Cheating in the evaluation. An expedient to estimate the impact of intangibles on the enterprise value of the high-growth start-ups

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Abstract

This study investigates the effect of investments in intangible fixed assets and human capital on the Enterprise Value (EV) of Italian high-growth startups (HGSs). To test our hypotheses, we conducted several Ordinary Least Squares (OLS) regression analyses on a dataset comprising 782 HGSs. The EV was estimates using the Discounted Cash Flow (DCF) method. Our findings reveal a positive and statistically significant relationship between investments in intangible assets and EV. However, investments in human capital and highly skilled workers show a negatively relationship with EV. Lastly, a positive and statistically significant relationship between value-added per employees and the EV of HGSs has been identified.

This study offers valuable insight into the process through which new firms generate value. By strategically investing in intangible assets and human capital, startups not only enhance their probability of survival but also improve their growth potential. This allows these companies to overcome the challenges of the early stage and embark on a sustainable growth process. To spotlight the unique value drivers of these companies, unlike prior studies, we manually estimate the EV. We have employed the DCF method by playing the cards face up: we used the actual cash flows realized by the HGSs during the study period instead of relying on forecasts. We have therefore "cheated" to measure the value created by the HGSs. This research can be considered a pioneering study that significantly contributes to the ongoing debate on the value creation process in fast growing startups.

Keywords: High-growth firms, High-growth start-ups, Intangibles, Firm growth, Value creation, Human capital

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Appendix A

Table 2 - Distribution of HGSs by industry sector based on the 2-digit codes of the ATECO ISTAT 2007

Sec.	Description	2 digit ATECO2007	N	Perc.
A	Agriculture, Forestry and Fishing	01 - 03	11	1.40
C	Manufacturing	10 - 33	191	24.42
D	Electricity, Gas, Steam and Air Conditioning Supply	35	1	0.12
E	Water Supply; Sewerage, Waste Management and Remediation Activities	37 - 38	4	0.51
F	Construction	41 - 43	92	11.76
G	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	45 - 46	150	19.18
H	Transportation and Storage	49 - 53	52	6.65
I	Accommodation and Food Service Activities	55 - 56	144	18.41
J	Information and Communication	58 - 63	32	4.09
M	Professional, Scientific and Technical Activities	70 - 74	31	3.96
N	Administrative and Support Service Activities	77 - 82	49	6.26
R	Arts, Entertainment and Recreation	90 - 93	17	2.17
S	Other Service Activities	96	8	1.02
	Total number of HGSs		782	100

Source: authors own elaboration

Table 3 - Distribution of HGSs by regions

Regions	N	Perc.
Abruzzo	17	2.17
Basilicata	5	0.64
Calabria	13	1.66
Campania	106	13.55
Emilia-Romagna	50	6.39
Friuli-Venezia Giulia	13	1.66
Lazio	77	9.85
Liguria	13	1.66
Lombardy	160	20.46
Marche	18	2.30
Molise	1	0.13
Piedmont	43	5.50
Puglia	45	5.75
Sardinia	13	1.66

Sicily	49	6.27
Tuscany	57	7.29
Trentino Alto-Adige	14	1.79
Umbria	13	1.66
Vallée d'Aoste	1	0.13
Veneto	74	9.46
Total HGSs	782	100

Source: authors own elaboration

Table 4 - Description and method of measurement of the variables used in the regression analysis.

Variable name (label)	Measurement	Description
Dependent variable		
Enterprise Value (ln_EV)	DCF Method (Appendix A)	The natural logarithm of the EV estimated by DCF method
Independent variables		
Intangible Ratio (IR)	Intangible asset/Total asset	The ratio between intangible fixed assets and total assets, as a measure of the weight of the intangible capital of a company
Staff costs per employee (LC)	Labor costs/Number of employees	The ratio between staff costs and the number of employees, as a measure of the qualification level of the employees
Revenues to staff costs ratio (LE)	Sales/Labor costs	The ratio between Revenues and staff costs, as a measure of the efficiency of the employees
Added Value per Employee (LP)	Added Value/Number of employees	The ratio between Added Value and the number of employees, as a measure of the productivity of the employees
Control variables		
Number of Employees (EMPL)	Logarithmic transformation of the number of employees	The number of employees of a company as a dimensional index
Sales (REV)	Logarithmic transformation of sales	The turnover volume of a company as a dimensional index
Total Asset (TA)	Logarithmic transformation of total asset	The Total Asset of a

		company as a dimensional index
Indebtedness	Long-term debts/Total Asset	Long-term debts divided by total asset
Leverage	Total Asset/Equity	Total asset divided by equity
Geographical dummies	Three dummy variables representing the primary geographical macro-areas of Italy: North, Central Italy and South	
Industry type	Four dummy variables representing the macro-sector in which the firms operate (based on the first 2 digit of ATECO ISTAT 2007 classification system)	

Source: authors own elaboration

"Cheated" Enterprise Value Estimation

Many scholars consider the Discounted Cash Flow (DCF) valuation as the most accurate valuation method (French, 2013; Dönbak and Ukav, 2016). The EV of the HGSs was estimated using the DCF method, taking 01/01/2015 as evaluation date. The analytical period runs from 2015 to 2019 (5 years). The Terminal Value (TV) was calculated using the average FCFO of the analytical period as a long-term cash flow from year 2019 onwards; therefore, does not consider the effects of COVID-19. For simplicity, given that no high inflation was recorded in the selected period, we proceed without carrying out the normalization of flows.

$$EV_{15} = \frac{FCFO_{15}}{(1 + WACC)^1} + \frac{FCFO_{16}}{(1 + WACC)^2} + \frac{FCFO_{17}}{(1 + WACC)^3} + \frac{FCFO_{18}}{(1 + WACC)^4}$$
$$+ \frac{FCFO_{19}}{(1 + WACC)^5} + \frac{TV}{(1 + WACC)^5}$$

$$TV = \frac{FCFO_{N+1}}{WACC - g}$$

$$W = EV - PFN$$

Where g is the long-run growth rate for determining the TV. The choice was made considering that at the end of the analytical period the HGSs stabilize their growth at the expected inflation rate. A 2% long-run growth rate was chosen looking at the latest forecasts made by the ECB, dated 9 June.

Still regarding TV, since it derives from the capitalization of the medium/long-term flow (given by the average of the flows of the years from 2015

to 2019), it does not consider the effects of the COVID-19 pandemic. In this regard, this study has preferred for the moment focusing the attention on the value created by companies, without considering the effects of the pandemic, which would certainly have distorted the results of our analysis, while reserving this item for future analysis.

The WACC is the Weighted Average Cost of Capital used in discounting cash flows. The data was provided for each sector by Damodaran website[1]; it should be noted that the data downloaded from the Damodaran site are estimated as of January 2015, the date of our evaluation.

The FCFOs are the operating cash flows available to both shareholders and other debt lenders. The calculations made to estimate the FCFOs for each year t are as follows:

$$FCFO_t = EBIT_t(1 - IRES_t) - IRAP + D\&A_t - \Delta WC_t - CAPEX_t$$

Where EBIT is Earnings Before Interests and Taxes. IRES is companies' Income Tax, which has been reduced to 24% since 2017. D&A are Depreciations and Amortizations. IRAP is the Italian regional tax on productive activities, calculated as follows:

$$IRAP = (EBIT + Staff\ Costs) * 3.90\%$$

ΔWC is the change in Working Capital from year *t* to the year *t-1*. Finally, CAPEX is the Capital Expenditure (only the tangible and intangible components of fixed assets have been considered, and not even financial ones); the CAPEX was calculated as follows:

$$CAPEX_t = \Delta PP\&E + D\&A_t$$

Where the ΔPP&E indicates the absolute change in the book value of property, plant, and equipment from the current year (*t*) to the previous year (*t-1*).

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[1] http://pages.stern.nyu.edu/~adamodar/.