

# **Balancing quality and costs in inpatient care**

Kumulative Dissertation

zur Erlangung der Würde des „doctor rerum oeconomicarum“ (Dr. rer. oec.)

an der Fakultät für Betriebswirtschaft

Moorweidenstr. 18

20148 Hamburg

der Universität Hamburg

vorgelegt von Ricarda Milstein

Geboren in Ostercappeln

Hamburg, den 15.02.2021

# Contents

<b>Contents</b> .....	<b>i</b>
<b>List of tables</b> .....	<b>iii</b>
<b>List of figures</b> .....	<b>iv</b>
<b>1 Background</b> .....	<b>1</b>
1.1 Between quality of care and cost containment .....	1
1.2 Research setting, goals, and content .....	3
<b>2 Pay for performance in the inpatient sector: A review of 34 P4P programs in 14 OECD countries</b> .....	<b>4</b>
2.1 Introduction.....	4
2.2 Methods .....	5
2.3 Results.....	11
2.3.1 Aims.....	11
2.3.2 Selection of indicators .....	11
2.3.3 Financial rewards.....	17
2.3.4 Impact of the various P4P programs.....	21
2.4 Discussion and policy recommendations.....	25
2.5 Conclusion .....	32
<b>3 The relationship between nurse staffing levels and nursing-sensitive outcomes in hospitals: Assessing heterogeneity among unit and outcome types</b> .....	<b>34</b>
3.1 Introduction.....	34
3.2 Methods .....	36
3.2.1 Data Description .....	36
3.2.2 Selection of Variables.....	38
3.2.3 Estimation strategy .....	40
3.3 Results.....	41
3.4 Discussion.....	45
3.5 Conclusion and policy recommendations.....	48
3.6 Appendix.....	49
<b>4 A comparison of short-term forecasts to predict German hospital expenditures one year ahead</b> .....	<b>52</b>
4.1 Introduction and background.....	52
4.2 Data.....	54

4.3	Methods .....	54
4.3.1	Investigation of time series properties .....	54
4.3.2	Exponential smoothing .....	57
4.3.3	Seasonal ARIMA.....	59
4.4	Forecast evaluation .....	61
4.5	Discussion .....	65
4.6	Conclusion .....	67
4.7	Appendix.....	68
<b>5</b>	<b>Conclusion.....</b>	<b>69</b>
<b>6</b>	<b>References .....</b>	<b>72</b>
<b>7</b>	<b>Appendix .....</b>	<b>90</b>
<b>A1</b>	<b>Short summary of studies .....</b>	<b>91</b>
<b>A2</b>	<b>Kurzzusammenfassung.....</b>	<b>96</b>
<b>A3</b>	<b>Statement of personal contribution .....</b>	<b>103</b>
<b>A4</b>	<b>List of publications.....</b>	<b>106</b>