

# Evolving Business Analytics of Capital Structure and Working Capital Optimization in Serbian MSEs: Correlations and Simulations (2009-2018)

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## ABSTRACT

In Serbian medium-sized enterprises (MSEs) (2009-2018), the study found a 14.8% domestic capital decline offset by foreign capital inflows ( $p < 0.05$ ). With regional disparities, Šumadija achieved 17.34%\*\*\* foreign capital growth, South/East Serbia suffered a -7.13%\*\*\* domestic capital decline. Proximity to Belgrade, as the capital city, significantly correlated with financing success ( $\beta = 0.42$ ,  $p < 0.1$ ). Manufacturing dominated with 10.25%\*\*\* foreign capital growth versus agricultural slump (1.93% ns). WCM optimization yielded 24-day cash conversion cycle reductions and +1.7\*\*\* inventory turnover improvements in manufacturing. Simulations project 8-10% manufacturing growth with optimal WCM. Foreign capital's high variability ( $SD = 6.42$ ) exacerbated regional inequalities, particularly in Vojvodina (-1.28% foreign capital) versus Šumadija's exceptional performance. Findings show foreign capital mitigates domestic capital decline in certain regions while creating new spatial economic imbalances, necessitating regional policies accounting for sectoral composition and WCM infrastructure.

## KEYWORDS

Capital Structure, Compound Annual Growth Rate (CAGR), Econometric Modeling, Medium-Sized Enterprises (MSEs), Regional Disparities, Serbia, Simulation, Working Capital Management (WCM)

## INTRODUCTION

In a previous study, hereafter referred to as Paper I (Vemić, 2015), the author explored whether Serbian medium-sized enterprises (MSEs) employed a systemic approach to working capital management (WCM) during the 2008–2009 period. The study examined a sample of 62 MSEs, representing 2.32% of the total MSE population in Serbia. These enterprises were defined as firms with between 50 and 250 employees, with annual revenues ranging from 2.5 to 10 million Serbian Dinar (RSD) and assets between 1 and 5 million RSD.

Findings confirmed that data-based wisdom optimization of working capital management (WCM) is feasible for MSE, with the organizational structure of finance departments playing a critical role in the optimal allocation of working capital. While WCM can serve as a flexible tool for innovation in financial management and the attraction of venture capital in transitional conditions, MSEs have exhibited a significant lack of WCM applications.

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The rejection of the null hypothesis regarding the regional distribution of MSE potential between Belgrade and Vojvodina underscored the severity of economic disparities in Serbia's peripheral southern regions. This finding suggests a need to explore Modigliani and Miller's (1958) capital structure hypothesis and Fama's (1970) efficient market hypothesis.

In the subsequent paper, hereafter referred to as Paper II (Vemić, 2025), the author analyzed capital structure challenges from 2010 to 2018, covering the entire MSE population (ranging from 2,257 firms in 2010 to 2,517 in 2018). MSEs were defined as those with 50 to 250 employees, annual revenues of €8–40 million, and assets of €4–20 million. Data originated from official small and medium enterprise (SME) reports (Statistical Office of the Republic of Serbia, 2017, 2020), the Law on Regional Development (Serbia Law on Regional Development, 2021), and Nomenclature of Statistical Territorial Units region regulations (Regulation on the Nomenclature of Statistical Territorial Units, 2009, 2010).

The author discovered a novel influence of “MSE concentration and impact” on regional disparities and convergence. The findings suggest that SME-focused regional development policies, particularly those with public-private partnerships (Rakić & Rađenović, 2013), could foster more efficient development—especially in southern Serbia, where the development gap compared to Belgrade is pronounced.

Unlike in advanced economies such as Germany and the United Kingdom, where *Mittelstand* and *Brittelstand* firms can access sophisticated financial institutions, MSEs in the European Union candidate countries remain primarily concentrated in capital cities (Vemić, 2025b). Improving regional access to finance could support the development of rapid-growth firms in these less advanced countries (Fischer & Reuber, 2003; Resmini, 2002).

This article synthesizes the author's findings from two prior studies, providing evidence that links WCM to capital structure within a regional context. It further explores implications, achieving a canonical transformation to correlate financial sources while accounting for approximations derived from earlier research.

## **METHODOLOGY**

### **Introduction and Scope**

Both previous survey periods used precise financial and employee thresholds aligned with European Union and Serbian definitions for MSE. While the 2008–2009 sample was small, the 2010–2018 period covered the total Serbian MSE population. There were no major changes in the MSE criteria between these periods. The author acknowledges that the findings have limited generalizability outside the defined criteria.

Paper I covered only Serbian MSEs, while Paper II made inferences about all European Union candidate transition economies.

### **The Three-Pronged Methodology Framework**

The present research model of the three-pronged methodology concept of the author is presented in Figure 1.

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