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Multi-Faceted Growth in Creative Industries

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***Abstract*—**The purpose of this study is to explore the different facets of growth among micro, small and medium-sized firms in Croatia and to analyze the differences between models designed for *all* micro, small and medium-sized firms and those in *creative* industries. Three growth prediction models were designed and tested using the growth of sales, employment and assets of the company as dependent variables. The key drivers of sales growth are: prudent use of cash, industry affiliation and higher share of intangible assets. Growth of assets depends on retained profits, internal and external sources of financing, as well as industry affiliation. Growth in employment is closely related to sources of financing, in particular, debt and it occurs less frequently than growth in sales and assets. The findings confirm the assumption that growth strategies of small and medium-sized enterprises (SMEs) in creative industries have specific differences in comparison to SMEs in general. Interestingly, only 2.2% of growing enterprises achieve growth in employment, assets and sales simultaneously.

***Keywords*—**Creative industries, growth prediction model, growth determinants, growth measures.

I. Introduction

CREATIVE industries, unlike other traditional sectors, have a fragmented structure, with the share of micro firms markedly higher than in other sectors. Micro-sized firms are commonly absent from the high-growth related research focused on firms that employ 10 or more people. Subsequently, the question of growth-patterns across the population of firms in creative industries has remained unanswered. In order to understand the potential of creative industries to drive economic development, more detailed knowledge on the nature of the growth across micro, small and medium-sized firms in creative industries is needed. Previous research indicates that firms in creative industries face higher unpredictability of sales and lower negotiating power in supply-channel chain management. In addition, they usually delay employment growth and use networks to scale-up their businesses. Their intangible inputs or outputs present a challenge in securing sources of financing, the attention of policy makers and professional support. However, there is only limited empirical evidence on how firms in creative industries grow and if they have commonalities in their growth. The purpose of this paper is to explain predictors of growth of firms in creative industries across the population of micro, small and medium sized firms and how their growth trajectory differs in comparison with other business sectors.

The study utilizes a dataset of financial statements from the population of the micro, small and medium-sized firms in Croatia for the 2008 to 2012 period. Since the dependent variable is dummy (high growth vs. non-high growth), logistic regression was used for the models' development and testing.

Our paper contributes to existing literature with new empirical evidence on high growth derived from firm-level data, as well as a specific industry and country setting. Accordingly, new empirical evidence opens new perspectives for policy makers in terms of adjusting their policies and seizing the growth potential of creative industries. Finally, the study offers a methodological approach based on data that are standardized and accessible for the entire population of firms. Subsequently, the approach can be easily adjusted to different national settings and customized for different units of analysis, and hence also contributes to scholars and researchers.

The paper begins with a review of the literature and previous research related to the creative industry, growth and firm level characteristics. It continues with a description of the methodology. The major findings are then presented and discussed from the perspective of their support of the main assumptions and corroboration of previous research. The paper concludes with the assessment of the research limitations and suggestions for further investigations.

II. Previous Research

A. Creative Industries Contribution and Size

Creative industries encompass a variety of industries such as: advertising, architecture, arts and antiques, crafts, design, film and video, music, the performing arts, publishing, software, computer, video games and new media, television and radio, visual arts, etc. The number of the industries considered to be part of this new field has been growing, since the inception of the term in the late 1990s. In a variety of countries, particularly in the European Union (EU), creative industries account for a substantial share of the gross domestic product (GDP), employment, number of firms, and exports. The growth of creative industries in the EU-25 was 12% higher than the growth of the overall EU economy. Creative industries also outpace many other traditional sectors in terms of growth of jobs or sales [1]. Creative industries show higher resistance to economic downturns, and are considered as the new lever for industrial revival in stagnant or deteriorating economic conditions, since the most important resource necessary for developing creative industries is the capacity of humans to create new and novel ideas, which is virtually

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unlimited. From 2009 to 2015, Croatia, the latest entrant to the EU, has been experiencing six years of economic downturn. Creative industries, which account for 2.3% of the total GDP, and 3% of the total employment [2], have been discussed as the important driver of economic recovery. In contrast, the average share of creative industries in GDP for the 27 countries within the EU is double that (4.2%), whereas the contribution to employment is almost the same. Although the performance of creative industries in Croatia seems to lag behind the EU, their economic contribution is only slightly below the contribution made by the food industry [2]. The most dynamic and prominent among the creative industries in Croatia are publishing, broadcasting, software programming and advertising. However, aggregate national indicators of the creative industry in Croatia provide only limited analytical or empirical insights into how firms in creative sectors actually grow, which seem to be a topic worthy of further investigation.

B. Creative Industries Commonalities and Structure

Creative industries, although quite heterogeneous, seem to have commonalities that separate them from other traditional sectors. These common characteristics include: considerable uncertainty of demand, volatility of customers, higher risks due to the collective nature of creative production processes, a short and often finite time frame for diverse creative activities, infinite variety and durability of the creative outputs' ability to extract economic rents (for example copyright payments) long after the period of production [3]. The high uncertainty, strong volatility of the markets and higher risks call for specific organizational structures and strategies.

One of the most pertinent characteristics of creative industries are its fragmented structure with large numbers of micro or small firms, missing middle-sized firms and a few large firms. Micro and small firms dominate the performance of creative industries and make a major contribution to overall turnover of creative industries. The fragmentation of creative industries is further reinforced by specific employment modes, which include self-employment, ad hoc, freelance and project engagement. These models of employment are considered to be appealing formats of operating in creative industries because they allow for less formalized administration and higher flexibility in responding to opportunities or uncertainty of demand [4], [5].

A firms' reluctance to grow beyond a certain size in terms of annual turnover or employee numbers is considered as one way to mitigate high risks [6]. In addition, small and medium-sized firms in creative industries are more likely to 'grow' through mergers, acquisitions and strategic alliances [7], unlike the firms in other sectors. The growth of the entire creative industry, as an aggregate sector, depends on the constant inflow of new firms, since the survival rate of startups is low [8].

In order to compete, firms in creative industries emphasize the introduction of novelties. Some studies find that creative industries have higher innovativeness in comparison to manufacturing or service sectors, higher technological advancement, higher educated workers, and niche orientation [9], [10]. Networks and collaboration have proved to be positively related with creativity, access to clients, access to creative workers, and for a propensity of novel products that allow a micro and small firm to differentiate themselves in highly competitive markets [11].

The durability of creative industry products is closely associated with higher investments in intellectual property, intangible assets, and the education of employees [12], [13].

The majority of the findings in this section derive from case studies and other types of qualitative research. Verification of the validity of creative industries commonalities and more empirical evidence across creative industries and different countries continues to be rare. The purpose of this paper is to explore whether these characteristics represent actual features of creative industries in Croatia.

C. Understanding Growth – Firm-Level Perspective

The growing body of literature attempts to develop reliable models of predicting firm's growth in order to help entrepreneurs achieve greater control over a firm's long-term sustainability. In addition, growth prediction is often part of the policy-makers agendas, as growth is often perceived as closely related to business success. However, it is becoming more apparent that growth is a highly complex phenomenon which involves a huge number of determinants. Recently, in addition to productivity, efficiency and other types of quantitative discourses, the growth of firms has become increasingly related to innovation, research and development, design, brand, human capital, organizational systems and other intangible assets, neither of which are easy to identify or measure [14]. At least three of the research strands in the vast literature related to growth offer information that is relevant for the exploration of high-growth in creative industries.

Among the studies which explore the micro factors of a firm's growth, one study indicated the relevance of 35 such factors categorized in three broad sets of: (i) characteristic of the entrepreneur (gender, age, education, previous experience,…), (ii) firm characteristics such as age or size, industry affiliation, and (iii) characteristic of strategies or operational processes [15], [16]. A number of studies address the interrelatedness of growth, survival, success, sustainability, exit and failure, etc. [14]. Multiplicity of growth modes requires a multidimensional approach to examine the relationship between growth and its effects [17]-[19]. Finally, the third strand of research explores the impact of theoretical and methodological choices in progressing knowledge on growth [20], [21].

Higher availability of open, longitudinal datasets which reflect the entire population of firms enables scholars to develop and test more robust models of company growth. In order to examine the factors related to growth at a company level, an increasing number of research studies use open access datasets. These datasets are usually provided by national and international institutions, financial agencies or national statistics bodies which gather the data through surveys of households, business establishments,

entrepreneurship, and firm financial accounts, etc. For example, [22] uses financial capital as a predictor of the high- or marginal growth and confirms that the predictive model of growth developed on such data is surprisingly good. The significant relationship between balance sheet ratios and high-growth are valuable since it enables managers to predict which enterprises are better candidates for a high growth path [23]. The same study points out that enterprise size, enterprise age and, primarily, internal cash flows (regardless of bank loans), are particularly relevant factors related to growth and success of the firm. Furthermore, there is evidence of a negative relationship between a tendency for external financing and growth. In the context of transition countries, enterprise growth is determined not only by size and age, but also by other factors such as indebtedness, internal financing, future growth opportunities, process and product innovation, and organizational changes [24]. Interestingly, specific performance indicators (for instance return on sales, return on assets, etc.) have significant interrelations that are also worthy of further investigation in predicting growth [25]. In conclusion, firm size, age and industry affiliations are emphasized as an important factors related to the growth of firms. The size-growth, age-growth, and industry-growth relationship are both supported and rejected [26].

The growth-related literature provides inconclusive results on the growth relationship with other important features, such as opportunity recognition, survival and sustainability. However, there is circumstantial evidence that high-growth firms generate a large share of all net new jobs. In particular, evidence on the relationship between high-growth and economic cycles; the age of the firm or its size, seems to be interesting. High-growth firms continue to grow even in recessionary periods. Younger firms are more likely to experience high-growth. Smaller firms are more flexible and are able to discover new opportunities, and therefore be more likely to experience high-growth bursts more frequently. In contrast, large firms are often slower to react, as the decision-making authorities are further away from the market [13]. High growth is positively related with long-term survival and net employment. A recent study confirmed that firms which experience multiple instances of high growth significantly increase their chances for surviving [27], [28].

The heterogeneous nature of the growth itself warrants exploring, the multiple determinant factors and variety of growth measures. The relationship between the determinants and growth measures (such as sales, employment, or assets) prove the weak correlation. Accordingly, this paper presumes that different growth indicators have different relationship to the key influencing factors [21].

D. High Growth in Creative Industries

High-growth related research is focused on firms with more than 10 employees, and with annual growth rates in sales, employment or assets higher than certain thresholds, for instance 20% or more for at least a three-year period. Due to the high number of micro-sized firms (with zero to nine employees) in creative industries, the question of the propensity of firms to achieve high growth across creative industries are rare.

One of the rare longitudinal and comprehensive studies on high growth in variety of sectors in the UK confirms that creative industries have a greater percentage of high growth firms. The share of the high-growth firms in creative industries in the UK amounts 7.5% in comparison to 6% in total population of UK firms [29]. However, high-growth firms in creative industries have not been tested for the validity of different growth measures. For example, the most preferred measure of the growth is assumed to be growth of sales. This indicator is driven by demand for the firm's products and services and is highly appealing to entrepreneurs [20]. Furthermore, sales figures are relatively easy to obtain and reflect both short-term and long-term changes in the firm. On the other side, it should be noted that policy makers or other stakeholders (financial institutions, investors) may perceive other measures of growth equally important. There is an indication that knowledge intensive industries may grow significantly in employment before any significant sales are made. In contrast, the technology intensive firms may significantly grow assets before sales [20].

This paper aims to explore the interaction between relevant predictors of high growth across creative industries using sales, employment and assets growth as separate high-growth constructs. Bearing in mind findings from literature and previous research we presume the following:

i. There is a difference in predictors of high growth between creative industries and overall economy. Following mainly qualitative evidence related to the commonalities of firms across creative industries we expect to find significant differences between high-growth predictors in models designed for creative industries and the overall economy.
ii. There is a difference between the growth predictors among the various growth constructs (sales, employment, and assets).

The richer empirical evidence on growth models and growth determinants will benefit the more detailed knowledge accumulation related to growth potential of creative industries.

III. Methodology

A. Dataset and Samples

The high-growth prediction model of SMEs in Croatia utilizes the register of financial statements of publicly and privately-owned SMEs in the country provided by the Financial Agency. This dataset includes 53,434 SMEs active between 2008 and 2012. SMEs are categorized according to the Croatian equivalent of NACE-Rev.2, four-digit numerical classes of industries. Following [30], we have selected a total of 40 industrial categories from the NACE-Rev.2 classification as creative industries. The total number of micro, small and medium-sized firms in creative industries is 3,965.

In order to develop and test a predictive model for creative and overall industries, we used several samples from the total

population of micro, small and medium-sized firms in Croatia. Table I shows sizes and structure of samples derived from the dataset.

TABLE I
SAMPLES' SIZES

	Sales growth	Employment growth	Assets growth
Creative Industry			
Total no. of firms	3,468	2,571	3,965
High-growth firms	270	83	275
Non high-growth firms	3,198	2,488	3,690
Developing sample	230	60	230
Testing sample	40	23	45
Overall Economy			
Total no. of firms	43,350	33,910	53,430
High-growth firms	3,471	1,106	3,088
Non high-growth firms	39,879	32,804	50,342
Developing sample	3,150	1,000	2,800
Testing sample	321	106	288
High-growth firms in creative industries	7.78%	3.23%	6.93%
High-growth firms in overall economy	8%	3.26%	5.78%

B. Variables

Three models were tested using the three separate growth measures: sales, employees and assets. All dependent variables are binomial, indicating a firm as high-growth if it has annualized growth in sales, employment or assets greater than 15% a year, over a three-year period from 2010 to 2012. Otherwise, the firm is defined as non-high growth.

Independent variables (in the form of financial ratios) for the high-growth prediction model are created for every enterprise in the sample for years 2008, 2009 and 2010. We calculated the percentage change of the ratios for the 2008 to 2009 and for the 2009 to 2010 periods. In total, 131 variables were created. The best models were developed with the ratios calculated for 2010. The list variable codes of the selected financial ratios and their descriptive statistics is presented in the Appendix (Tables V and VI).

C. Methods

In this study, the forward and backward selection procedures were used to choose the independent variables [31]. The backward procedure starts with putting all the variables into the model and leaving out the variable with the lowest p-value. This step is repeated until the desired number of variables is obtained. The forward procedure starts with choosing one variable with the lowest p-value and adding it to the model. Variables are added one by one, again each with the lowest p-value, until the desired number of variables is reached [32]. In order to get a more stable model, correlation between various variables chosen for the model was taken into account.

After acquiring the r independent variables $x_1, x_2, \dots x_r$, $r \in \mathbb{N}$, and the dependent variable y - 1, if the enterprise is high growth, 0, otherwise, regression is started in which the goal is to obtain coefficients $\beta_i,\ i = 1,2, \dots, r$. Since the dependent variable is binominal, logistic regression will be used. The end result should be a u function that will predict the probability that an enterprise will become high growth. It takes the following form:

$$p = \frac{e^{\beta_0+\beta_1 x_1+\beta_2 x_2+\cdots+\beta_r x_r}}{1+e^{\beta_0+\beta_1 x_1+\beta_2 x_2+\cdots+\beta_r x_r}} \quad (1)$$

To estimate the unknown coefficients $\beta_i,\ i = 1,2, \dots, r$ a linear form is preferable and this is achieved by using logistic transformation:

$$logit(y) = \ln\frac{p}{1-p} = \ln e^{\beta_0+\beta_1 x_1+\beta_2 x_2+\cdots+\beta_r x_r} = g(x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_r x_r \quad (2)$$

By denoting y_i to be realisations of the dependent variable, and $x_i{}' = (1, x_{i,1}, \dots, x_{i,r})$ to be observed corresponding r explanatory variables, where $i = 1, \dots n$ and n being the sample size, the probability density function of Y is:

$$f(y_i|\beta) = p_i^{y_i}(1-p_i)^{1-y_i} \quad (3)$$

where $p_i = \frac{e^{g(x_i)}}{1+e^{g(x_i)}}$ [33]. For the entire sample likelihood function conditional on $\boldsymbol{x_i}$ is:

$$L(\beta|\boldsymbol{y}) = \prod_{i=1}^{n} p_i^{y_i}(1-p_i)^{1-y_i}. \quad (4)$$

In order to simplify maximizing (5), the logarithm of it is used:

$$\ln L(\beta|\boldsymbol{y}) = \ln \prod_{i=1}^{n} p_i^{y_i}(1-p_i)^{1-y_i} = \sum_{i=1}^{n} \ln p_i^{y_i}(1-p_i)^{1-y_i} = \sum_{i=1}^{n} y_i \ln p_i + (1-y_i)\ln(1-p_i) \quad (5)$$

Further steps in maximizing (5), include partial differentiation, but there is no analytical result for β. The solution is obtained using iterative processes [34].

To choose from a number of models which one is the best, some tests were conducted. One measure of model quality is the ROC (receiver operating characteristic) curve. It is based on the measure of true positive rate and the false positive rate, calculated from

$$tp\ rate = \frac{\text{Positives correctly classified}}{\text{Total positives}}$$

$$fp\ rate = \frac{\text{Negatives incorrectly classified}}{\text{Total negatives}} \quad (6)$$

for all possible cutoffs. The curve is obtained by plotting $tp\ rate$ on the y axis by and $fp\ rate$ on the x axis. The more the curve is concave the better model. To number terms, the area under the ROC curve ranges from 0.5 to 1 [35].

One test that was used is KS (Kolmogorov-Smirnov) statistic [36]. It is defined by the function:

$$KS = \max_{a\in[L,H]} \left| F_{m_2,BAD}(a) - F_{m_1,GOOD}(a) \right| \quad (7)$$

where L and H are, respectively, the minimum and maximum values of scores from the observed model, and $F_{m_2,BAD}$ and $F_{m_1,GOOD}$ are defined as:

$$F_{m_1,GOOD} = \frac{1}{m_1}\sum_{i=1}^{m_1} I(s_i \le a \;\&\&\; y_i = 1)$$

$$F_{m_2,BAD} = \frac{1}{m_2}\sum_{i=1}^{m_2} I(s_i \le a \;\&\&\; y_i = 0) \quad (8)$$

where I is the indicator function, 1 if all its conditions are met, 0; otherwise, s_i is the score of the $i-th$ client, and m_1 and m_2 are the number of high and non-high growth firms, respectively.

IV. Results

We developed and tested three models for predicting high growth using *sales*, *employment*, or *assets* as the dependent variable. The high-growth prediction models are compared in two different settings (creative and overall industries).

TABLE II
SALES GROWTH PREDICTION MODELS

Creative Industries		Overall Economy	
Variable code[a]	Regression coefficient	Variable code[a]	Regression coefficient
Liquidity ratios			
l_cash	0.002	kimokob	0.001
Turnover ratios			
t_trta	0.001	t_casa	0.004**
t_sawc	0.002*		
Leverage ratios			
		z_tdeq	$4x10^{-5}$
		z_blta	0.138*
Profitability ratios			
p_nisa	0.03	p_reta	-0.008*
Control variables			
c_tech	0.353*	c_trem	$5x10^{-7}$
c_ntan	0.431	c_ntan	1.067***
Accuracy measures			
Total hit rate:	57.5%		54.51%
Growth hit rate:	62.5%		55.37%
Non-growth hit rate:	52.5%		53.73%
AUC:	0.596		0.575
KS:	22.5%		15.11%

[a] description of variable codes is given in the Appendix (Table V); statistical significance ***1% **5% *10%

Table II represents logistic regression coefficients for prediction of high-growth in *sales*, for creative industry and for overall economy.

High growth in *sales* in *creative* industries is positively related to cash, total asset turnover, value added, high-tech intensity, and intangible assets. In comparison with the high-growth predictors in *overall economy* there is one similarity. The only determinant found in both settings (creative or overall economy), of the *sales' model* is investments in intangible assets. This supports our presumption that creative industries have distinctive characteristic which separate them from the overall economy, and allow treating them as the aggregate sector. In addition, the determinants that are significant in creative industries are in line with the commonalities suggested by [9], [10], [12], [13].

Table III shows specifics for high-growth prediction where we use *employment* as the measure of growth.

Results indicate that high propensity to grow in *employment* in the *creative* industries is determined by the faster collection of receivables, higher profitability ratios, higher bank indebtedness, higher investments in intangible assets, and higher productivity of employees. In contrast, high growth in the *overall economy* is determined by five other factors, and only two of these factors overlap. Higher bank indebtedness, and productivity per employee are important determinants for both models: creative and overall industries.

TABLE III
EMPLOYEE GROWTH PREDICTION MODELS

Creative Industries		Overall Economy	
Variable code[a]	Regression coefficient	Variable code[a]	Regression coefficient
Turnover ratios			
t_coll	-0.001	t_trca	0.008*
		t_sata	0.043*
		t_casa	-0.001
Leverage ratios			
z_tdta	0.173	z_blta	0.189
z_blta	1.675*		
Profitability ratios			
p_pm	0.016*	p_roa	0.001**
p_roe	0.005*	p_reta	-0.01
Control variables			
c_trem	$1.03*10^{-7}$	c_trem	$2*10^{-7}$***
c_ntan	1.35		
Accuracy measures			
Total hit rate:	65.21%		60.78%
Growth hit rate:	65.21%		60.79%
Non-growth hit rate:	65.21%		60.78%
AUC:	0.618		0.611
KS:	30.44%		22.55%

[a] description of variable codes is given in the appendix (Table V); statistical significance ***1% **5% *10%

Table IV shows two high-growth prediction models developed and tested with *assets* as the measure of growth.

The results show there is a difference between the predictors of *assets'* growth among creative and overall industries. *Creative industries* growth in assets is determined by higher cash and receivables, higher total assets turnover, lower bank loans, higher reinvestments of retained profit. Furthermore, high-tech firms in the creative sector have a higher potential for growth. The predictors of the high growth in assets in the *overall economy* model are different. For example, the two models overlap only in two determinants: retained earnings and higher leverage.

In conclusion, we confirm that the high growth of the firms in creative industries is predicted by a specific set of determinants, different from predictors for the overall economy.

In order to prove the second presumption, we explore the differences in determinants and growth relationship using three growth measures (sales, employment, and assets). The results presented in Tables II-IV, confirm there are the differences in the predictors of sales, employment, and assets in creative industries.

All of the models using sales, employment, and assets as measures of growth are positively related to the high-tech intensity investments in intangible assets and generated cash that are in line with the literature reviewed. On the other hand, there are few significant differences in the other determinants, depending on the measure of growth. High growth in employment or assets is significantly related to leverage ratios. Interestingly, growth of sales is not related to any of the leverage ratios. High growth in assets, similarly to sales, is determined by total turnover ratios, whereas high growth in employment is better predicted by turnover of receivables collected. In addition, to highlight another difference, high growth in employment and sales are determined by value added, unlike the high growth of assets which is better predicted by the reinvestment of retained profits.

TABLE IV
ASSETS GROWTH PREDICTION MODELS

Creative Industries		Overall Economy	
Variable code[a]	Regression coefficient	Variable code[a]	Regression coefficient
Liquidity ratios			
l_incl	0.011*	l_cata	0.938***
		l_cacl	0.01
Turnover ratios			
t_trta	0.17***	t_trfa	0.001
		t_coll	-0.001***
Leverage ratios			
z_tdta	0.008	z_tdta	0.048*
z_blta	-0.855*		
z_cleq	-0.002		
Profitability ratios			
p_reta	-0.03	p_reta	-0.074*
Control variables			
c_tech	0.153	c_ntan	0.927**
Accuracy measures			
Total hit rate:	55.06%		54.86%
Growth hit rate:	55.56%		55.99%
Non-growth hit rate:	54.55%		53.81%
AUC:	0.617		0.572
KS:	26.26%		15.53%

[a] description of variable codes is given in the appendix (Table V); statistical significance ***1% **5% *10%

V. DISCUSSION

The share of high-growth firms in creative industries is above average compared to the overall economy in Croatia, hence supporting the results obtained elsewhere and indicating that growth trajectories of firms in creative industries may indeed be worthy of more detailed exploration.

One of our major findings reveals that firms in creative industries are expected to have high growth allied to investment in intangible assets (such as patents, copyrights, investments in training, etc.), productivity and affiliation to high-technology sectors. Our models portray a significant positive relationship between high growth and investment in intangible assets and hence, in part, support the existence of commonalities across creative industries. Another supporting factor in line with the literature review is revealed through the absence of leverage ratios as the significant determinant of sales. Micro, small and medium-sized firms are often faced with difficulties in securing access to bank credit or government financial incentives. Firms in creative industries, due to the intangible character of their products or services, faced the same barrier, and need to lean on capital or internal sources of financing, or scale their growth to their internal resources. The percentage of micro, small and medium-sized firms involved in any form of high growth is 12.64%. The share of high-growth firms in overall economy is 11.69% (that is significantly lower in comparison to creative industries at 10%). The selection of the growth measure, as expected, affects the likelihood of high growth in creative industries. Only 2.2% of high-growth firms experience growth in sales, employment, and assets at the same time. By assessing the different measures of growth in creative industries, we confirm the differences between key determinants and selection of growth measures. Fig. 1 illustrates the interrelationship of high-growth determinants for the three different growth measures.

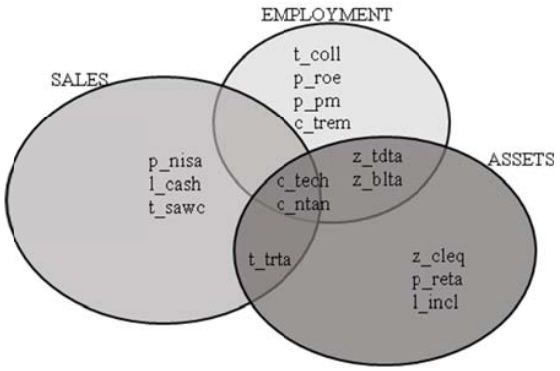

Fig. 1 Multifaceted high-growth determinants in creative industries

We argue that creative industries, due to their knowledge intensity or dependencies with technology, may exercise a particular sequence of growing. For example, firms may grow significantly in assets or employment before sales. Our findings indicate that growth of the assets and growth of the employment are significantly related to leverage ratios. This confirms that firms with more assets or more employees are more likely to get a loan or to use debt as a source of financing.

VI. CONCLUSION

National mapping- and macro survey-based studies emphasize a relatively new economic construct - namely

creative industries, as fast growing, sizable and important drivers of industrial or economic growth.

Evidence of high growth in creative industries, in general, though highly optimistic, is difficult to find. Research related to high growth is focused on firms that employ 10 or more people. Creative industries with a disproportionally higher percentage of self-employed owners and micro-firms with less than 10 employees are usually neglected. In contrast, we presume that high growth as a complex phenomenon is worthy of a more quantitative approach, even for the micro-sized firms.

Our study extends previous findings, since to the best of our knowledge, we offer more robust, empirical evidence on alleged commonalities and growth potential of micro, small and medium-sized firms in creative industries in Croatia. Croatia, faced with prolonged economic downturn, needs a more detailed understanding of how firms in creative industries actually grow and how to assist and take full advantage the full potential of creative industries.

We use a methodological approach that can be easily adapted to different national settings and customized for different unit of analysis, and hence, contributes to scholars and researchers. In addition, we provide circumstantial, inconclusive, evidence of the relationship between the performance indicators and the micro, small and medium-sized firms' propensity to achieve high growth. In such a way, it contributes to the validity of the empirical evidence and the conceptual frameworks suggested by the literature in regard to the alleged commonalities of creative industries and their distinctiveness from other economic sectors. However, our approach has limitations. The methodology that we use, namely logistic regression and datasets of financial ratios, need to be interpreted with care. The variety of business decisions and circumstances are subsumed in profitability, liquidity, turnover and leverage ratios. They are considered as lagging performance measures and therefore allow us only to comment on relevance and the propensity of a particular performance ratio. In addition, the definition of a high-growth measure is somewhat arbitrary to ensure a sufficient sample size. Therefore, further investigation should consider a number of other soft variables and more robust methods of analysis that will add more interpretability to the designed models.

APPENDIX

TABLE V
VARIABLE CODES AND DESCRIPTIONS

Variable code	Variable description
Liquidity ratios:	
l_cacl	Current assets/current liabilities
l_incl	(current assets-inventory)/ current liabilities
l_cata	Current assets/total assets
l_cash	Cash/current liabilities
Turnover ratios:	
t_trta	Total revenue/total assets
t_trfa	Total revenue/fixed assets
t_trca	Total revenue/current assets
t_sata	Sales/total assets
t_sawc	Sales/net working capital
t_csal	(Current assets-inventory)/sales
t_coll	365/receivables turnover
t_pay	365/payables turnover
t_inv	Sales/inventory
t_casa	Current assets/sales
Leverage ratios:	
z_tdta	Total debt/total assets
z_tdeq	Total debt/equity
z_blta	Bank loans/total assets
z_eqta	Equity/total assets
z_loca	Long-term debt/current assets
z_cleq	Current liabilities/equity
Profitability ratios:	
p_nisa	Net income/sales
p_pm	Net income/total revenue
p_roa	Net income/total assets
p_roe	Net income/equity
p_reta	Retained earnings/total assets
Control variables:	
c_ntan	Non-tangible assets/total assets
c_tech	High-tech industry
c_trem	Total revenue/total number of employees

TABLE VI
DESCRIPTIVE STATISTICS OF THE FINANCIAL RATIOS FOR CREATIVE INDUSTRIES

Var. code	Asset Median (IQR)		Employees Median (IQR)		Sales Median (IQR.)	
	High	Non-high	High	Non-high	High	Non-high
Liquidity ratios						
l_cacl	1.27 (2.17)	1.21 (2.23)	1.31 (1.53)	1.28 (1.84)	1.16 (1.69)	1.69** (1.85)
l_incl	1.17 (2.19)	0.98 (1.99)	1.2 (1.5)	1.1 (1.93)	1.37 (1.8)	0.99** (1.55)
l_cata	0.84 (0.36)	0.75*** (0.48)	0.78 (0.33)	0.76 (0.45)	0.78 (0.39)	0.81 (0.35)
l_cash	0.19 (0.72)	0.14* (0.54)	0.19 (0.6)	0.12 (0.54)	0.16 (0.71)	0.15 (0.71)
Turnover ratios						
t_trta	1.78 (1.99)	1.15*** (1.56)	1.65 (1.33)	1.49* (1.17)	1.23 (1.35)	1.08** (1.34)
t_trfa	11.75 (29.91)	5.4*** (16.71)	9.33 (15.23)	5.25 (21.9)	5.27 (16.1)	7.56 (15.58)
t_trca	2.64 (2.88)	1.86*** (2.46)	2.53 (1.98)	2.28 (2.09)	1.68 (2.03)	1.92** (2.24)
t_sata	1.67 (1.88)	1.1*** (1.48)	1.63 (4.28)	1.19* (1.24)	1.03 (1.33)	1.17** (1.3)
t_sawc	1.62 (7.45)	0.93 (4.77)	2.71 (9.89)	1.61 (8.9)	1.65 (5.31)	1.65** (5.12)
t_csal	0.34 (0.42)	0.45*** (0.6)	0.38 (0.34)	0.41 (0.45)	0.57 (0.84)	0.49 (0.61)
t_coll	43 (80)	65*** (112)	70 (89)	78 (109)	74 (144)	76 (110)
t_pay	41 (126)	69** (112)	75 (128)	94 (167)	66 (228)	94 (196)
t_inv	17.66 (86.6)	6.71*** (48.03)	14.3 (63.7)	21.73 (63.4)	6.97 (24.4)	13.34** (39.4)
t_casa	0.38 (0.45)	0.54*** (0.79)	0.41 (0.39)	0.53 (0.52)	0.63 (1.18)	0.58** (0.74)
Leverage ratios						
z_tdta	0.66 (0.72)	0.66 (0.63)	0.7 (0.43)	0.62 (0.59)	0.75 (0.6)	0.59** (0.51)
z_tdeq	0.39 (2.72)	0.59 (2.53)	1.79 (3.85)	0.87** (2.14)	0.74 (3.2)	0.73 (1.79)
z_blta	0 (0)	0** (0.03)	0 (0.15)	0 (0.06)	0 (0)	0** (0.06)
z_eqta	0.33 (0.72)	0.32 (0.62)	0.25 (0.43)	0.32 (0.51)	0.23 (0.57)	0.38** (0.5)
z_loca	0 (0)	0** (0.11)	0 (0.33)	0 (0.19)	0 (0)	0** (0.19)
z_cleq	0.36 (1.68)	0.51 (1.96)	1.11 (3.45)	0.68* (2.02)	0.59 (2.69)	0.63 (1.49)
Profitability ratios						
p_nisa	0.02 (0.12)	0.02 (0.13)	0.03 (0.09)	0.02* (0.07)	0.03 (0.11)	0.01* (0.14)
p_pm	1.46 (17.67)	1.67 (12.82)	2.74 (8.44)	1.11* (9.25)	1.38 (25.8)	2.7** (13.01)
p_roa	2.97 (31.29)	1.54 (14.06)	5.13 (15.32)	1.34** (13.96)	1.24 (21.1)	3.17** (45.6)
p_roe	16.01 (56.3)	9.29** (38.82)	21.85 (67.27)	9.32*** (49.9)	13.5 (51.2)	13.72 (45.1)
p_reta	0.04* (0.45)	0.07 (0.4)	0.07 (0.21)	0.13 (0.41)	0.05 (0.38)	0.12 (0.35)
Control variables						
c_ntan	0 (0)	0 (0)	0 (0.007)	0 (0.001)	0 (0)	0 (0.01)
c_tech	86.8%	79%***	85.4%	78%	85.6%	79%**
c_trem[a]	2.3 (2.73)	2.26 (2.99)	3.59 (2.86)	2.43*** (3.81)	1.84 (2.62)	2.5*** (3.07)

[a] in hundreds of thousands kunas (Croatia official currency: 1 EUR=7,67 kn)
statistical significance ***1% **5% *10%

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