Working Capital Management routines in small German craft businesses:

An empirical study of the drivers

of implementation

Benedikt Tratt, Technical University of Munich

2nd EIASM Conference on Management Accounting and Control in SMEs

Online, April 16th, 2021

In both academia and among business owners working capital management in the German craft SME sector suffers from a lack of data and a lack of awareness

Motivation

Academia

- Small firm's access to financial markets is usually limited[1]
- They are more likely to face financing constraints[2]
- Current liabilities is most important source of external finance[1]
- SMEs often have a disproportionately high amount of trade receivables in their asset structure[3]

→ Effective management of working capital is especially important and beneficial for small enterprises

But: No empirical data available on actual rates of implementation among German SMEs
(even international evidence extremely scarce & outdated)

Practice

"In my opinion a craftsman should focus on his work on the worksite. That's where his expertise lies and that's where the money is made. I am still under the impression that if things on the worksite run smoothly than your business runs smoothly. Yet, I had to learn the hard way that if you don't play close attention to the office part of your business than you might run out of money even if contracts are flourishing. And that's something I think most people in our industry are not aware of at all."

(Owner of painting company, Interview study "Small craft businesses in times of crisis")

Lack of data

Lack of awareness

[1]Petersen & Rajan (1997) [2]Whited (1992) [3]Hughes (1997)

Overview of presented research project

Summary

Topic & Conversation
- Smaller firms are more likely to face financing constraints (esp. in times of Crisis when banks raise credit hurdles)
- Trade credit makes up large portion of SMEs' asset structure
- Theoretically, SMEs can profit particularly from structured WCM in practice however the topic is lacking awareness

Prior research & gap
- Prior works on management control system adoption in SMEs is usually grounded in resource-based theory
- Focus is mainly on relation of reported WC figures and firm performance
- Gaps with regard to actual WCM practices and very small companies

Research focus
- Factors associated with the adoption of working capital management routines in small German craft businesses and their relationship with firm liquidity and performance

Data & method
- Online questionnaire and financial data from over 200 small craft companies from all industry sectors
- 3-step research approach with exploratory factor analysis, partitioning cluster analysis and multinomial logit regression

Findings & Contribution
- Rather than constraints in human resources financial literacy and awareness of key personnel drive WCM routine implementation rates among SMEs
- Even the most resource constraint firms can implement structured WCM routines in such a way that it positively affects both firm liquidity and profitability

Literature on WCM in the SME sector is neglecting firm diversity and focuses too much on observable KPIs instead of actual WCM practices

Existing findings

WCM is positively associated with performance…
- Relation between WC levels and SME performance follows an inverted U-shape[1]
- There are optimal levels for all WC figures[2]

[1]Banos-Caballero et al. (2014), Atkas et al. (2015), Ben-Nasr (2016)
[2]Nadiri (1969), Emery (1984), Ek & Guerin (2011)

Research gaps

…but the focus is only on reported WC figures
- The actual practices by which these figures have been achieved are not considered
- Research looking only at the outcome and neglecting the means is of little practical value to managers

…but most research is looking only at global measures of WC
- By looking at measures like the CCC, it is implicitly assumed that firms have the skills and resources manage all WC components simultaneously
- Contradicting current findings in small firm management research

Small firms are less likely to take-up WCM routines…
- Seems to be due to constraints in time and personnel resources[3]
- Small firms tend to apply strict cost-effort considerations regarding their investment in management control systems[4]

[3]Peel & Wilson (1996), Howorth & Westhead (2003)
[4]Reid & Smith (2000), Howorth & Westhead (2003), Hill et al. (2010)

…but prior work does not account for diversity among SMEs
- Instead, small firms are usually considered to be a homogeneous entity
- Unclear what drives the differences in take-up rates

…but samples are usually focusing on medium-sized enterprises
- Average firm size usually triple digits
- Very small firms are neglected

Due to a multistage research approach, the study is able to answer three distinct research questions regarding the working capital management practices of small businesses

Research focus

Call for research: Lopez & Hiebl (2015), JMAR

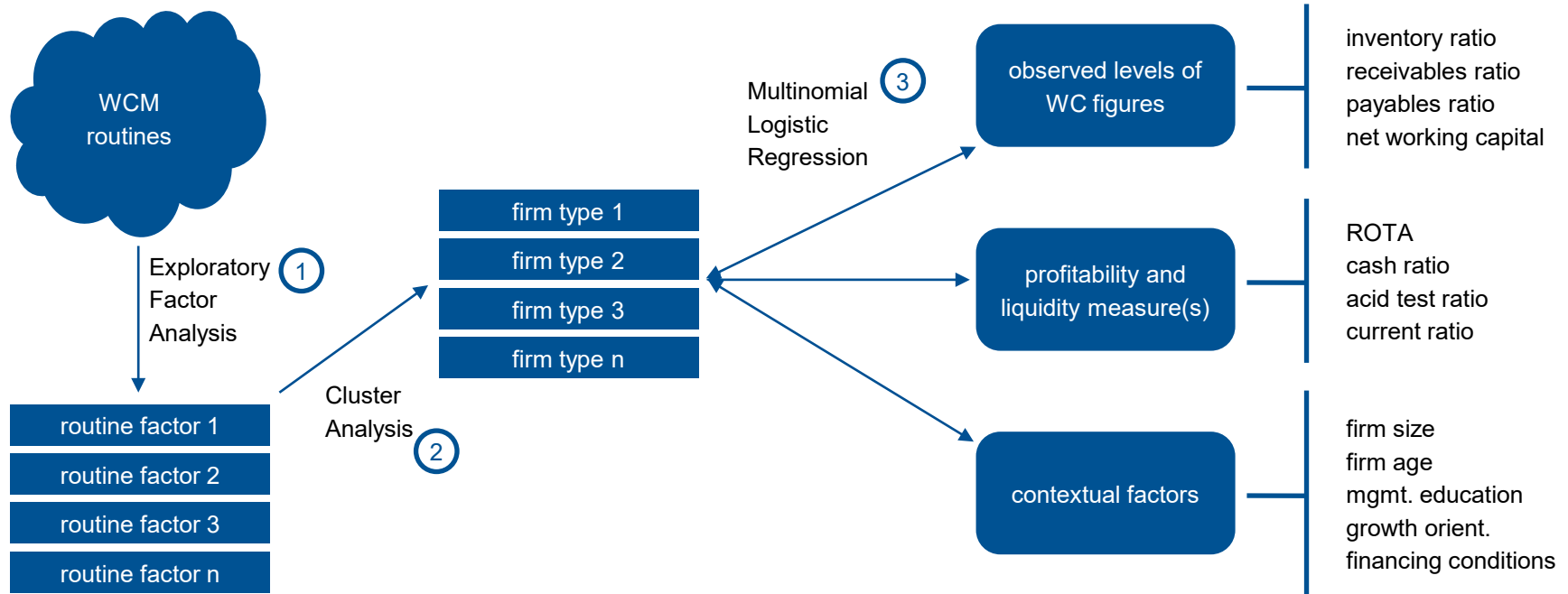| Research area	Research question	Contribution to literature
Status Quo of WCM routines in small craft businesses	Are there different types of craft businesses with regard to the utilization of working capital management routines?	• Organizational literature on small firm universe (homogeneity vs. heterogeneity) • Empirical data generation
Drivers of WCM routine implementation in small craft businesses	What contextual factors can be associated with the propensity of implementing working capital management routines in small craft businesses?	• General working capital management literature: routines / drivers of implementation • Small firm literature: management & decision-making
Impact and effectiveness of WCM routines in small craft businesses	Is the take-up of working capital management routines impacting the firm objectives of profitability and liquidity?	• General working capital management literature: impact • Small firm literature: finance

The study employs a 3-step research approach to provide a holistic view on the status quo, drivers and implications of WCM practices in (very) small businesses

Research approach

WCM routines

Exploratory Factor Analysis ①

routine factor 1
routine factor 2
routine factor 3
routine factor n

Cluster Analysis ②

firm type 1
firm type 2
firm type 3
firm type n

Multinomial Logistic Regression ③

observed levels of WC figures

inventory ratio
receivables ratio
payables ratio
net working capital

profitability and liquidity measure(s)

ROTA
cash ratio
acid test ratio
current ratio

contextual factors

firm size
firm age
mgmt. education
growth orient.
financing conditions

Combination of companies' subjective assessment of their working capital management practices with objective financial data to prevent single-source bias
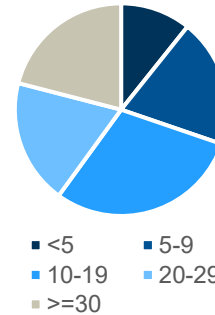
Sampling

Online questionnaire

- 12 items on frequency of application of stock, credit and cash management practices (fully verbalized 5-point Likert scale
- Information on company demographics and contextual variables
- Invitation link emailed to owner / manager of 1500 randomly selected German small craft businesses (<50 emp.); reminder sent two weeks later
- N = 205 after disregarding responses with excessive missing data (effective response rate = 14.4%)
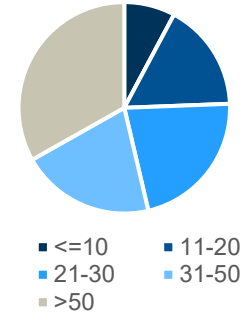
Financial data

- Necessary to calculate various working capital measures
- Obtained from German *Bundesanzeiger*
- Reporting date: EOY 2018
- Selection of figures subject to data availability considerations
- Total assets, inventories, receivables, cash & equivalents, payables, current and long-term liabilities, annual net profit
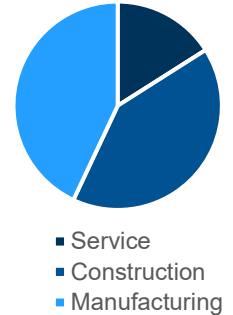
No. of employees

- <5
- 5-9
- 10-19
- 20-29
- >=30

Firm age

- <=10
- 11-20
- 21-30
- 31-50
- >50

Industry

- Service
- Construction
- Manufacturing

	Q_1	Mean	Median	Q_3
Total assets [m€]	0,345	1,566	0,693	1,612
ROTA [%]	0,01%	3,69%	2,77%	8,59%
Current ratio	1,27	3,84	2,02	4,31
Inv. ratio	0,06	0,25	0,16	0,38
Rec. ratio	0,13	0,27	0,23	0,37
Pay. ratio	0,12	0,28	0,25	0,42

Reported utilization of WCM routines is generally very high with focus on basic inventory and invoicing management. However, there is still a significant number of firms that do not practice any kind of WCM at all.

Data

Routine	Never	Case-wise	Occasionally	Periodically	Frequently	Mean
Inventory levels	11.71	12.20	14.15	44.39	17.56	3.439
Reorder quantity	15.12	11.22	12.68	45.37	15.61	3.351
Inventory turnover	14.63	15.			13.17	3.161
Terms of payment for customers	15.61	9.			20.97	3.410
Invoicing practices	13.66	10.24	13.17	33.66	29.27	3.546
Overdue notices	13.17	14.15	14.15	29.27	29.27	3.473
Bad and doubtful debts	16.58	13.66	16.10	33.66	20.00	3.268
Terms of payment to creditors	16.10	14.63	16.59	32.68	20.00	3.259
Use of cash discounts	18.54	8.29	12.20	26.83	34.15	3.498
Working capital ratio	23.90	16.10	19.51	29.		.878
Liquidity ratios	20.98	13.66	9.76	38.		.171
Cash Conversion	26.83	13.66	19.02	30.		2.829

Note: Respondents were asked "How often do you review or calculate the following figures?".

Focus is on basic inventory and invoicing practices

KPI calculation is still underdeveloped

Results I: EFA

Variable	Description (freuency of review)	Credit focus (factor 1)	Cash focus (factor 2)	Inventory focus (factor 3)	Communality
INV	Inventory levels	0.00	−0.01	**0.96**	0.904
ORDQ	Reorder quantity	0.03	−0.02	**0.94**	0.895
ITO	Inventory turnover	−0.02	0.09	**0.78**	0.678
RECT	Terms of payment for customers	**0.89**	0.04	0.01	0.842
INVO	Invoicing practices	**0.89**	−0.03	0.09	0.874
DUE	Overdue notices	**0.97**	−0.02	−0.06	0.853
BADD	Bad and doubtful debts	**0.93**	0.04	−0.07	0.820
PAYT	Terms of payment to creditors	**0.88**	0.01	0.01	0.799
DISC	Use of cash discounts	**0.88**	−0.01	0.07	0.844
WCR	Working capital ratio	0.01	**0.91**	−0.04	0.807
LIQ	Liquidity ratios	0.10	**0.80**	0.06	0.801
CC	Cash Conversion	−0.06	**0.97**	0.02	0.913
Proportion of variance		0.42	0.21	0.21	
Cumulative proportion of variance		0.42	0.63	0.84	
Eigenvalue		7.65	1.78	1.08	
Cronbach's alpha		0.97	0.94	0.93	

Kaiser-Meyer-Olkin measure of sampling adequacy = 0.907.
Bartlett's test of sphericity = 2859, p-value = 0.000, df = 66.

Factor 1:
Inventory management practices

Factor 2:
Trade credit
(receivables and payables)
management practices

Factor 3:
Cash management practices

Results II: Clustering

Cluster	Size N	Credit focus (factor 1)	Cash focus (factor 2)	Inventory focus (factor 3)	Within cluster SS
High	88	0.689	0.786	0.640	20.956
Inventory / Cash	24	−0.604	0.713	0.329	50.114
Credit	50	0.403	−0.761	−0.041	31.853
Low	43	−1.540	−1.122	−1.446	45.220
Between cluster SS vs. total SS		74.8%			
Pseudo F-statistic		198.535			

Note: Input variables for the clustering algorithm are the normalized factor scores which were estimated using regression based weights.

Assessment of most suitable number of clusters

- Elbow criterion
- Silhouette score
- Gap-statistic
- Pseudo F-Statistic

RQ1: Different types of small firms can be identified using their take-up of working capital management routines as the distinguishing criterion

Results III: Logit model

Reference category	LOW			CREDIT		INV
Variable	HIGH	CREDIT	INV	HIGH	INV	HIGH
EMP	0.023	0.027	0.014	−0.004	−0.013	0.009
	(0.89)	(1.05)	(0.48)	(−0.24)	(−0.60)	(0.46)
AGE	−0.024*	−0.017	−0.024*	−0.007	−0.007	0.001
	(−2.25)	(−1.67)	(−2.10)	(−1.05)	(−0.76)	(0.06)
GROW	1.236	0.600	2.169*	0.637	1.569*	−0.932
	(1.42)	(0.72)	(2.10)	(1.24)	(2.02)	(−1.31)
CRC	−2.835***	−1.597***	−2.986***	−1.238***	−1.389**	0.151
	(−5.82)	(−3.73)	(−4.78)	(−4.01)	(−2.75)	(0.31)
SKILLO	3.873**	3.776**	2.979*	0.097	−0.797	0.894
	(3.10)	(3.07)	(2.25)	(0.23)	(−1.23)	(1.51)
INVR	4.924**	4.626**	−3.641	0.298	−8.266**	8.565***
	(2.79)	(2.73)	(−1.20)	(0.30)	(−3.10)	(3.30)
RECR	2.375	2.007	1.759	0.369	−0.246	0.615
	(1.24)	(1.05)	(0.82)	(0.30)	(−0.15)	(0.41)
PAYR	−0.833	0.581	0.563	−1.413	−0.018	−1.396
	(−0.47)	(0.35)	(0.25)	(−1.24)	(−0.01)	(−0.80)
CASHR	1.038*	1.089*	0.957*	−0.051	−0.132	0.081
	(2.21)	(2.32)	(2.01)	(−0.74)	(−1.16)	(0.76)
ROTA	10.279*	9.656*	8.614*	0.623	−1.042	1.666
	(1.97)	(1.97)	(1.50)	(0.23)	(−0.28)	(0.51)
Constant	2.421	−0.158	3.454*	2.578**	3.611*	−1.032
	(1.70)	(−0.11)	(2.16)	(2.63)	(2.78)	(−0.91)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

Percentage correctly classified	64.878%
Number of Observations	205
Pseudo R-Squared (McFadden)	0.3643
Pseudo R-Squared (Nagelkerke)	0.6585
LR test (model χ^2)	192.06***(36df)

*, **, *** indicates significance at the 5%, 1% and 0.1% level, respectively.
z-values are reported in parentheses.

Core findings

- Human resource constraints alone do not constitute the major barrier to the utilization of WCM practices in small firms

- Firms employing more WCM routines are younger, more financially skilled and have a desire to grow in size

- Credit constrained firms who would profit the most from freeing liquidity through effective WCM are less likely to implement the respective practices

- No evidence that SMEs actually focus their WCM efforts in areas with highest potential benefit, but routine implementation seems to significantly affect observable WC figures

- Implementing WCM routines is associated with superior performance and liquidity (even if focusing exclusively on one aspect of WC)

The study provides several useful implications for small business managers, advisors and researchers.

It its, however, also subject to some limitations which are mainly due to data scarcity.

Implications / Limitations

Implications

Academia

- Further small business management research should refrain from treating the sector as a homogeneous entity
- Resource-based theory is not accurately explaining WCM routine behavior of SMEs
- Additional research should focus on the cause-effect relations of individual WCM practices

Practitioners

- Even in the most resource constraint firms a structured WCM can be implemented cost-effectively and positively affect liquidity and profitability
- Through foresighted hiring and training WCM routine take-up rates can be increased at relatively small costs
- Need for development of accounting-oriented training programs for founders, owners and managers

Limitations

Causality:
- Cross sectional study that cannot establish direct causality – it only provides an indication of associations
- Relationship between performance and WCM is likely subject to endogeneity

Data scarcity:
- Only firms publicly reporting a minimum of financial information could be analyzed
- sole proprietorships and partnerships were not covered

Generalizability:
- Relatively narrow geographical and industry focus of the sample
- Craft sector in Germany is subject to unique cultural and regulatory environment