250 000	950 000	1 200 000
2	operational rent	10 000	100 000	1 100 000	1 200 000

***** FC (same in both variants) = 100 000 € = constant costs

DOL calculation

TC = 1 200 000 €

Variant		Revenue (plan)	EBIT Revenue-TC	CM EBIT+FC	DOL CM/EBIT
1	**purchase**	1 400 000	200 000	450 000	**2.25**
2	**operat. rent**	1 400 000	200 000	300 000	**1.50**

- **Varinat 1** - higher rate of fixed costs is reflected by higher degree of operating leverage (DOL = 2.25) and higher business risk;

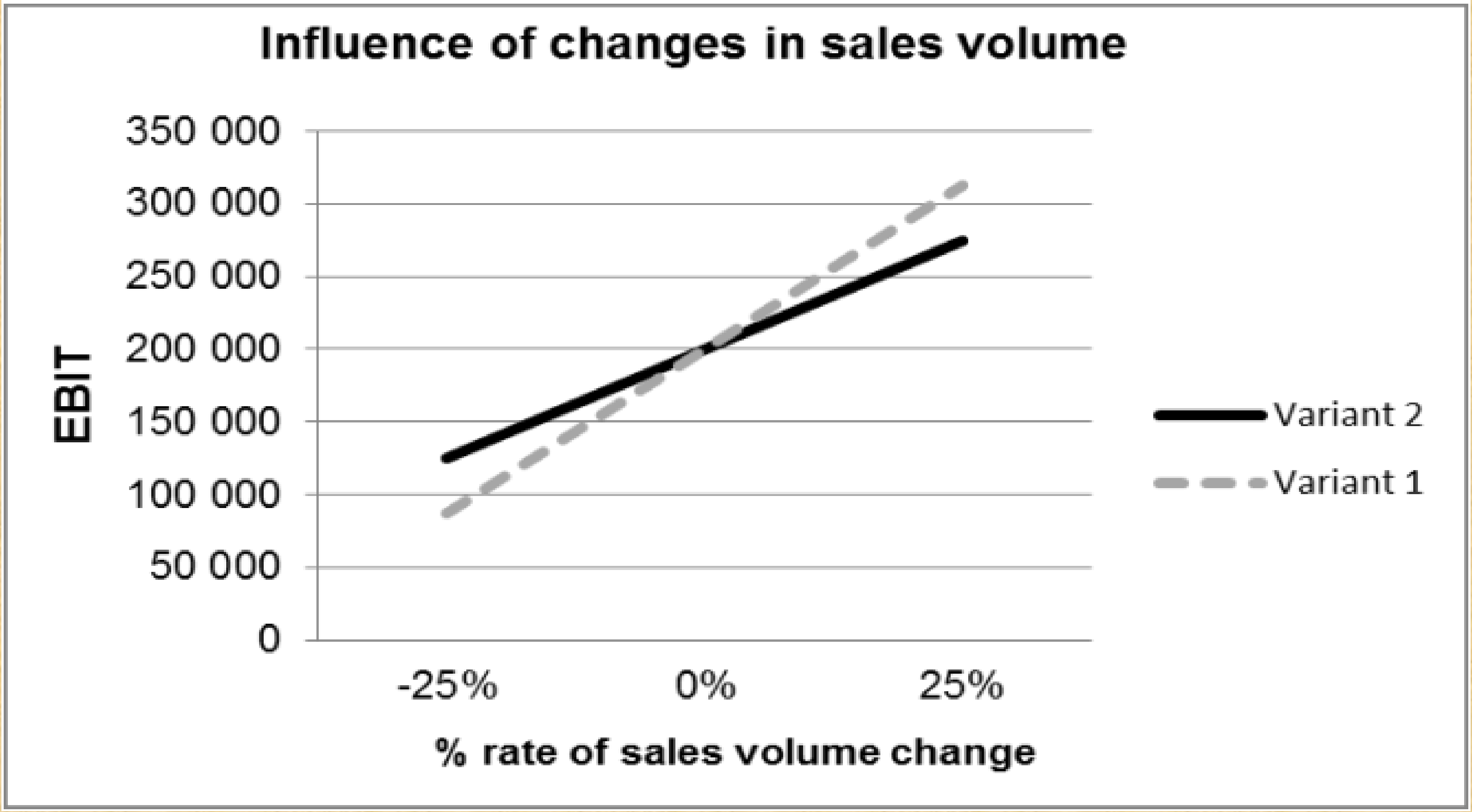
Sensitive to Sales Volume Changes

EBIT – is different sensitive
to changes in sales volume

↓

Change of sales volume =
% rate of sales volume change x DOL x EBIT

VARIANT		Change of sales volume + 25 %	Change of sales volume - 25 %
1	purchase	+ 25% x 2,25 x 200 000 = + 112 500 €	- 25% x 2,25 x 200 000 = - 112 500 €
	EBIT = 200 000 €	**= 312 500 €**	**= 87 500 €**
2	operational rent	+ 25% x 1,5 x 200 000= = + 75 000 €	- 25% x 1,5 x 200 000 = = - 75 000 €
	EBIT = 200 000 €	**= 275 000 €**	**= 125 000 €**



Variant 2 (operational rent) in compare with Variant 1 (purchase)

- the increase of sales volume *produces* lower increase of EBIT
- the decrease in sales volume *produces* lower decrease of EBIT

Variant 1 is more sensitive to changes in sales volume

Results

If other conditions are unchanged:

- proportion between price and variable costs is higher, operating leverage becoming stronger;
- ***stronger DOL*** = higher perspective of profit growth;
- ***stronger DOL*** = the changes in sales volume are more sensitive and business risk has been increased;
- ***lower DOL*** = lower business risk, but in the case of industry growth produces lower profit;

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