

Swiss Leading House

Economics of Education • Firm Behaviour • Training Policies

Rates of Return and Risk-Return Trade-Offs to Different Educational Paths: Vocational, Academic and Mixed

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Motivation and background

- Previous literature shows: type and level of education crucially determine an individual's labor market success.
- However, previous studies always focus on highest educational degree.

→ What about **combinations** of different types of education?

There are individuals with:

- a purely academic educational path
- a purely vocational educational path
- a mixed educational path, i.e. combination of academic and vocational education

Aim of our study

We study labor market outcomes of different types of educational paths (purely academic, purely vocational and mixed).

Are mixed educational paths a detour or are they rewarded in the labor market?

Theoretical analysis of labor market outcomes (1): Increased Earnings and Net Benefits

According to Becker (1964) we expect any additional qualification (of either type) to have additional returns on the labor market because they increase productivity (in various ways):

H1: Additional education of all types leads to higher earnings (not only highest level of education).

(→ Sounds trivial, but has never been studied due to typical design of empirical studies).

Additional education has additional costs.

→ What about net benefits (additional earnings minus additional costs)?

Theoretical analysis of labor market outcomes (2): Risk-return trade-offs

Human capital investments not only involve differences in average earnings but also in risk (variance of earnings).

→ Is there a risk-return trade-off?

H2: The higher the rate of return is, the higher the risk associated with a certain type of educational path is.

Some like risk more than others → choose different educational paths!

Entrepreneurs are typically assumed to have a higher risk tolerance than employees → entrepreneurs go for higher earnings by tolerating higher risk.

Theoretical analyses: Lazear's jack of all trade theory

So what are educational paths with higher earnings for entrepreneurs?

→ According to Lazear's jack-of-all trades theory (Lazear 2005): those with broader sets of balanced skills.

- Individuals with a **purely vocational** educational path are specialized in one type of skill → better off as employees

*H3-1: Individuals with a **purely vocational educational path** earn more as **employees** than as entrepreneurs.*

Theoretical analyses: Lazear's jack of all trade theory (cont'd)

- **Mixed** educational paths consist of a broad variety of skills (because of the combination of academic and vocational qualifications) → better off as entrepreneurs
- **Purely academic** education is assumed to be easily transferable to different types of occupations and job requirements (because academic skills are usually not occupation specific) → better off as entrepreneurs

*H3-2: Individuals with a **mixed educational path** or with a **purely academic educational path** are better off as **entrepreneurs** than as employees.*

*H4: Individuals with a broad educational background get a higher rate of return as entrepreneurs, but they also face a **higher income risk** than employees.*

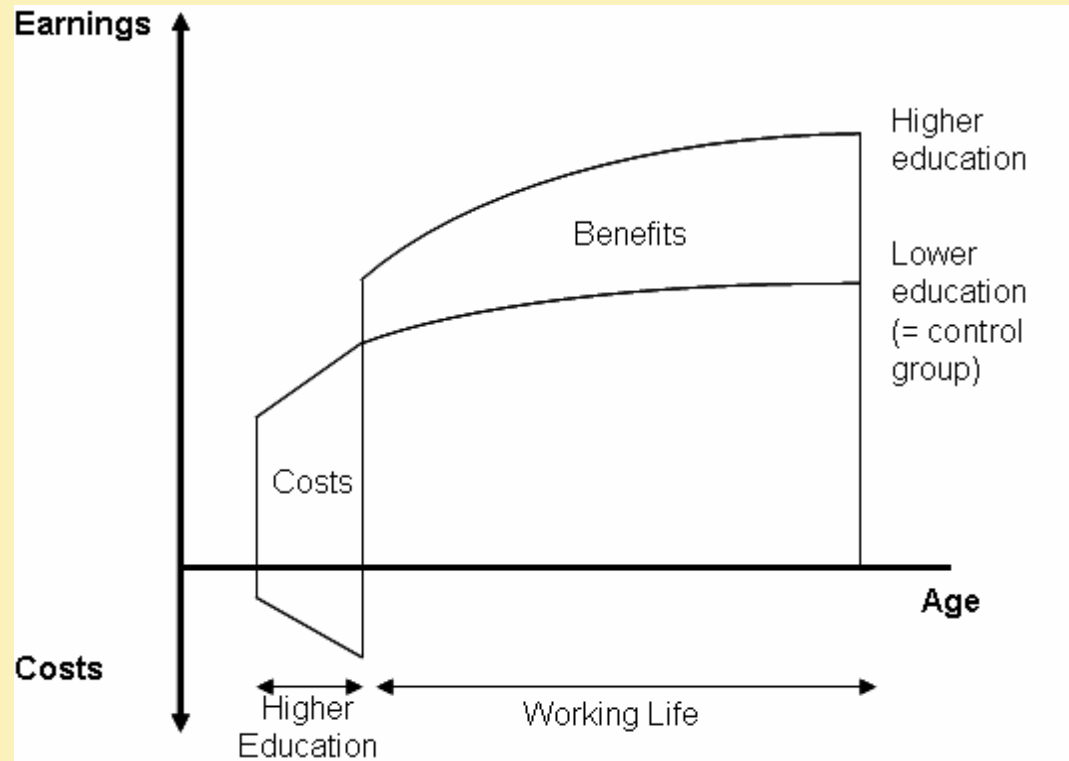
Empirical Methods and Results

Estimation methods

STEP 1: Estimate extended Mincer earnings function

STEP 2: Consider lifetime earnings (and opportunity costs)

→ we calculate the internal rate of return, i.e. the discount rate at which the sum of costs and the sum of benefits exactly offset each other



STEP 3: Assess the risk

- Risk is measured as the average squared coefficient of variance.
- Perform all analyses separately for entrepreneurs and employees to calculate coefficient of variance.

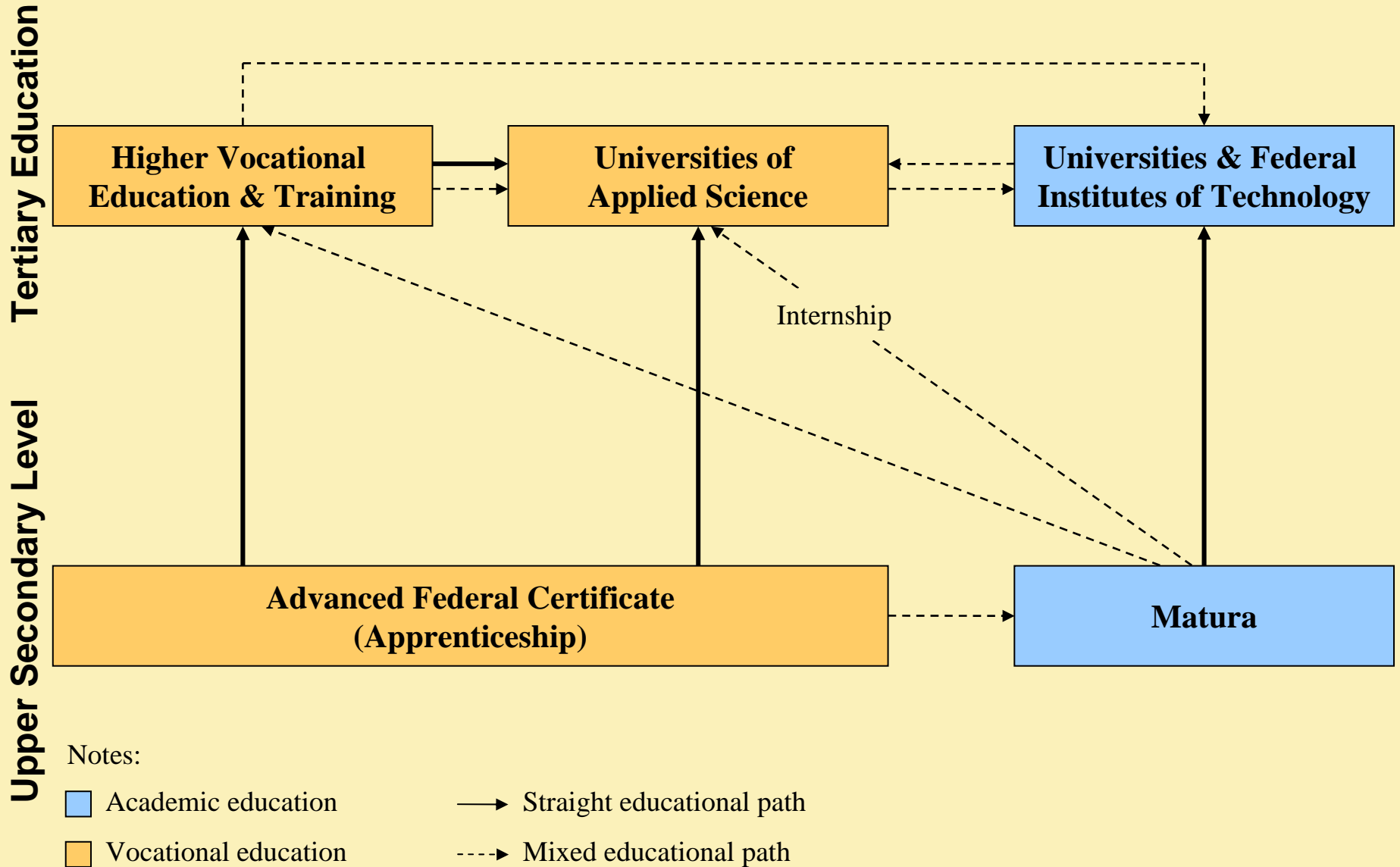
Data: Swiss Labor Force Survey (SLFS)

- representative sample of Swiss households
- conducted annually since 1991; data used in this analysis: 1999-2005

SLFS particularly suitable for our study, because information about:

- individual's complete educational career
- professional status
- yearly (net) earnings, unemployment risk

Educational system of Switzerland



Focus on people who have completed higher tertiary education.

→ Main educational paths leading to a tertiary educational degree; categorized by type and order of educational degrees.

Exit \ Entry	Vocational	Academic
Vocational	Typ I, purely vocational (64 %)	Typ II, mixed, with vocational entry (4 %)
Academic	Typ III, mixed, with academic entry (9 %)	Typ IV, purely academic (23 %)

Note: Own calculations based on SLFS 1999-2005.

Mixed educational paths are NOT an unusual phenomenon!

Results: labor market outcomes to different educational paths

STEP 1: Estimate Mincer earnings function

Net yearly earnings	Spec. (1)
Purely academic	Reference
Mixed with vocational entry & academic exit	0.2793*** [0.0488]
Purely vocational	-0.0060 [0.0293]
Mixed with academic entry & vocational exit	0.1195** [0.0499]
Qualifications function	YES
Mixed educational paths are c.p. associated with significantly higher earnings!	
R ²	0.10
N	10606

Notes: Cluster-robust std.errors are in parentheses. *Statistically significant at the 0.10 level; **at the 0.05 level; ***at the 0.01 level.

Mixed educational paths (i.e. the additional qualifications) are rewarded by the labor market! (*H1* supported!)

→ One puzzle to be solved: why are mixed educational paths (which have the highest earnings outcomes) only chosen by a minority?

STEP 2: Consider benefits and costs of additional education

→ calculate internal rates of return (IRR)

	IRR
Purely academic	10.30%
Mixed with vocational entry & academic exit	8.45%
Purely vocational	13.34%
Mixed with academic entry & vocational exit	17.79%

→ Mixed educational paths with vocational entry & academic exit are now the least favorable paths .

→ However: mixed educational paths with academic entry & vocational exit are still a more profitable choice than straight educational paths.

There is still a puzzle to be solved: why do people choose educational paths with strongly unfavorable rates of return?

Why don't all choose the educational path with the highest return?

→ risk matters!

STEP 3: Assess the risk

	IRR	Risk (Coef. of Var.)
Purely academic	10.30%	0.15
Mixed with vocational entry & academic exit	8.45%	0.17
Purely vocational	13.34%	0.13
Mixed with academic entry & vocational exit	17.79%	0.25

- Mixed educational paths are associated with a (substantially) higher income risk than straight educational paths. (*H2* not supported.)
- Mixed with academic entry have exceptionally high risk → reason why they are rarely chosen.
- But the picture still does not fully fit: why do people choose mixed with vocational entry? → separate analyses for entrepreneurs and employees

Separate analyses for entrepreneurs and employees

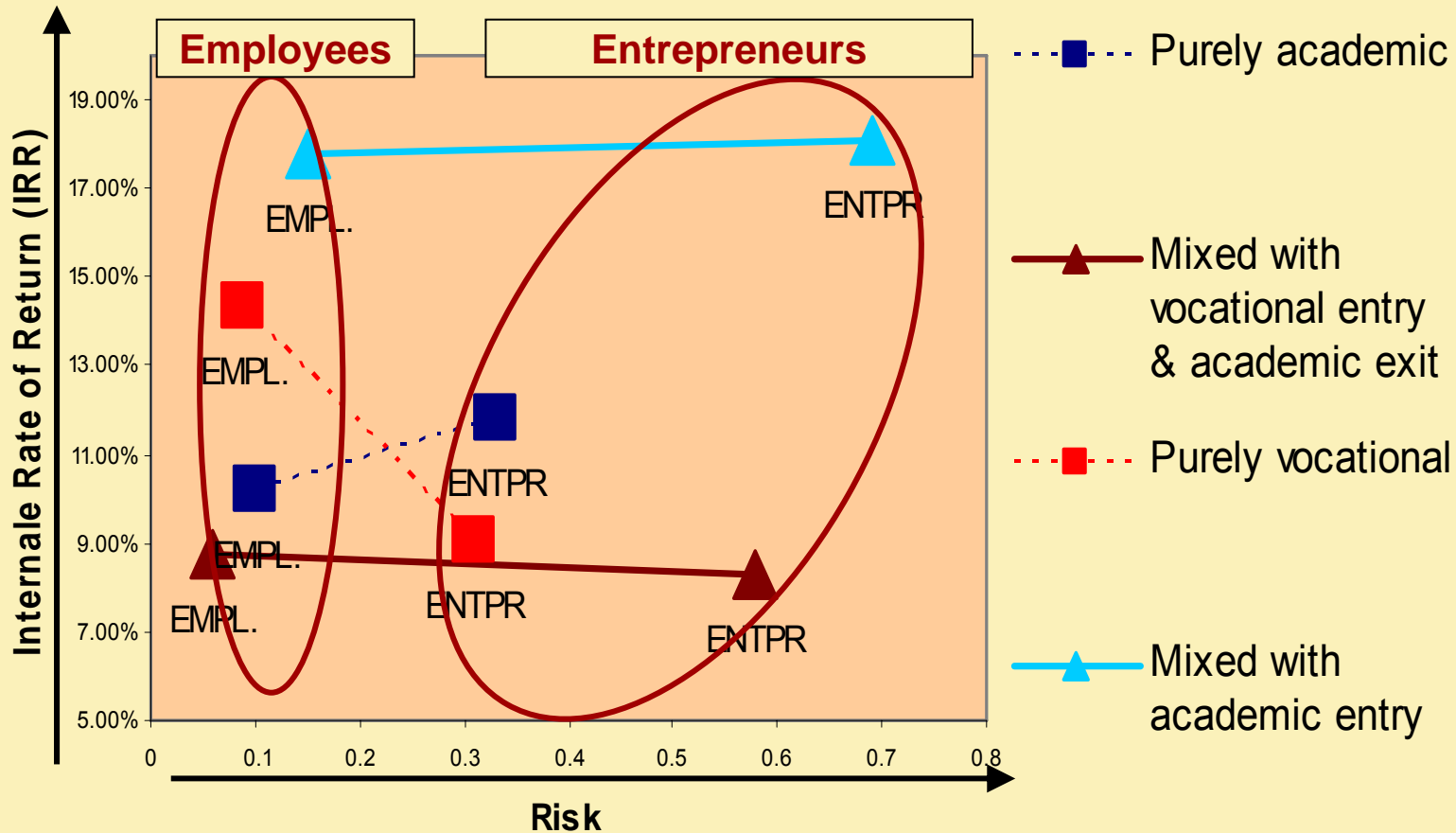
STEP 2: IRR

	IRR	
	Employee	Entrepreneur
Purely academic	10.18%	11.81%
Mixed with vocational entry & academic exit	8.77%	8.29%
Purely vocational	14.33%	9.05%
Mixed with academic entry & vocational exit	17.75%	18.10%

There is an entrepreneurial premium for individuals with a broad educational background, while strong specialization seems to pay for employees. (*H3 supported.*)

Separate analyses for entrepreneurs and employees

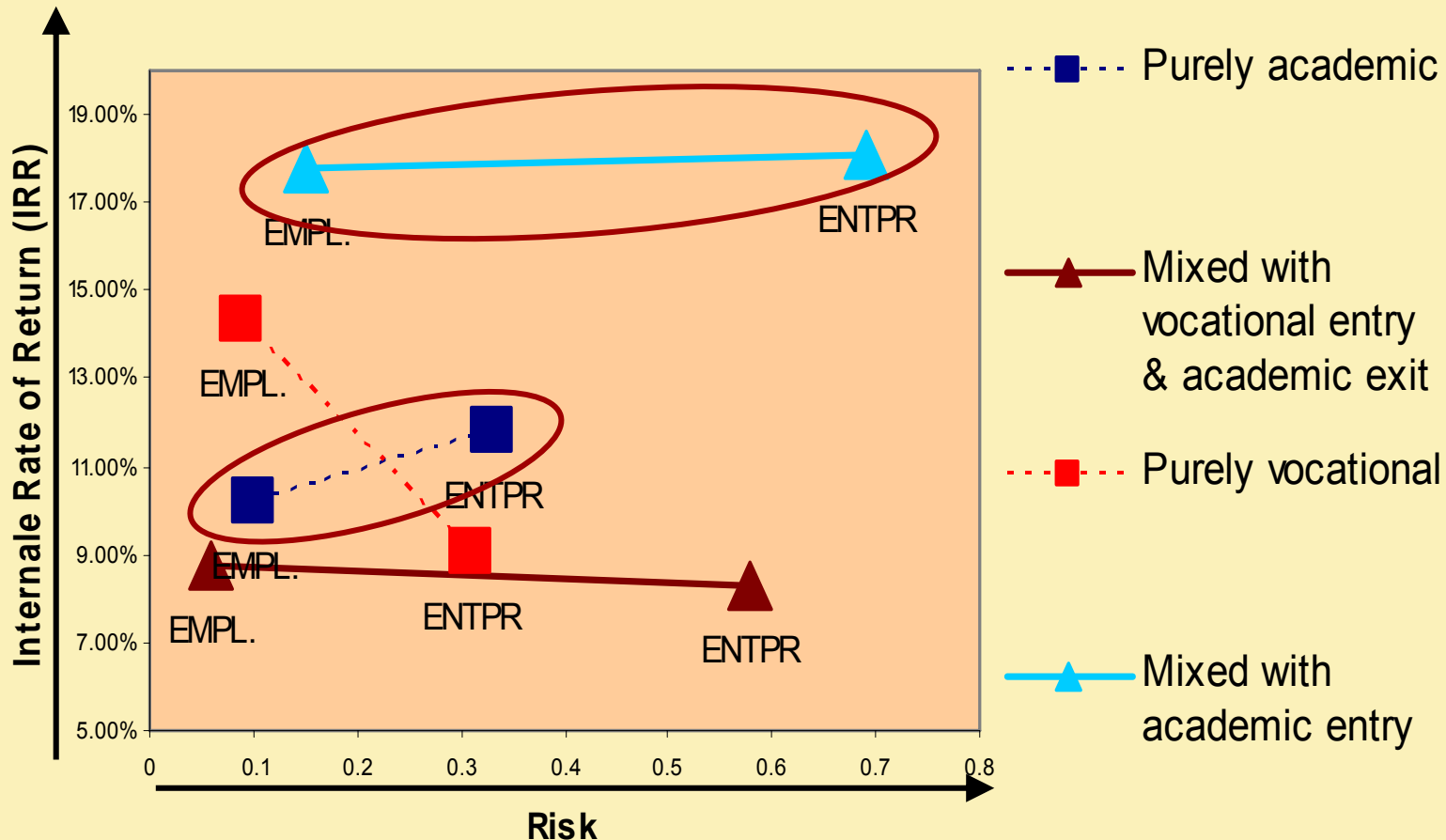
STEP 2&3: IRR and Risk



- Entrepreneurs are generally faced with a higher income risk than employees.
- Mixed with vocational entry has the lowest risk for employees and accordingly the lowest IRR → now it fits

Separate analyses for entrepreneurs and employees (cont'd)

Some entrepreneurs are compensated for the higher risk...



→ Evidence for a risk-return trade-off (*H4* supported):

For mixed with academic entry & vocational exit as well as for purely academic the higher risk is compensated for by a higher income.

Conclusion

We have examined the rates of return and the risk to complete educational paths to explain educational choice.

Our findings...

- ... indicate that it is important to consider complete educational paths,
- ... demonstrate that not only earnings but also costs of different educational path should be considered (→ IRR)
- ... show that IRR is not enough; results would be misleading without considering additional risk,
- ... demonstrate that analyses of investments in human capital should (additionally) distinguish entrepreneurs from employees (→ Jack-of-all-trades vs. specialists matters).

Thank you for your coming!

Appendix

STEP 2: ... as an alternative measure: calculate Baldwin rates of return

Baldwin rates of return are calculated as follows:

- 1) Benefits are compounded to the time of retirement = final value
- 2) Costs are discounted to the starting point = investment
- 3) BRR = rate at which the discounted final value and the discounted investment equalize.

	IRR	BRR
Purely academic	10.30%	5.88%
Mixed with vocational entry & academic exit	8.45%	4.88%
Purely vocational	13.34%	6.05%
Mixed with academic entry & vocational exit	17.79%	6.88%

→ Results are confirmed; BUT: BRR are about half the IRR