# ‘THE LITTLE CONVERGENCE’

## A COMPARATIVE ANALYSIS OF FINANCIAL EFFICIENCY AND ECONOMIC SOPHISTICATION THROUGHOUT EUROPE BETWEEN 1450 AND 1800


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June 2014

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# ACKNOWLEDGEMENTS

This Master's thesis is the outcome of a process of individual reading, data collection and writing that eventually took more than six months. But also in historical science, studies come into being thanks to discussion and reflection. For that, I feel obligated to a group of people that, during the previous months, proved to be very inspiring and helpful. During one of the Master's lectures, dr. Jeffrey Fynn-Paul triggered me to obtain a fuller understanding of the concept of the Little Divergence. Discussions on this phenomenon and the possible role of public debt mechanisms in pre-modern processes of economic growth, encouraged me to jump into medieval and early modern credit markets. I want to thank him for his supervision and advice. Although there were certainly some moments that I stranded and seriously considered giving up or taking another route, he kept continuous confidence in me and my project. Moreover, I want to thank prof. dr. David Stasavage for providing me with the data that he collected for his own research and for his explanation on how he dealt with certain methodological issues, dr. Thomas Lindblad for the helpful discussions and his advice during my data collection and statistical calculations, and prof. dr. Manon van der Heijden for getting me into contact with several influential historians and providing me with literature that was difficult to obtain. I owe even more to my family and girlfriend, who have not only supported me during the previous six months but during my entire study. I want to thank them for being so helpful and patient and for helping me to take my mind off in order to obtain plenty of power to get back into my research. Last but certainly not least, I want to thank my colleague and friend Olivier van Paasschen, who inspired me during this research, with whom I compiled an extensive dataset on public interest rates, with whom I built several towers of secondary literature in the university libraries of Utrecht as well as Leiden, with whom I suffered several difficulties and, most importantly, with whom I established a very close friendship during this project.

What started with an ambitious plan to collect new quantitative data on European interest rates, resulted into a paper with a daring and surprising thesis which, I hope, will shed new light on the concept of the Little Divergence and the debate on economic growth in early modern Europe. Because this paper contributes to a recent debate on which relatively few historians have written and because I followed a path that have not been followed by many, the research that laid the foundations for this paper was an inspiring, stimulating though enervating process that, nevertheless, enabled me to prove myself as a fully-fledged historian. Although it was not always an easy path, the help of these people enabled me to complete this work successfully.

Rob van Erp
10 June 2014

# INTRODUCTION

## Understanding the miracle of economics

What exactly made Britain differ from the rest of Europe and made it experience its 'Industrial Revolution'? Or was it not just Britain that experienced a divergence from the rest of the continent? These and similar questions have bothered economic historians for decades, indeed, even centuries. In order to trace the different trajectories of European economies through history, historians have unleashed different theoretical approaches on economic performance that specifically focus on the quality of institutional frameworks: the so-called 'institutionalisms' and 'new institutionalisms'. Also contemporary economists and development organizations like the International Monetary Fund and the World Bank have discovered the importance of institutions for economic growth, since they encompass institutional issues like corruption and rule-of-law into their policy recommendations.[1] This paper addresses one of the most influential schools within the institutional approach on economic performance. The ideas of this school, led by the works of Douglass North, are based on the assumption that the emergence of efficient institutions reduce the fundamental uncertainty of market exchange.[2] Moreover, they suggest that a country's institutional framework is hierarchically structured since political institutions have a direct bearing on economic institutions which, in turn, influence economic performance. Hence, if efficient institutions and the right rules have been developed, they believe, the reduction of transaction costs will eventually result in higher levels of market exchange, production, specialization and, ultimately, economic growth. Following this causality, their contributions make an effort to grasp the efficiency of political and economic institutions by analysing the supposed effects on the operation of economic markets. Douglass North and Barry Weingast, in their famous article 'Constitutions and Commitment: Evolution of Institutions Governing Public Choice in Seventeenth-Century England', followed this line of thought and argued that the acceleration of the English economy, on the eve of the Industrial Revolution, was in principal caused by political changes after the Civil War and Glorious Revolution in the seventeenth century. Indeed, in financial accounts they found evidence that the establishment of governmental checks had effect on the efficiency of the English financial markets. Hence, they argued that parliamentary activity allowed the sovereign to credibly commit to repayments of debts and ensured the protection of property rights in a way that Britian had never experienced before.[3] They believed that this new level of efficiency enabled the British economy to distinguish itself from the rest of the continent.

## Wages, wages and the *'Little Divergence'*

Recently, however, historians found quantitative evidence that the extraordinary performances of the British economy did not start in the seventeenth century but have to be traced back to the Middle Ages. In addition, they argued that this economic peculiarity did not just concern the British Isles. They

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[1] B. Carruthers, 'Rules, institutions, and North's institutionalism: state and market in early modern England', *European Management Review* 4 (2007) 40.

[2] D.C North, *Structure and Change in Economic History* (New York 1981); D.C North, *Institutions, Institutional Change and Economic Performance* (Cambridge 1990); D.C. North, *Understanding the Process of Economic Change* (Princeton 2005).

[3] D.C. North and B.R. Weingast, 'Constitutions and commitment: evolution of institutions governing public choice in seventeenth-century England', *Journal of Economic History* 49 (1989) 803-832.

believed that early modern Europe experienced a so-called 'Little Divergence', a term that refers to a large inter-European gap in wage levels which arose between northwest Europe (primarily the Netherlands and England) and the rest of Europe during the early modern period (approximately from 1450 through 1800). Those who have described the Little Divergence assume that it is a measure of the sophistication of the Dutch and English economies, relative to the rest of Europe.[4] While focussing on institutional efficiency, historians have posed different sorts of possible explanatory factors for this Little Divergence. In their article 'The Rise of Europe: Atlantic Trade, Institutional Change and Economic Growth', Daron Acemoglu, Simon Johnson and James Robinson argued that a combination of large profits from the Atlantic trade and pre-existing political institutions increased the influence of mercantile interests and thus provided northwest Europe with a significant check on the sovereign.[5] These merchants, in turn, moved their countries towards political reforms which eventually paved the way for further innovations in economic institutions.[6]

From the historiography on the Little Divergence can be concluded that various historians have accepted its existence as a well-established fact. This paper, however, addresses the possibility that this phenomenon was not as straightforward and profound as the theory suggests. In the following, it is argued that the works that have described the Little Divergence, have until now suffered from an over-reliance on the quantitative evidence of real wage estimates. For this reason, it is suggested that other indicators, where available, should be brought to bear. Hence, moving beyond the traditional reliance on real wages, this paper researches the question if the use of additional evidence shows that the Little Divergence was not as cut-and-dried as current theory holds. In other words, it explores the possibility that northwest Europe and the rest of the continent actually show evidence of economic convergence, rather than divergence. This paper reaches a profound answer by introducing new quantitative evidence on the relatively well-known measure of the interest rate. One of the alternative ways in which economic historians have tried to measure economic sophistication is the supposed 'efficiency' of financial institutions. It aims to prove that interest rates on public debt, as a measure for financial efficiency, are useful to quantify the quality of economic frameworks as integrated wholes. The quantitative evidence, which this paper will be working with, derives from the mechanism of public debt which in some form became ubiquitous throughout Europe during the early modern period.

## Method, approach and sources

In order to make an extensive analysis feasible, a dataset has been constructed that traces the history of public debt systems through three different data streams. These account for (1) differences that existed between and within the various instruments of public borrowing, (2) the exact date that public debt instruments emerged throughout Europe and (3) the rates of interest that governments had to pay in order to obtain access to public credit. The dataset compiles data from different secondary sources which, in turn, discuss various mechanisms of public credit within different European states and over various time spans. The knowledge from these studies, brought together in one analysis, will provide new insights into the economic efficiency of early modern Europe.

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[4] Among them are R.C. Allen, *The British Industrial Revolution in Global Perspective* (Cambridge 2009) and J.L. van Zanden, *The Long Road to the Industrial Revolution. The European Economy in a Global Perspective 1000-1800* (Leiden 2009).

[5] D. Acemoglu, S. Johnson and J. Robinson, 'The Rise of Europe: Atlantic Trade, Institutional Change and Economic Growth', *American Economic Review* 95-3 (2005) 546–579.

[6] Acemoglu et al., 'The Rise of Europe' (2005) 546-547 and 572.

This paper attributes two common measures of financial efficiency, namely creditworthiness and market integration. Considering creditworthiness, several historians have argued that interest rates are to be perceived as the most reliable proxy for institutional efficiency and therefore the level of economic sophistication.[7] It is assumed that in states with lower interest rates, institutional frameworks have a greater ability to guarantee and foster trust and regularity. So interest rates reflect a degree of creditworthiness, the protection of property rights and the enhancement of societal trust. Under this assumption, one might expect to see the measure of interest rates diverge as well as wage rates between northwest Europe and the rest of the continent. In fact, findings indicate that while interest rates between different countries across Europe began at highly divergent levels, they markedly converged during the early modern period. Interest rates seem to show a clear contradiction with what the Little Divergence might at first suggest.

The second measure that will be discussed, market integration, also seems to move contrary to the predictions of the Little Divergence theory. While from the Little Divergence theory might be expected that different regions of Europe, such as Italy, had low levels of market integration during the early modern period, in fact interest rates appeared to be fairly similar. Besides, Europe saw a general convergence of interest rates during this period, which once more seems to point to a converging market for public debt shares. Since securities were in many places a principal form of monetary investment, this suggests that markets for financial investments in general were converging throughout Europe during the early modern period, once more in contradiction to the Little Divergence theory.

The interest rates which form the primary dataset of this paper are taken from 34 different European public debt systems, from the late medieval period through 1800. Recent work on public debt systems holds that there are two types of states which are relevant to the analysis of public debt: the so-called 'territorial state' and 'city-state'. David Stasavage has recently argued that not only would city-states develop public debt systems earlier, but in general, their interest rates were substantially lower, for a longer period.[8] The findings of this research suggest that, while Stasavage was right about the timing of public debt systems in the main, though with a few notable exceptions, in fact the interest rates on territorial and city-state debt were converging throughout the early modern period. So there seems to be a convergence of the efficiency of these two types of debt system which influenced the entire European continent and became very noticeable at the end of the eighteenth century.

## Accounting for the '*Little Convergence*'

In general, therefore, the findings of this research help us to call into question any easy notion raised by the Little Divergence theory, that the economy of northwest Europe was increasingly 'better' or 'more efficient' than that of much of the rest of Europe from the medieval period through the early modern period. The over-reliance on wages, that the Little Divergence theory has heretofore done, should be called into question, and other indicators should be provided in order to create a more nuanced picture of what was actually occurring. Additional evidence will show that the Little Divergence was not as pronounced as is currently believed. More specifically, although differences in government types

[7] North, *Structure and Change in Economic History* (1981) ; H. de Soto, *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywehere Else* (New York 2000); J. Reis, *Institutions and Economic Growth in the Atlantic Periphery: The Efficiency of the Portugese Machinery of Justice 1870-1910*, Paper at Conference Law and Economic Development Utrecht (2007). Available at http://www.iisg.nl/hpw/papers/law-reis.pdf (consulted on May 29th 2014).

[8] D. Stasavage, *States of Credit: Size, Power, and the Development of European Polities* (Princeton 2011).

increased and considerable levels of direct integration between very distant states across Europe have not been proven, findings suggest that countries throughout Europe from the seventeenth century onwards were learning how to create effective public debt systems of which interest rates suggest that they were not markedly different from those that are supposed to be the most sophisticated European economies (i.e. the Netherlands and England). This means that they were effectively adopting the most sophisticated financial models available to their own local situations. This resulted in a convergence of financial practices that helped to integrate the economies of Europe, at a time when the Little Divergence is supposed to have been separating them. This paper's general finding is that interest rates suggest that, in some ways, the early modern period experienced a 'Little Convergence' rather than a 'Little Divergence.' It will show that the common notion of northwest European countries being economically more successful than the rest of the continent needs considerable nuance.

**Plan of the research**

In the following, each of the four chapters will begin with a short introduction of what is going to be discussed. It introduces the general argument of the chapter. Chapter one places the ongoing debate on the phenomena of the Great and Little Divergences in scholarly perspective. Moreover, it accounts for both the theory and method of this research. Chapter two discusses the history of public debt mechanisms since the efficiency of markets for public debt shares is used as a proxy for economic sophistication. It also accounts for the three different data streams upon which this paper builds. Chapter three contains a quantitative analysis on the evolution of public debt mechanisms during the early modern period. It introduces the Little Convergence and discusses how different European regions performed economically, based on the two indicators of creditworthiness and market integration. The final chapter, chapter four, addresses the integration of European credit markets in greater detail. It argues that the Little Convergence and the overall decline of European interest rates were mainly caused by technical practices and instruments rather than political institutions, although the latter initially proved to be decisive in the emergence of public debt systems. This paper concludes by returning to the research's hypothesis, summarizing the paper's main argument and proposing recommendations for future research.

# CHAPTER 1. ECONOMIC HISTORY... A HISTORY OF DIVERGENCES

## 1.1 Introduction

This chapter introduces the debate on the 'Little Divergence.' This phenomenon is called the Little Divergence to distinguish it from the 'Great Divergence' which saw European standard of living as a whole rise above world levels. Historians that have described the Little Divergence presume that the Dutch and English economies were economically more sophisticated than the rest of the continent. This chapter will argue that, until now, the quantitative evidence on which the Little Divergence theory is based, suffers from an over-reliance on wage rates. For this reason, this chapter aims to show that interest rates on public debt, measuring the efficiency of public debt systems, are a useful measure for economic performance as well. To test the achievements of public debt markets, while focussing on the quantitative measure of the interest rate, two indicators for financial sophistication will be introduced, that of creditworthiness and market integration. The institutional approach to the problem, most prominently elaborated in the works of Douglass North, provides the theoretical framework for the further analysis. Employing this theory, the performances of credit markets will then be connected to the issue of economic performance.

## 1.2 Modern economic growth and the '*Great Divergence*'

Nowadays, more than half the world's population expects their incomes to rise annually. Most world economies experience a process that Simon Kuznets has called 'modern economic growth.'[9] Kuznets introduced this term for a process of sustained increase in per capita income, combined with a long-term rise in capacity and diversion of the economic good-supply, as well as necessary social, institutional and technological changes. For much of history, however, the standard of living was poor and subject to little improvement. For most people, incomes were very low. Life was pitiful, short and vicious. Late-eighteenth-century Britain was the first economy to experience a radical break with this past. The 'Industrial Revolution' demarcated a world in which incomes were very low. During the nineteenth century, after an initial take-off in Britain, industrialization and interrelated changes in the agricultural and service sectors spread to the European continent, North America and Japan. After World War II, the 'Asian Tigers' followed and eventually, in the final decades of the twentieth century, the rest of Asia began to catch up. Why this radical breakthrough of pre-modern growth constraints did occur in Britain is probably the most important and exciting question that economic historians try to answer. Was it caused by the European imperial expansions? Was the agricultural sector the actual engine? Was a sudden increase in innovation responsible? Or, as this paper touches upon more directly, did peculiar British institutions such as financial mechanisms and more secure property rights enable the Industrial Revolution to occur?

During the 1950s and 1960s, research focused on Britain and the technological, economic and institutional transformations that had taken place just before the Industrial Revolution.[10] Historians compared Britain with other European countries, mainly France and the Netherlands, searching for differing characteristics and potential explanations. Three decades later, in the 1980s and 1990s, the debate

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[9] S. Kuznets, *Modern Economic Growth: Rate, Structure and Spread* (New Haven 1966).

[10] P. Deane and W.A. Cole, *British Economic Growth 1688–1959. Trends and Structures* (Cambridge 1962); P. Deane, *The First Industrial Revolution* (Cambridge 1965).

expanded into a discussion on the dynamic of the early modern European economy. Representatives of the so-called 'Revolt of the Early Modernists' demonstrated that the Industrial Revolution was not a sudden breaking event that emerged in eighteenth-century Britain. They argued that western Europe and the countries bordering the North Sea in particular, were already more dynamic, competitive and creative than the rest of the world in the centuries before 1800. Their argument supported on evidence from proto-industrialization, improvements in agriculture, levels of urbanization, the development of long-distance trade and finance, and changes in consumption patterns that convinced households to expand their labour output - a process that Jan de Vries called the 'Industrious Revolution.'[11] They suggested that a slow economic progress during the early modern period put England in a leading position and finally resulted in the Industrial Revolution. It implied a long-term diverging process between the economies of western Europe and the rest of the world, the so-called 'Great Divergence,' before the former would eventually emerge as the most wealthy and powerful of world civilizations. Several influential historians, including Eric Jones, Angus Maddison and David Landes, subscribed to this view.[12]

Though, this interpretation has been questioned by several notable world historians, including Roy Bin Wong, Bozhong Li, Prasannan Parthasarathi and Kenneth Pomeranz.[13] These representatives of the California school, since most of them worked in California, claimed that the Great Divergence between Europe, China and possibly also other parts of Asia occurred only after 1800. Before this date, according to Pomeranz, the most advanced parts of Europe and Asia were on the same development trajectory with "multiples cores and shared constraints."[14] He argued that regions had very similar levels of both income and productivity and shared crucial economical features. Hence, from his point of view, the decisive economic acceleration of Europe after 1800 could not be the consequence of fundamental differences in growth potential, markets or institutions in preceding centuries.[15] Recent evidence has mounted that the authors of the California School have massively exaggerated the development level of the most advanced Asian economies in 1800 though, so that their most striking arguments turn out to be false.[16] Quantitative research, relying on long-term income estimates, has suggested that the Great Divergence existed well before 1800. Reconstructions of real wages across early modern Europe and Asia by Robert Allen et. al. suggest that incomes in northwest Europe were already much higher than in the Yangzi Delta by the 1730s

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[11] S.C. Ogilvie, 'Proto-Industrialization in Europe'*, Continuity and Change* 8-2 (1993) 159-179; J.L. van Zanden, 'The development of agricultural productivity in Europe, 1500-1800', in: B.J.P. van Bavel and E. Thoen (eds.), *Land productivity and agro-systems in the North Sea area, Middle Ages - 20th century: Elements for comparison* (Turnhout 1999) 357-375; J. de Vries, *European Urbanization, 1500-1800* (Cambridge 1984); J. de Vries, 'The Industrial Revolution and the Industrious Revolution', *Journal of Economic History* 54-2 (1994) 249-270; J. de Vries, *The Industrious Revolution: Consumer Behavior and the Household Economy, 1650 to the present* (New York 2008); Van Zanden, *The Long Road to the Industrial Revolution* (2009) 3-5.

[12] E. Jones, *The European Miracle: Environments, Economies and Geopolitics in the History of Europe and Asia* (Cambridge 1987); A. Maddison, *The World Economy: a Millennial Perspective* (Paris 2001); D. Landes, *The Wealth and Poverty of Nations* (New York 1998).

[13] R. B. Wong, *China Transformed: Historical Change and the Limits of European Experience* (London 1997); B. Li, *Agricultural Development in Jiangnan 1620-1850* (New York 1998); P. Parthasarathi, 'Rethinking Wages and Competitiveness in the Eighteenth Century: Britain and South India', *Past and Present* 158 (1998) 79-109; P. Parthasarathi, *The Transition to A Colonial Economy: Weavers, Merchants and Kings in South India, 1720-1800* (Cambridge 2001); K. Pomeranz, *The Great Divergence. China, Europe and the Making of the Modern World Economy* (Princeton 2000).

[14] Pomeranz, *The Great Divergence* (2000) 107.

[15] *Ibidem,* 3-4.

[16] S. Broadberry, 'Accounting for the Great Divergence', *Economic History Working Papers* 184-13 (2013) 2-3.

(considered by Pomeranz, among others, as the most advanced parts of Eurasia).[17] Due to this quantitative research, it is now widely accepted that the Great Divergence had its origins in the late medieval period and was already well under way during the early modern period. While Europe accumulated capital and improved its institutions through time, Asia stagnated and began to fall behind. Processes of colonial expansionism, imperialism and the Industrial Revolution are widely considered as accelerating factors for this diverging process but definitely not as its fundamental causes.[18] Nevertheless, although the most striking claims of the California School have been proven wrong, its contribution has had an enduring effect on the Great Divergence debate. It pointed out to economic historians that regional differences did not only exist *between* different continents, but were also present *within* both continents. A decade ago, the literature on economic history did not take these regional differences into very explicit account. Nowadays, however, it is unthinkable that an historical comparison between the European and Asian economies ignores regional variations within both continents.

### 1.3 Measuring and explaining the '*Little Divergence*'

The last decade has seen tremendous progress in the extension of detailed quantitative research into the various trajectories of European countries. Since the 1980s and 1990s, economic historians already pointed to several processes to prove the dynamic of the early modern European economy. However, these contributions were largely qualitative. Recently, quantitative research into the long-term development of the European economies, focussing on living standards and based on hard data, provided evidence for the existence of an inter-European divergence in incomes between 1450 and 1800. The emphasis on this type of research started in 2001 with Angus Maddison's collection of GDP per capita estimates for a range of European countries.[19] Nevertheless, his dataset contained a large share of guessing and missing figures. That same year, Robert Allen developed a method to estimate real wages of skilled and unskilled craftsmen for different cities across Europe.[20] He demonstrated that in the centuries before 1800 a substantial income gap emerged as wages collapsed in most European cities - as earlier suggested by Wilhelm Abel and Jan Luiten van Zanden - while they remained at an equilibrium level in northwest Europe (the Netherlands and England).[21] According to his wage estimates, countries in the northwest region "had somewhat higher real wages than the rest of Europe in the fifteenth century, but the differential was comparatively small. In the next three centuries, real wages declined by half on the continent, while remaining roughly constant in [the Netherlands and England]."[22] The result of these

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[17] R.C. Allen et al., 'Wages, prices and living standards in China: in comparison with Europe, Japan and India', *Economic History Review* 64-1 (2011) 8-38; Results of measured prices, wages and economic wellbeing around the world by several scholars has been collected and is available at http://gpih.ucdavis.edu/ (consulted on April 3th 2014).
[18] Broadberry, 'Accounting for the Great Divergence' (2013) 2-3.
[19] Maddison, *The World Economy* (2001); A. Maddison, 'Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD', *Groningen Growth and Development Centre* (2010); access via http://www.ggdc.net/MADDISON/oriindex.htm (consulted on May 25th 2014).
[20] R.C. Allen, 'The Great Divergence in European Wages and Prices from the Middle Ages to the First World War', *Explorations in Economic History* 38 (2001) 411-447.
[21] W. Abel, *Agricultural Fluctuations in Europe from the Thirteenth to the Twentieth Centuries* (London 1980) 292-293; J.L. van Zanden, 'Wages and the Standard of Living in Europe, 1500–1800,' *European Review of Economic History* 3 (1999), 175-197.
[22] Allen, 'The Great Divergence' (2001) 413.

various trajectories was the so-called 'Little Divergence': the presence of a large wage gap between the northwest and the rest of Europe (figure 1).[23]

This evidence for a Little Divergence is enormously relevant for the debate on the Great Divergence since the existence of regional diversity, as the California School has suggested, could imply that not Europe as a whole but rather a region within Europe diverged from the rest of world economies. It also has implications for understanding the Industrial Revolution. The Little Divergence theory suggests that Britain's industrialization should be perceived as a continuation of trends that can be dated back to the late medieval period rather than presenting it as a first radical break with Europe's Malthusian past.[24] In conclusion, quantitative work on European wages has aimed to prove a considerable difference between northwest Europe and the rest of the continent. Allen's evidence on wage rates has often been used to assume that the economies of the Netherlands and England were increasingly 'better' or 'more efficient' than that of much of Europe during the early modern period.[25] A convergence of incomes, according to the Little Divergence theorists, awaited significant improvements and would only occur in the nineteenth or really in the twentieth century, indeed, only in the post-World War II boom.[26]

The phenomenon of the Little Divergence has excited economic historians and stirred them to search for other evidence for economic differences between northwest Europe and the rest of the continent. De Vries found differences in levels of urbanisation, Buringh and Van Zanden found varieties in the consumption and production of books and therefore distribution of knowledge, Allen pointed to differing levels of agricultural productivity, and Van Zanden, Buringh and Bosker emphasized the importance of an institutional divergence, or better to say a divergence in representative activity.[27] Building upon these insights, economic historians have also begun to produce more profound estimates of GDP per capita for different European countries. In the case of England and the Netherlands, abundant quantitative information has survived in the well-documented archives. This enables historians to construct the English and Dutch national trajectories in great detail.[28] For Italy and Spain, on which information is more limited or where existing data have not been analysed or processed as much, historians developed an alternative method to reconstruct GDP per capita.[29] Advocates of the Little

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[23] Allen, 'The Great Divergence' (2001) 429; see figures 7 and 8.

[24] This vision has been emphasized in: Van Zanden, *The Long Road to the Industrial Revolution* (2009) 95; A. de Pleijt and J.L. van Zanden, 'Accounting for the 'Little Divergence': What drove economic growth in pre-industrial Europe, 1300-1800?', *CGEH Working Papers* (2012) 1; R.C. Allen, *The British Industrial Revolution in Global Perspective* (Cambridge 2009).

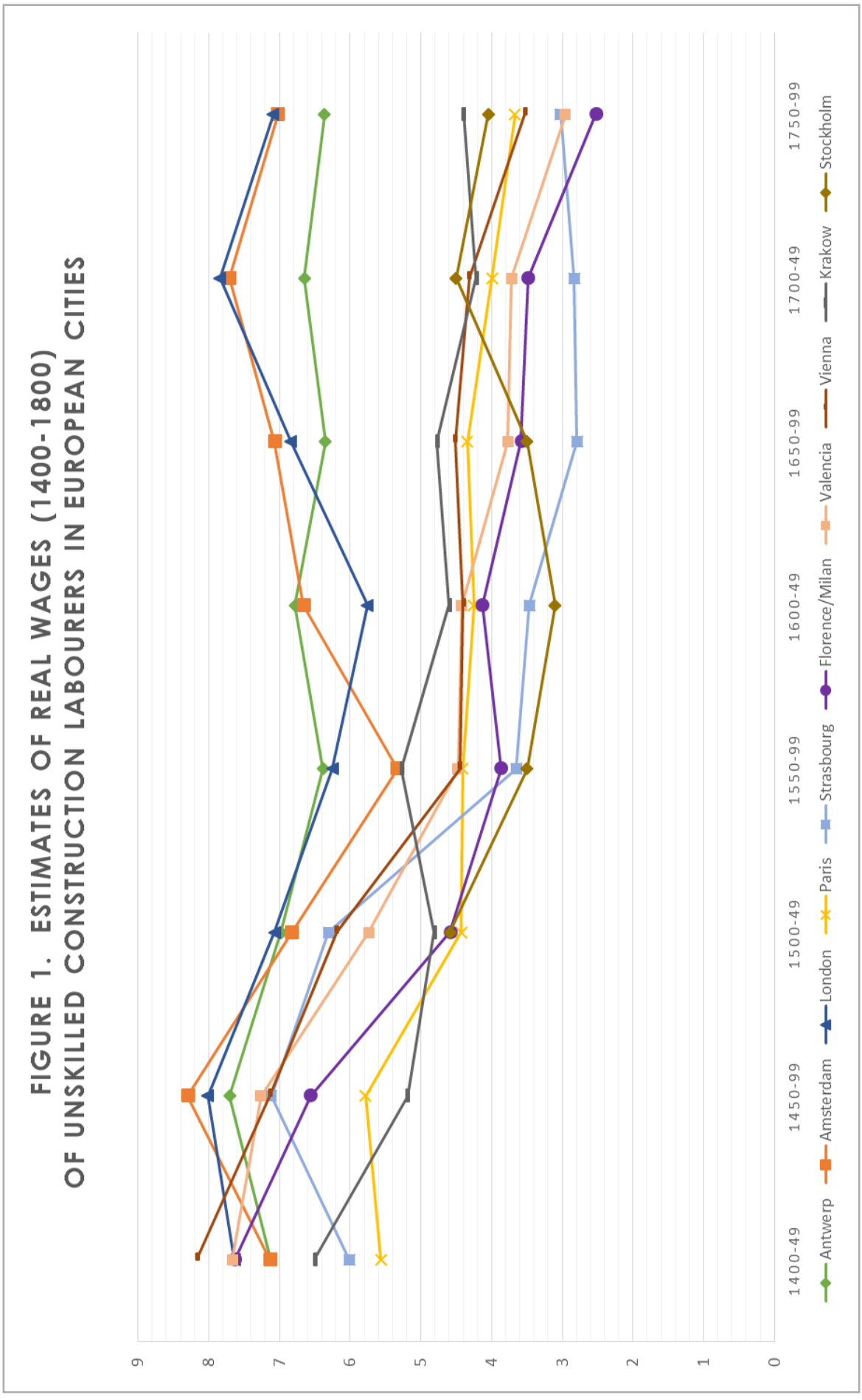
[25] *Ibidem.*

[26] Allen, 'The Great Divergence' (2001) 435.

[27] De Vries, *European Urbanization* (1984); E. Buringh and J.L. van Zanden, 'Charting the 'Rise of the West': manuscripts and printed books in Europe, a long-term perspective from the sixth through eighteenth centuries', *Journal of Economic History* 69 (2009) 409-445; R.C. Allen, 'Economic structure and agricultural productivity in Europe, 1300-1800', *European Review of Economic History* 3 (2000) 1-25; J.L. van Zanden, E. Buringh, and M. Bosker, 'The Rise and Decline of European parliaments, 1188-1789', *Economic History Review* 65-3 (2012) 835-861.

[28] S. Broadberry et al., 'English Economic Growth 1270-1700', *CAGE Online Working Paper Series* (2010) 1-63; J.L. van Zanden and B. van Leeuwen, 'Persistent but not Consistent: The Growth of National Income in Holland, 1347-1807', *Explorations in Economic History* 49 (2012) 119-130.

[29] P. Malanima, 'The Long Decline of a Leading Economy: GDP in Central and Northern Italy, 1300-1913', *European Review of Economic History* 15 (2011) 169-219; C. Álvarez-Nogal and L. Prados de la Escosura, 'The Rise and Fall of Spain, 1270-1850', *CEPR discussion papers* 8369 (2012); For a well-written discussion on this method see: Broadberry, 'Accounting for the Great Divergence' (2013) 5-6.




*Sources*: Allen, 'The Great Divergence' (2001); Van Zanden, *The Long Road to the Industrial Revolution* (2009) 97; http://gpih.ucdavis.edu/ (consulted on April 3th 2014).

Divergence theory have suggested that the emerging pattern is also one of diverging trajectories.[30] Nevertheless, GDP per capita show a rather different picture than Allen's wage rates have provided. Most important, a clear divergence is considerably less obvious.[31] Indeed, the exact occurrence of this divergence is dependent on which specific country is under examination. The Dutch already had a much higher income than the rest of the continent during the sixteenth century, but Britain distances itself from the other countries only by the eighteenth century. Nevertheless, GDP per capita estimates do suggest that continuous growth during the early modern period was concentrated in the Low Countries and British Isles. In the other parts of the European continent income went slightly down or stagnated at best. In short, recent research has aimed to show that within early modern Europe a massive reversal of fortunes between the North Sea Area and Mediterranean Area took place.

The area of measurement is where most advancement has been made, but there have also been very recent improvements in understanding explanatory factors leading to the Little Divergence. Although scholars have controlled for several determinants of economic growth (for instance factor endowments and human capital formation), historians and economists most notably rely on various 'institutionalisms' and 'new institutionalisms' in order to explain economic growth, stressing the importance of institutions for economic performance. More will be said on this institutionalism at a later stage, here it is sufficient to mention that historians have offered explanations for the Little Divergence based upon the peculiarity and performances of many different kinds of institutions. A first group of historians has stressed the role of demographic institutions. John Hajnal argued that northwest Europe had a distinguishable demographic pattern from the rest of the European continent.[32] This insight stirred Tine de Moor and Jan Luiten van Zanden to develop a micro-economical explanation for the Little Divergence. They argued that a co-evolution existed between this demographic regime and the fact that northwest households were well-adapted to a new commercialized environment. Due to the particular marriage pattern, they participated to a different extent in labour and capital markets.[33]

A second group of historians has drawn attention to economic and political institutions and examined how they affected the operation of market economies. In order to explain the Little Divergence, they have connected this form of institutionalism with the occurrence and growth of long-distance and transatlantic trade. The new trading routes to Asia, carrying European sailing ships around the south of Africa, and to the New World, crossing the Atlantic and guiding cargo to newly established American ports, provided the Dutch and later the English with an enormous new incentive for economic activities. Daron Acemoglu, Simon Johnson and James Robinson argued that Atlantic trade and the associated colonialism set off the rise of northwest Europe, not only directly but more importantly indirectly by inducing institutional change.[34] After 1500, when profits from long-distance trade began to increase, northwest European countries distinguished themselves from the rest of the continent, because pre-existing political institutions provided significant restrains on the monarchic executive powers which

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[30] De Pleijt, 'Accounting for the 'Little Divergence' (2012) 4.
[31] *Ibidem,* 1 and 4: See figure 1.
[32] J. Hajnal, 'European marriage patterns in perspective', in D. Glass and D. Eversley (eds.), *Population in History: Essays in Historical Demography* (Chicago 1965) 101-143.
[33] T. de Moor and J.L. van Zanden, 'Girl Power: the European marriage pattern and labour markets in the North Sea region in the late medieval and early modern period', *Economic History Review* 63-1 (2010) 1 and 27-29; J.L. van Zanden and T. de Moor, 'Girl Power. The European Marriage Pattern and Labour Markets in the North Sea Region in the Late Medieval Period', in: Van Zanden, *The Long Road to the Industrial Revolution* (2009) 12, 138-141.
[34] Acemoglu et al., 'The Rise of Europe' (2005) 546–579.

withheld rulers to appropriate the bulk of gains from trade for their own benefit, while the growth and large profits from Atlantic trade strengthened the mercantile groups and their interests. Hence, the balance of political power swung away from the monarchy towards merchants, who obtained significant reforms in political institutions. These, in turn, introduced more secure protect property rights and eventually stimulated further innovations in economic institutions.[35] In both Spain and Portugal, two countries that were also pioneers in long-distance trade and had Atlantic coasts, such checks were absent what made that rulers remained to be strong enough to take advantage of revenues from trade themselves. They proved to be capable to prevent the merchant class from becoming too influential in constraining this exploitation.[36] These arguments, referring to long-distance trade, can in turn be linked with the scholarly attention on the exceptional attitude to work in northwest Europe. Although the idea of such a distinctiveness can be traced back to Max Weber's perception on the protestant work ethic, the most recent and influential version is De Vries' concept of the Industrious Revolution.[37] De Vries argued that a large number of new, unknown and attractive goods became available by long-distance trade and industrial innovations. To purchase these goods, especially Dutch and English people proved to be willing to work more hours.[38] The rising demand for products can be perceived as a necessary demand-side condition for industrial and trading activities.[39]

### 1.4 Theory: Douglass North and institutional efficiency

Most economists and economic historians have agreed that institutions are most important for the functioning of economies and therefore have turned their attention onto the performance of institutions in order to explain economic growth.[40] Although there are a lot of different institutions, most of the recent practical and academic work has focused on countries' political and economic institutions and has tried to analyse how they affected the operation of market economies. This paper focusses on this particularly influential version of institutionalism from within the institutional literature. Led by the Nobel Prize-winning works of Douglass North, economists and economic historians developed a theoretical approach to analyse long-term economic performance, while focussing on the efficiency of institutions.[41] This 'new institutional economic' approach believes that the quality of the institutional framework has direct bearing on a country's economic performances since it organizes the interaction and cooperation between different actors in a country. North himself defined the basic problem as a problem of cooperation which allows people to capture the gains from trade.[42] He explored how institutions emerged to reduce the fundamental uncertainty of exchange. In a more sensible manner, North suggested that credibility manifests itself in the level of transaction costs. Institutions, both

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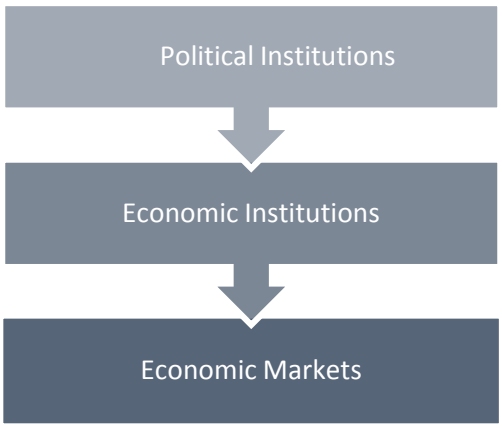
[35] Acemoglu et al., 'The Rise of Europe' (2005) 546-547 and 572.
[36] *Ibidem,* 546–579.
[37] M. Weber, *The Protestant Ethic and the Spirit of Capitalism* (London 1930); De Vries, *The Industrious Revolution* (2008).
[38] Hans-Joachim Voth has presented this argument by showing evidence for the predicted increase in work intensity. Although similar developments have been observed in Paris and other European cities, Britain and Holland were the core regions of this consumerism, H.J. Voth, 'The Longest Years: New Estimates of Labor Input in England, 1760-1830", *Journal of Economic History* 61 (2001) 1065-1082.
[39] Allen, *The British Industrial Revolution* (2009) 13.
[40] Carruthers, 'Rules, institutions, and North's institutionalism' (2007) 40.
[41] North, *Structure and Change in Economic History* (1981); North, *Institutions, Institutional Change and Economic Performance* (1990); North, *Understanding the Process of Economic Change* (2005).
[42] North, *Institutions, Institutional Change and Economic Performance* (1990).

informal (norms of behaviour) and formal (laws and rules) are a way to reduce this uncertainty. Hence, credibility is crucial to issues of economic growth, the integration of economies and the appearance of markets. If institutions are relatively efficient and the right rules have been developed, transaction costs will be reduced which eventually encourages economic growth through the stimulation of market exchange, production and specialization.

When societies become more complex, formal enforcement mechanisms become more important. The coercive power of the state is from vital importance within an integrated system of formal institutions. From North's point of view, the relationship between several institutions is a hierarchical one with each level setting limits on the level below: from political institutions at top level, via economic institutions down to economic markets at the lowest (figure 2).[43] In this context, it is argued that a strong representative institution serves as a commitment technology that reduces the fundamental uncertainty of exchange at the highest level. The following reduction of transaction costs, through economic institutions, would eventually also affect the efficiency and credibility of economic markets, enabling a process of economic growth. The most notable example on which this theory has been applied, is probably late-seventeenth-century Britain. Studies from North and Weingast as well as Acemoglu and Robinson have pointed to the Glorious Revolution of 1688 as a turning point between absolutism and the implementation of parliamentary checks on the executive monarchic powers.[44] North and Weingast argued that the establishment of a limited monarchy allowed the sovereign to credibly commit to both repayments of debts and the security of property rights in a way which was not previously possible. The Glorious Revolution established parliamentary ascendancy over financial businesses and institutions, such as the Bank of England. As a body with divergent interests and "increased control of wealth holders over government," parliament was less likely to distort the market.[45] Courts were important in limiting the monarch's ability to revoke on debt and in securing property rights. The checks on dictatorship conditioned a climate fit for the accumulation of capital.[46] Increased confidence in the state fuelled financial innovations which made a larger range of projects economically feasible.[47] In short, the new institutional approach expresses that political and legal changes created a favourable climate for investment and innovation that results in economic growth, in this case an Industrial Revolution.[48]

**FIGURE 2.**
**INSTITUTIONS AND ECONOMIES**




[43] North, *Institutions, Institutional Change and Economic Performance* (1990) 52.
[44] North and Weingast, 'Constitutions and commitment' (1989) 803-832; D. Acemoglu and S. Johnson, *Why nations fail: The origins of power, prosperity and poverty* (New York 2012).
[45] North and Weingast, 'Constitutions and commitment' (1989) 817 and 818-820.
[46] C.J. Zuiderduijn, *Medieval Capital Markets, Markets for Renten between State Formation and Private Investment in Holland (1300-1550)*, dissertation (Leiden 2007) 190.
[47] North and Weingast, 'Constitutions and commitment' (1989) 825.
[48] Allen, *The British Industrial Revolution* (2009) 5; J.B. de Long and A. Schleifer, 'Princes and Merchants: European City Growth before the Industrial Revolution, *Journal of Law and Economics* 16 (1993) 671-702; Acemoglu et al., 'The Rise of Europe' (2005) 546–579; A. Greif, *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade* (Cambridge 2006).

The example of Acemoglu, Johnson and Robinson's explanation for the Little Divergence has suggested that a profound examination of institutional efficiency, reasoning from the institutional standpoint, also enables a fuller understanding of possible explanatory factors behind the Little Divergence.[49] It must be mentioned, however, that it is difficult to trace the efficiency of institutions and their exact effects on market performance. A lot of previous work in this field, for instance, has focused on the presumed efficiency of very specific institutions such as merchant and craft guilds.[50] A specific approach on individual institutions implies some serious problems for a sound examination of institutional efficiency. Firstly, Van Zanden has pointed to the problem that all such particular institutions are embedded in a specific social, political and cultural context and therefore are interdependent and interconnected.[51] Secondly, Oscar Gelderblom and Regina Grafe have emphasized the difficulty of measuring the influence that one particular institution has on transaction costs. Gelderblom and Grafe argued that one institution often solves more than one particular problem due to its interrelatedness in a complex network of institutions. An institutional solution to one specific problem has therefore often also has consequences for other related problems.[52] Hence, it turns out that a lot of scholarly research, presumed to measure the efficiency of specific institutions, actually measured the success of a complex network of mutually connected institutions which made markets perform better or worse.[53] This causes serious methodological problems if institutional frameworks *within* countries are examined, but opens new opportunities for analyses of differences *between* countries' institutional qualities. Hence, taking this into account, institutional systems and markets should be examined as integrated wholes. Following this line of thought, constructing a measure for the efficiency of wholly integrated institutional systems is a profound manner to measure the institutional performances of early modern European states.[54] However, the quantity of systematic historical research on the quality of European institutions as integrated entities is surprisingly small.[55]

### 1.5 Method: public debt systems and economic sophistication

Although the institutional approach on economic growth has delivered several explanatory factors, the quantitative evidence on which the Little Divergence theory has heretofore relied, consists for the greater part of evidence from real wages and indicators that do not directly address the efficiency or sophistication of institutions. Moreover, estimates of GDP per capita have not shown an obvious inter-European divergence from 1450 through 1800, with such a conspicuousness as wage rates did. Therefore, it is not incorrect to suggest that the idea of the Little Divergence suffers from an over-reliance on Allen's real wage measure. Hence, other indicators, where available, should be introduced in the historical debate, in order to create a more profound picture of what was occurring during the time of the so-called Little Divergence. For this reason, this paper introduces another quantitative measure to analyse economic performance: the interest rate.

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[49] Acemoglu et al., 'The Rise of Europe' (2005).
[50] Van Zanden, *The Long Road to the Industrial Revolution* (2009) 17.
[51] *Ibidem,* 17-18.
[52] O. Gelderblom and R. Grafe, How to Beat (Very) Imperfect Markets? Re-thinking the Comparative Study of Commercial Institutions in Pre-modern Europe (2007), access via http://old.hss.caltech.edu/~jlr/events/ Very%20 Imperfect%20Markets.pdf (consulted on May 5th 2014).
[53] Van Zanden, *The Long Road to the Industrial Revolution* (2009) 18.
[54] *Ibidem;* this approach is suggested by Van Zanden.
[55] *Ibidem*.

This section aims to prove that interest rates on public debt are a useful measure of economic efficiency and performance. North himself has put forward the testable hypothesis that the interest rate provides "the most evident quantitative dimension of the efficiency of the institutional framework."[56] Beside North, Hernando de Soto and Jaime Reis have also clearly argued that the rate of interest is the most reliable quantitative measure for institutional success.[57] Moreover, several historians have attributed the interest rate to quantify the efficiency of institutions, including Gregory Clark, Jaco Zuiderduijn and Jan Luiten van Zanden.[58] The dependence on interest rates implies that a further analysis of economic performance, applying a measure for institutional efficiency, leads us in the direction of financial institutions or, more particularly, the direction of capital markets. Theoretically, the interest rate accounts for the degree of trust that lending parties have in the full or partial repayment of a borrowed sum of money. Following the institutionalists' line of thought and the hierarchical relationship between institutions, this indicator for market performance reflects the quality of the economic and political institutions that gave these markets the occasion to reach such a level of efficiency. In other words, interest rate issued on different types of debt shares reflect the ability of economic and political institutions to influence borrowers' creditworthiness through, for instance, the instrument of property rights.[59] To avoid aforementioned problems, i.e. the problem of examining specific institutions, the quantitative measure of institutional efficiency that is used here will encompass each institutional framework as a whole. Combining the notion that interest rates are probably the best way to measure the success of an institution and that institutional frameworks should be examined as wholly integrated systems, interest rates on public debt, issued by state governments, therefore can be perceived as one of the most reliable proxies for institutional efficiency, the protection of property rights and enhancement of trust and credibility in societies as integrated wholes. Chapter two concerns an accurate discussion on the applied method of compiling and analysing an extensive database on public interest rates.

Another causal relationship between the efficiency of public debt markets and better economic performance stems from the idea that investing in public debt shares activates the wealth and savings of the public. In this context, such an initial mobilization proves to be of enormous importance since the mass mobilization of savings is understood as one of the prerequisites for modern economic growth.[60] Although public debt mechanisms remained a relatively restricted form of the activation of savings and therefore did not create as much economic growth as modern banking systems (which tend to channel capital more directly toward private enterprise), it can be argued that the idea for private company shares

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[56] North, *Institutions, Institutional Change and Economic Performance* (1990) 69.

[57] North, *Structure and Change in Economic History* (1981); De Soto, *The Mystery of Capital* (2000); Reis, *Institutions and Economic Growth in the Atlantic Periphery* (2007).

[58] G. Clark, 'The Cost of Capital and Medieval Agricultural Technique', *Explorations in Economic History* 25 (1988) 265-294; G. Clark, *A Farewell to Alms. A brief economic history of the World* (Princeton 2007) 167-172; S.R. Epstein, *Freedom and Growth. The Rise of States and Markets in Europe 1300-1750* (London and New York 2000); Zuiderduijn, *Medieval Capital Markets* (2007); Van Zanden, *The Long Road to the Industrial Revolution* (2009); Stasavage, *States of Credit* (2011).

[59] North, *Institutions, Institutional Change and Economic Performance* (1990) 3-16.

[60] J. Fynn-Paul, 'The Land Commenda in the Late Medieval Crown of Aragon: The Rise and Decline of a Democratic Investment Culture' (under submission) 3; O. Galor and O. Moav, 'From physical to human capital accumulation: Inequality and the process of development', *Review of Economic Studies* 71 (2004) 1021; N. Voigtländer and H.J. Voth, 'Why England? Demographic factors, structural change and physical capital accumulation during the Industrial Revolution', *Journal of Economic Growth* 11-4 (2006) 3 and 30.

originated in the sphere of public finance and that experiments with public debt shares foretokened developments towards a truly mass mobilization of public savings.[61] Jeffrey Fynn-Paul argued that "the 'normal' progression of the mobilization of savings in western Europe was for states to first [implement a successful public debt system], which resulted in a partial mobilization of the savings of a wealthy few, followed (often much later) by the implementation of a universal banking system, which finally led to the truly mass mobilization of savings which is today taken for granted in advanced societies."[62]

In short, one of the ways in which economic historians have measured the sophistication of economies is the supposed 'efficiency' of its financial institutions. Coming back to the issue of measuring the efficiency of these institutions, in this respect the public debt market, "most economists and economic historians would agree that efficient market structures are both evidence of economic sophistication and prosperity as well as prerequisites for further economic growth."[63] Hence, this paper presents two indicators that shed light on market performance and institutional efficiency in several European states and regions. The first one considers the extent to which an institutional framework reflects creditworthiness, guarantees property rights and promotes trust. Participants on the capital market must have a lot of confidence in debtors, who they entrust with their savings on the promise of paying regular interest. Hence, the emergence of a relatively risky transaction serves as a qualitative approach to the issue of market performance which makes just the creation of a debt or loan an excellent first indicator of creditworthiness.[64] David Stasavage has already done a sizeable amount of work on this, which this paper will complement with new material.[65] Besides, the rate of interest itself, paid on the capital market for the obtainment of large sums of money, is a direct measure for the level of trust that the lender places in the borrowing party. In applying this method, this paper builds upon the works of North and Weingast as well as Stephan Epstein, David Stasavage and Bruce Carruthers who used evidence on public interest rates as an indicator for economic sophistication.[66]

The second indicator for financial and economic efficiency that this paper addresses, measures the extent of market integration in an economy. More specifically, it measures the integration of monetary markets and financial practices relating to public debt. For this measure, the same interest rates on governmental debt will be used. Firstly, market integration can be measured by observing the volatility of annual prices. A low volatility indicates that the market is able to eliminate the effects of economic shocks via trade. A high volatility indicates that trade cannot cushions such shocks. Normally, there is high variability in poorly advanced market systems with high transaction costs and low volumes of trade. As markets persist to integrate, the fluctuation of prices, reflected in a 'coefficient of variation,' decreases. A second measure for the integration of markets is the convergence of prices. If the data is very accurate and allows such an analysis, the extent of correlation between different trajectories indicates a degree of mutual dependence. Although most of these studies have examined markets for grain and rice, economic

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[61] J. Fynn-Paul, 'The Evolution of Eighteenth-Century Investment Capitalism from an Investor's Point of View: The Van der Muelen Family Portfolio, 1738-1814' (currently under review), 7; J. Fynn-Paul, 'The Land Commenda in Late Medieval Crown of Aragon: The Rise and Decline of a Democratic Investment Culture' (under submission) 4.
[62] Fynn-Paul, 'The Land Commenda in the Late Medieval Crown of Aragon' (under submission) 4.
[63] R. Studer, 'India and the Great Divergence: Assessing the Efficiency of Grain Markets in Eighteenth- and Nineteenth-Century India', *The Journal of Economic History* 68-2 (2008) 195.
[64] Zuiderduijn, *Medieval Capital Markets* (2007) 23 and 78.
[65] Stasavage, *States of Credit* (2011).
[66] North and Weingast, 'Constitutions and commitment' (1989); Epstein, *Freedom and Growth* (2000); D. Stasavage, 'Credible Commitment in Early Modern Europe: North and Weingast revisited', *Journal of Law, Economics and Organization* 18-1 (2002) 2-3; Carruthers, 'Rules, institutions, and North's institutionalism' (2007) 51-52.

historians have begun to attribute similar methods to measure the integration of financial markets.[67] Larry Neal, for instance, gathered information on the exchange rates of three different stocks on the Amsterdam and London stock markets (the successor markets of public debt markets where one traded in private stocks instead of public securities) and applied both methods to prove that the Dutch and English capital markets were densely integrated during the eighteenth century, even by the standards of the twentieth century.[68] Even more striking was that any trend towards closer integration in any of the three stocks was absent over the course of the century, once again emphasizing the peculiarity of the degree of integration at the beginning of the period.[69] Although scholars have often assumed that there is insufficient data for a quantitative analysis of monetary markets before the late seventeenth century, Zuiderduijn, Boerner and Volckart as well as Chilosi and Volckart showed that several regions within the European continent were already well integrated during the Late Middle Ages, each applying one of the suggested methods.[70] Chilosi and Volckart examined Central European local gold-silver ratios and investigated how the integration of medieval money markets progressed. They argued that financial markets and long-distance trade were intimately linked.[71] Boerner and Volckart, in addition to these findings, showed that only markets that participated in a currency union were significantly correlated with well-integrated money markets.[72] Jaco Zuiderduijn, rather focussing on interest payments and quantitative evidence on the occurrence of debt shares that he found in several Dutch archives, suggested that the late-medieval public sector of Holland expanded its field of operation to major cities as well as smaller towns throughout the Netherlands to which it sold several public loans.[73] Yet, the market integration that he addressed, relates to the integration of governmental debt mechanisms and shares in regional perspective rather than state level. Data on governmental interest rates enables us to address and compare the integration of debt mechanisms in the different regions that the Little Divergence theory regards as economically less sophisticated (all countries except from the Low Countries and England). The results provide a reliable and general pattern and also enable us to do some correlations in order to reach firm conclusions on price convergence. On the contrary, data on public interest rates proves to be unsuitable for calculating coefficients of variation as scholars have previously done.

Theoretically, since both measures are general indicators for the efficiency of institutions, they are expected to point in roughly the same direction. Once institutional efficiency has reduced transaction costs, institutionalists predict low interest rates and high levels of market integration. Moreover, the factors that raise the level of market integration will also mutually reinforce each other.[74] For a sustained level of exchange in public capital markets, but also in a market economy in general, reputation mechanisms are indispensable. These instruments induce people to behave well, because a defaulting borrower risks the possibility that he will be excluded from future exchange. When people are motivated

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[67] Studer, 'India and the Great Divergence' (2008).
[68] L. Neal, *The Rise of Financial Capitalism. International Capital Markets in the Age of Reason* (1990) 178.
[69] Neal, *The Rise of Financial Capitalism* (1990) 145.
[70] M.A. Denzel, 'Die Integration Deutschlands in das internationale Zahlungsverkehrssystem im 17. und 18. Jahrhundert', in: E. Schremmer (ed.), *Wirtschaftliche und soziale Integration in historischer Sicht: Arbeitstagung der Gesellschaft für Sozial- und Wirtschaftsgeschichte in Marburg 1995* (Stuttgart 1996) 64.
[71] D. Chilosi and O. Volckart, 'Money, States, and Empire: Fiancial Integration and Institutional Change in Central Europe, 1400-1500', *The Journal of Economic History* 71-3 (2011) 763.
[72] L. Boerner and O. Volckart, 'The Utility of a Comman Coinage: Currency Unions and the Integration of Money Markets in Late Medieval Central Europe', *Explorations in Economic History* 48 (2011) 53.
[73] Zuiderduijn, *Medieval Capital Markets* (2007) 186.
[74] Van Zanden, *The Long Road to the Industrial Revolution* (2009) 20-21.

to behave well, in order to assure themselves of attractive future transactions, interest rates will be low.[75] As a consequence, the efficiency of trade networks and institutions that foster regularity and trust will largely be explained by levels of creditworthiness and market integration. The functioning of public capital markets and the accessibility to cheap money are highly dependent on such reputation mechanisms.

[75] Greif, *Institutions and the Path to the Modern Economy* (2006).

# CHAPTER 2. ANALYSING PUBLIC DEBT SYSTEMS

## 2.1 Introduction

In order to trace the development of financial efficiency, i.e. the evolution of public debt markets, which also takes specific histories and differences into account, this chapter introduces a comprehensive dataset on European interest rates. The measure of the public interest rate enables a quantitative analysis on the functioning of public credit mechanisms but, as explained in the previous chapter, can also be perceived as one of the most reliable proxies for institutional success in a society as a whole. This chapter will describe the process of source collection, explain the choices that have been made during this process, and explicate the construction and measurement of data on public debt that will be presented in chapter three. In addition, this chapter discusses three different data streams that are included in the analysis, considering public debt mechanisms in 34 European states. Section 2.2 deals with the collection and appearance of interest rates in secondary sources. It also discusses the main reason for interest rates' initial occurrence in sources, namely war. Without the tremendous costs that were involved with military expeditions, the need for long-term debt finance would have been less prominent. Section 2.3, discussing the first data stream, addresses differences that existed between and within various instruments of public borrowing. It discusses the variety of loans and debt contracts that we find in the sources and explains that the latter became dominant in the early modern period. The first data stream focusses mainly on long-term funded debt, just touching upon short-term floating debt. Section 2.4, discussing the second data steam, presents qualitative evidence on market performance as it discusses the exact date that public debt instruments emerged throughout Europe. This qualitative evidence confirms the notion of Stasavage that city-states established public debt markets much earlier than territorial states, the so-called 'city-state advantage,' despite its general value and usefulness. Finally, section 2.5, discussing the third data stream, accounts for the collection and measurement of information on interest rates. It appears that Stasavage was also right about a second element of the 'city-state advantage', namely comparatively low costs of debt finance.

## 2.2 Roaming the archives for information on public debt

For a sound discussion on the long-term development of European public debt markets, it is important to acquire more knowledge on which factors made public capital markets actually emerge and, in essence, enable contemporary historians to do this kind of comparative research. Systems of public debt would have such a crucial impact on medieval European states that, given the extent in which governments relied on it, John Munro concluded that none of the municipal, territorial, or national communities were able to function without the ability to borrow.[76] But how is it possible that the emergence and evolution of public credit proved to be so important? The answer for this question must be found in the political aspirations of medieval and early modern rulers.[77] Many of them were keen on the fulfilment of their foreign policy agendas. An almost continuous state of warfare caused fiscal burdens throughout much of the continent to rise spectacularly. Because rulers increasingly recruited paid soldiers rather than conscripting troops through compulsory service, efforts to gather large armies

[76] J.H. Munro, 'The Medieval Origins of the Financial Revolution: Usury, Rentes and Negotiability', *International History Review* 25-3 (2003) 514; this point of view has been confirmed in Stasavage, *States of Credit* (2011) 29.
[77] J.I. Andrés Udenco and M. Limberger, 'Introduction', in: J.I. Andrés Udenco and M. Limberger (eds.), *Taxation and Debt in the Early Modern City* (London 2012) 6.

went hand in hand with the mobilization of large sums of money. This development from unpaid compulsory service to paid service would launch the creation of public debt.[78] The sudden need for unexpected and extraordinary war expenditures, in addition, offered another incentive to seek access to credit. Although differences always have to be considered, the greatest part of annuities were issued to finance military policies, either defensive or offensive.[79] Governments increasingly called upon the savings of bankers and private wealth holders. Beside these military objectives, the two most common reasons to issue new bonds were the consolidation or rearrangement of debts that were issued before. Unsurprisingly, these rearranged debts were in most cases related to previous war expenditures.[80] Growing debts were serviced and secured with the introduction of new indirect taxes. The struggle to find substantial amounts of money placed great stress on the governments' budgets.[81] Although debt creation avoided immediate tax increases, selling debt shares only meant deferment of taxes but certainly not cancellation. So, eventually, the necessary revenues for accumulating interest payments, consolidations or conversions had to be coughed up by the public. Although the rising fiscal burden placed great stress on the government's budgets, access to the advantageous system of public debt proved to be crucial in the political arena.

Those who search the archives for the first evidence on public debt markets, will end up in medieval sources. Between 900 and 1300, Europe experienced political fragmentation and the decentralisation of political power, ensued by warfare. At the same time, the continent saw an expansion of its economy and commercial activities. An increasing group of private individuals and entities acquired substantial amounts of liquid wealth.[82] This particular combination resulted in the emergence of several modern

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[78] P. Jones, *The Italian City State: 500-1300. From Commune to Signoria* (Oxford 1997); M. Boone, C.A. Davids and P. Janssens, 'A New Approach', in: M. Boone, C.A. Davids and P. Janssens (eds.), *Urban Public Debt: Urban Government and the Market for Annuities in Western Europe, 14th-18th centuries* (Turnhout 2003) 6.

[79] Several papers on this issue are provided by M. Boone, C.A. Davids and P. Janssens (eds.), *Urban Public Debt: Urban Government and the Market for Annuities in Western Europe, 14th-18th centuries* (Turnhout 2003), for instance W. Fritschy, 'Three Centuries of Urban and Provincial Public Debt: Amsterdam and Holland', in: Boone, Davids and Janssens (eds.), *Urban Public Debt* (2003) 76-78; F. Piola Caselli, 'Public Debt, State Revenue and Town Consumption in Rome (16th-18th centuries)', in: Boone, Davids and Janssens (eds.), *Urban Public Debt* (2003) 93-97; See also Stasavage, *States of Credit* (2011) 25-29; M.C. 't Hart, 'The Merits of a Financial Revolution: Public Finance, 1550-1700', in: M.C. 't Hart, J. Jonker and J.L. van Zanden (eds.), *A Financial History of The Netherlands* (Cambridge 1997) 16-17 and 22-26.

[80] Boone, 'Introduction' (2003) 8.

[81] W.M. Ormrod, 'The West European Monarchies in the Later Middle Ages', in: R. Bonney (ed.), *Economic Systems and State Finance* (Oxford 1995) 142-143: Ormrod argues that as early as the Hundred Years' War, England and France had an enormous debt; W. Fritschy, 'A 'Financial Revolution' Reconsidered: Public Finance in Holland during the Dutch Revolt 1568-1648', *Economic History Review* 56-1 (2003) 63-67 argues that the young Dutch Republic relied heavily on its systems of taxation and public debt to sustain its military budget and survive within the European power struggle.[81] Evidence for other places is provided by W.M. Bowsky, *The Finance of the Commune of Siena 1287-1355* (Oxford 1970); L. Pezzolo, 'The Venetian Government Debt 1350-1650', in: Boone, Davids and Janssens (eds.), *Urban Public Debt* (2003) 61-74; B. Fuhrmann, 'Taxation and Debt in Early Modern German Cities', in: Andrés Udenco and Limberger (eds.), *Taxation and Debt in the Early Modern City* (2012) 181-196; G. Bognetti and G. De Luca, 'From Taxation to Indebtedness: The Urban Fiscal System of Milan during the Austrias Domination (1535-1706)', in: Andrés Udenco and Limberger (eds.), *Taxation and Debt in the Early Modern City* (2012) 29-48; L. García, 'Taxation and Debt in the Early Modern Castilian Cities: The Case of Seventeenth-Century Madrd,' in: Andrés Udenco and Limberger (eds.), *Taxation and Debt in the Early Modern City* (2012) 85-100.

[82] Van Zanden, *The Long Road to the Industrial Revolution* (2009) 12 and 34.

structures and institutions as well as the first public debt mechanisms.[83] Those who search the archives for material on interest rates will also notice that profound information on interest rates is difficult to obtain. This is mainly because of a lack of sources.[84] It is also the main reason that European public capital markets have not yet sufficiently been discussed. The collection of this sort of data is therefore an ambitious project. Before 1250, the number of observations is extremely limited because the capital market was thin.[85] While the importance of war existed from an earlier date, European states faced serious constraints in the establishment of debts before 1250, since few private individuals had enough liquid wealth to provide credit. The number of observations increases after 1250, which is the main reason why the analysis of interest rates starts from this year onwards. For later periods, however, it proves to be almost as difficult to find profound information on interest rates. This paper observes the period until 1800, because most accounts on the Little Divergence discuss pre-modern economic development until the period that the British Industrial Revolution began to spread over the European continent and the French Revolution stirred European countries to a new age of mutual understanding.

Although information on interest rates proves to be hard to obtain, public capital markets have not suffered from a complete lack of historical interest. However, scholarly efforts have resulted in much fragmented material. Most historians, researching the evolution of capital markets, have concentrated on very specific cities or regions during a very specific period of time.[86] A broader overview of the evolution of public credit, which is also suitable for profound comparisons, has not been provided yet. Nevertheless, a comparative analysis on interest rates for a large number of different states is able to build upon three studies that already compiled a lot of data. The work of Sidney Homer and Richard Sylla is useful because it compiled prevailing rates within a broad spatial perspective and because it covers a very long period of time.[87] Although Homer and Sylla do provide data on interest rates for the period from 1250 to 1800, it proved to be too fragmented and incomplete for the reconstruction of a serried development. Epstein was the first to collect more reliable and specific data on public credit.[88] His data, however, contains a lot of inaccuracy, rough figures and long-term averages. Building upon Epstein's database of interest rates, Stasavage extended the knowledge on public capital markets with several new states over a longer period of time.[89] Although Epstein's and Stasavage's datasets proved to be insufficient to make any solid comparisons between different European regions, their works have definitely opened doors for this research. The collection of interest rates began with a consultation of their sources and a retracement of their steps. Through thorough analysis of these sources individually as well as in relation to others data sources, new data was compiled to bridge gaps in the dataset. This enabled the construction of a database that enhances both Epstein's and Stasavage's work. It includes several new states, altogether 34, and covers a broader period of time. Moreover, the new dataset is in a considerable number of cases more accurate. Most important, in comparison with previous studies, the database relies on a considerably larger number of sources.[90] The following sections elaborate three different data streams that enable both a qualitative and quantitative analysis on economic performance.

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[83] Van Zanden, *The Long Road to the Industrial Revolution* (2009) 32-65.
[84] *Ibidem,* 19.
[85] *Ibidem,* 22.
[86] Some of these contributions have been collected in: Boone, Davids and Janssens (eds.), *Urban Public Debt* (2003).
[87] S. Homer and R. Sylla, *A History of Interest Rates,* third edition (New Brunswick and London 2005) 2.
[88] Epstein, *Freedom and Growth* (2000) 20-23.
[89] Stasavage, *States of Credit* (2011) 30-31.
[90] These sources are summarized in Appendix C.

### 2.3 Defining instruments of public debt finance: differences, variations and deviations

The presence of war, the main incentive for public debt creation, seems to have affected the whole European continent.[91] However, for a historian, it is highly relevant to get exact understanding in when and where governments created institutions for debt finance because the emergence of risky transactions serves as a qualitative approach to the issues of market and therefore economic performance. However, in order to determine when and where such institutions made their first appearances, it should be defined what constitutes a fully functioning public debt system. Although the combination of increased warfare and accumulating capital has certainly contributed to the appearance of public debt markets throughout the continent, public debt appeared in a high variety across different cities and regions, making comparisons a highly challenging task. Nevertheless, with some simplification we can make a distinction between two different vehicles of public debt finance. A first group of states directly approached rich individuals or entities, mostly international merchants, to contract loans with repayment in no more than one or two years. These short-term loans were often issued at very high rates of interest.[92] Floating debts were largely contracted by borrowers whose creditworthiness was in doubt. These governments were not able to find moneylenders that had a long-term confidence in the borrowing state and were prepared to contract a loan with repayment in a distant future.

Another group of states accomplished to create more efficient instruments of long-term borrowing, i.e. the creation of a funded debt, taking a step further than the former group of states. The creation of long-term debt had the relative advantage that it allowed states to obtain access to lower-costs finance because of lower rates of interest. This type of instrument, indicating the existence of an organized and fully functioning public credit market, was an urban invention and was introduced in the twelfth century.[93] Italian city-states pioneered in the development of organized public long-term debt and experimented with instruments that only contained rough contours of early modern versions.[94] The basic institution was invented by Genoa in the mid twelfth century.[95] Whenever the city government needed to finance a major enterprise, it formed a syndicate or *compera* of investors to provide the necessary capital. In order to fund the interest and repayment, the municipality awarded the *compera* with the ownership of a tax which had usually been created for the purpose. Such systems of funded debt subsequently became permanent and, in the thirteenth century, the Italian city-states converged on the use of it as their most important vehicle of debt finance.[96] The Italian city-states are commonly considered as pioneers in the creation of long-term public debt, although they actually funded their debt through a consolidation of forced loans.[97] Because of the involuntary character of these loans, Julius

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[91] After consideration of the evidence that is provided in notes 79 and 81.

[92] Munro, 'The Medieval Origins of the Financial Revolution' (2003) 505.

[93] Stasavage, *States of Credit* (2011) discusses the urban origins of public debt.

[94] For a general history on public debt finance see: Munro, 'The Medieval Origins of the Financial Revolution' (2003); J.D. Tracy, 'On the Dual Origins of Long-Term Urban Debt in Medieval Europe' in: Boone, Davids and Janssens (eds.), *Urban Public Debt* (2003) 13-24; M. Kohn, *Finance before the Industrial Revolution: An Introduction,* Working Paper 99-01 (1999).

[95] Kohn, *Finance before the Industrial Revolution* (1999) 9; Munro, The 'Medieval Origins of the Financial Revolution (2003)' 514; Tracy, 'On the Dual Origins of Long-Term Urban Debt in Medieval Europe' (2003) 20.

[96] Munro, 'The Medieval Origins of the Financial Revolution' (2003) 514-515; Stasavage, *States of Credit* (2011) 33.

[97] Forced loans can be found almost everywhere in the Middle Ages: Tracy, 'On the Dual Origins of Long-Term Urban Debt in Medieval Europe' (2003) mentions France during the twelfth and thirteenth centuries.

Kirshner argued that they actually were more a tax than a public loan.[98] Indeed, Luciano Pezzolo, writing on Venice, confirmed that investors were increasingly regarding themselves as taxpayers. According to Pezzolo, a true public debt did only emerge in the sixteenth century.[99] However, there is evidence that wealthy citizens preferred forced loans to the alternative of direct taxation.[100] Moreover, subscribers received a marketable asset for which a free secondary market developed since the early fourteenth century.[101] For these reasons, historians have also suggested that interest on Italian forced loans do reflect institutional efficiency. In the following, this issue will be discussed in greater detail. It is argued why this 'Italian model' of forced loans is perceived as a correct vehicle of long-term debt.

Outside Italy, during the thirteenth century, a growing number of French, Flemish and German cities developed another vehicle of public finance and obtained credit by selling loans on the open market, possibly because these towns lacked the power of coercing their own citizens as effectively as the Italian city-state governments could.[102] These voluntary debt contracts or annuities (*rentes* in French or *renten* in Dutch and German) originated from a form of private investment in agricultural economies by which a private financier supplied a considerable amount of capital to a private borrower in return for a perpetual income. When northern European cities applied the same principle on instruments of public finance, it involved the same permanent transfer of capital to the borrower.[103] The lender received a fixed and regular income in return. Although historians point to several contracts to be the first real annuity for which documentation survived, however, it is clear that the first annuity emerged in early thirteenth-century northern France.[104] Next, from the fourteenth century onwards, this 'annuities model' slowly began to surpass the 'Italian model' of forced loans.[105] Cities and towns in the Low Countries, Germany, Switzerland and Catalonia followed the example of northern France in the thirteenth and fourteenth century.

The northern European system of municipal debt would eventually develop into the standard for long-term borrowing in Europe, also employed by the larger territorial states. Historians have not agreed where and when the first true 'Financial Revolution' or transformation of short-term to long-term national debt occurred.[106] The term was first applied to England by Peter G.M. Dickson, arguing that the first long-term national debt was created with the establishment of the Bank of England.[107] In a comparable way, Dickson's idea was applied to the French monarchy by Paul Cawès and Earl Hamilton,

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[98] J. Kirshner, 'States of Debt', Paper presented to the Mellon Sawyer Seminar on Debt, Sovereignty and Power, Cambridge University (2006).
[99] Pezzolo, 'The Venetian Government Debt 1350-1650' (2003) 61-74.
[100] Munro, 'The Medieval Origins of the Financial Revolution' (2003) 516.
[101] Fynn-Paul, 'The Land Commenda in the Late Medieval Crown of Aragon' (under submission) 4; Munro, 'The Medieval Origins of the Financial Revolution' (2003) 515-516; Munro, 'The Medieval Origins of the Financial Revolution' (2003) 516.
[102] J.D Tracy, *A Financial Revolution in the Habsburg Netherlands: Renten and Renteniers in the County of Holland, 1515-1565* (Berkeley, Los Angeles and London 1985) 219.
[103] Munro, 'The Medieval Origins of the Financial Revolution' (2003) 518-519.
[104] Tracy, 'On the Dual Origins of Long-Term Urban Debt in Medieval Europe' (2003) 16, points at Rheims in 1218; Munro, 'The Medieval Origins of the Financial Revolution' (2003) 524, points at Troyes in 1228.
[105] Boone, 'Introduction' (2003) 7.
[106] For this concept with respect to the Late Middle Ages see: Munro, 'The Medieval Origins of the Financial Revolution' (2003) and Tracy, 'On the Dual Origins of Long-Term Urban Debt in Medieval Europe' (2003).
[107] P.G.M. Dickson, *The Financial Revolution in England: A Study in the Development of Public Credit, 1688-1756* (London, 1967).

while James Tracy applied the term to the Habsburg Netherlands.[108] Although not all of its debt arose from the voluntary purchase of annuities and, for this reason, some have argued that we cannot speak of a true Financial Revolution, at the very end of the fifteenth century, Castile was the first among the larger territorial states to turn a number of national short-term debt into long-term debt shares (on which exists also evidence for interest payments).[109] However, it remains difficult to make firm conclusions. Historians have not reached a consensus yet. Fynn-Paul noticed a mobilization of public savings in Aragon during the 1360s and therefore suggested that the first territorial state to undergo a Financial Revolution was arguably a Catalonian one.[110] Similarly, Zuiderduijn questioned Tracy's argument about the Dutch Financial Revolution by suggesting that collective public debt existed centuries before sixteenth-century Holland began to issue *gemenelandsrenten* on provincial level. According to Zuiderduijn, Tracy's revolution should be considered as the *grand finale* of a financial evolution, a next step in a gradual process of the institutionalization and organization of the States of Holland.[111] Nonetheless, regardless of which territorial state first created long-term debt, section 2.4 will show that it did not take very long before most territorial states moved to create long-term national debts in rapid succession.

In examining and comparing the developments of different public debt markets, it must also be addressed that governments and annuity buyers could choose between different forms of long-term debt contracts. Firstly, governments issued the traditional perpetual or hereditary annuity (*rente héritable* in French or *erfelijke rente*, *erfrente*, and *losrente* in Dutch). Later, a different type of debt contract emerged that extinguished at the subscriber's death. Because this annuity was issued for one life in principal, it was called a life annuity (*rente viagère* or *lijfrent*). However, some life annuities were issued for two or even three lives, in which cases the contract was transferred to the next of kin w2hen the initial subscriber died. For both types of contracts in principal there was no question of a loan in the sense that a borrower repaid the sum of money that a lender had provided. The lender gave a certain amount of money in exchange for a regular payment of interest which was considered as a (partial) repayment of the borrowed capital. In principal, although a lot of exceptions existed, the borrower could not stop the contract and payment of interest by redeeming the capital sum.[112] For this reason, the perpetual annuity evolved into the redeemable bond. This innovation enabled European governments to relieve itself from the fiscal stress of interest payments by repaying the entire capital sum to the annuity buyer. As long as a government had the possibility to redeem the borrowed capital at face value, long-term debt repayment did not completely engross the total government's budgets. Indeed, in

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[108] P. Cawès, 'Les Commencements du Crédit Public en France', 97-123 and 825-865; E. Hamilton, 'Origin and Growth', 118-119; Tracy, *A Financial Revolution in the Habsburg Netherlands* (1985) 28-70. For a description of this debate see: Munro, 'The Medieval Origins of the Financial Revolution' (2003) 505-506 and 536-542.

[109] Table 1 and App. A; A.F. Ruiz Martín, 'Procedimientos crediticios para la recaudación de los tributos fiscales en las ciudades castellanus durante los siglos XVI y XVII. El caso de Valladolid', in: A. de Otazu (ed.) *Dinero y Crédito* (Madrid 1978) 37-47; However, there is no clear consensus on this: Munro, 'The Medieval Origins of the Financial Revolution' (2003) 536; According to Zuiderduijn, *Medieval Capital Markets* (2007) 183, the States of Holland as a public body first sold *renten* in 1482. For the concept of the Financial Revolution in the late medieval Crown of Aragon see M. Sánchez Martínez, *La Deuda Pública En La Cataluña Bajomedieval*. (Madrid 2009).

[110] Fynn-Paul, 'The Land Commenda in the Late Medieval Crown of Aragon' (under submission) 5.

[111] Zuiderduijn, *Medieval Capital Markets* (2007) 78 and 184.

[112] H.J. Gilomen, 'La Prise de Décision en Matière d'Emprunts dans les Villes Suisses au 15e siècle', in: Boone, Davids and Janssens (eds.), *Urban Public Debt* (2003) 127-148. This account on tax and debt management in Swiss towns mentions a few forced repayments by way of exception in the late fifteenth century.

practice, many of them issued long-term loans without an agreed redemption date because it gave them the possibility to end repayments when possible or when the rate of interest became so high that this proved to be beneficial.[113] These types of long-term investment became very popular with the public. In sixteenth-century Amsterdam, for instance, the government had to distribute new issued annuities over a large part of the city's population in keeping everybody satisfied.[114] An annuity was acquired for its particular value as an insurance instrument.[115] Although annuities were issued for a long period and payment was not assured, they were negotiable on the secondary capital market. The alternative, the investment in trading activities was also a risky business. Moreover, if a government proved to be a reliable partner, the lender was assured of a fixed income. A government that proved its reliability by not defaulting on its repayments, on the other hand, gained access to a capital market where money was obtainable very quickly and cheaply.

The discussion on the creation of various long-term debt instruments throughout Europe directs to the purpose of the first data stream that the database contains. Public debt systems appeared to be very different from each other, what forces the analysis to distinguish between different types of debt instruments. Hence, this data stream differentiates between short-term and long-term loans, with a further differentiation between life and perpetual annuities. Firstly, following the discussion on short-term and long-term debts, the database principally consists of rates of interest paid over long-term funded debt, because they "measure the borrower's financial and institutional credibility more accurately than short-term money market rates."[116] A debt share is generally determined long-term if it is obviously issued for more than one year. In the cases that long-term debt mechanisms did not exist yet, however, short-term loans are still incorporated in the data stream. If a state was not able to establish a system for long-term credit, the higher amount of interest paid on these debt shares implies that the state in question did not reach equal levels of institutional performance. Moreover, the incorporation of short-term loans in the analysis enables us to compare the efficiency of states before long-term debt instruments were constructed. The most noteworthy example of a state that created long-term debt finance very late was England. Its government relied on short-term loans and paid high rates of interest until the end of the seventeenth century. This information on short-term loans is present in the data stream. States that already constructed a vehicle for long-term debt finance could of course still resort to floating debt. These loans have not been incorporated in the database. Hence, when England began to issue long-term loans, from 1693 onwards, the data stream only provides information on its long-term debt.

Secondly, the data stream distinguishes between life and perpetual annuities. The analysis considers loans as perpetual if they are clearly issued for a period of more than ten years. In order to enable a quantitative comparison between these different types of annuities, Munro's presumption has been followed that annual payments of interest on single life-annuities were always higher and sometimes even twice as high as perpetual-annuities, although they were always lower than interest rates on short-term loans.[117] As explained in chapter one and discussed in relation to the higher interest rate on short-term loans, lower interest rates imply a higher level of trust over a longer period.[118] Because the length

[113] Munro, 'The Medieval Origins of the Financial Revolution' (2003) 559.
[114] Tracy, *A Financial Revolution in the Habsburg Netherlands* (1985) 17.
[115] Kohn, *Finance before the Industrial Revolution* (1999) 6.
[116] Epstein, *Freedom and Growth* (2000) 18.
[117] Munro, 'The Medieval Origins of the Financial Revolution' (2003) 519 and 559.
[118] See the theoretical framework elaborated in chapter one.

of contracts had immediate consequences for the differences in interest paid over short-term and long-term loans, it also contributed to the differences in interest paid over life and perpetual annuities. Moreover, according to Munro, perpetual annuities could have been cheaper due to their marketability.[119] Hence, as soon as evidence suggests the existence of perpetual annuities, the database only mentions the rates related to this vehicle of debt finance. It implies that governments achieved a higher degree of institutional credibility. As a result, as time passes, more and more rates concern the interest paid over perpetual annuities.

### 2.4 Qualitative approach to the emergence of public debt: the '*city-state advantage*'

Because the emergence of public debt systems serves as a qualitative indicator of economic performance, the database's second data stream presents information on the year for which we have evidence that states issued public debt shares. For many of the early political entities, however, it is hard to point to an exact date because their governments did not keep systematic public accounts. As was the case with the exact determination of the first Financial Revolution, for the majority of states historians have not reached a consensus on the exact date that public debt instruments were established for the first time. That is why this data stream refers to the first year in which there is observable information on interest rates available.[120] In some cases, this way of measuring results in substantial time difference with what scholars have suggested. In Genoa, for instance, the first evidence for a fully functioning debt mechanism with payment of interest is found for the year 1303. As mentioned before, however, there is evidence that the Genovese government issued its first long-term loan some 150 years earlier. Such a time difference is also observable in the case of Ghent, where the dataset mentions the year 1353 while other authors argued that the first long-term debt issuance took place in 1275.[121] However, this method can be considered as most profound in order to acquire reliable comparisons.

In their historical surveys on the first emergence of public debt finance, historians have distinguished between two types of public credit mechanisms.[122] They argued that, throughout Europe, city-states created on average long-term public debts considerably earlier than territorial states did. Stasavage, in addition, showed how general this phenomenon of the 'city-state advantage' was. He revealed the existence of a substantial time lag between the first issuance of long-term debts in city-states, the majority of which we have a record of such a debt before 1400, and territorial states, where the first long-term debts were created around the end of the fifteenth century.[123] Stasavage has also delivered explanations for this city-state advantage. It can be argued that city-states were more vulnerable for inclusion by larger territorial competitors. Nevertheless, territorial governments could have profited from long-term borrowing just as much as city-states did because they were also engaged in expensive wars with neighbours. Moreover, as elaborated before, the reliance on short-term borrowing had some remarkable disadvantages. It put rulers under greater financial pressures due to much higher interest

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[119] Munro, 'The Medieval Origins of the Financial Revolution' (2003) 519 and 559.
[120] The same measure is used by Stasavage, *States of Credit* (2011) 30.
[121] Stasavage, *States of Credit* (2011) 31; J.H. Munro, 'The Usury Doctrine and Urban Public Finances in Late-Medieval Flanders', in: *La Fiscalità nell' Economia Europea* (2008) 989-990.
[122] Most prominently including: Epstein, *Freedom and Growth* (2000) 21-25; Kohn, *Finance before the Industrial Revolution* (1999; Tracy, 'On the Dual Origins of Long-Term Urban Debt in Medieval Europe' (2003); Munro, 'The Medieval Origins of the Financial Revolution' (2003).
[123] Stasavage, *States of Credit* (2011) 28-32.

rates. In addition and equally relevant, the amount of money that territorial rulers could raise with short-term borrowing was limited compared to what city-states raised with long-term borrowing.[124]

In line with the theoretical assumptions of this research, Stasavage has argued that the existence of a city-state advantage has a strong relationship with differences in levels of institutional efficiency and creditworthiness. Stasavage argued that city-state governments were more likely to attain access to credit because their political frameworks were characterized by an intensive form of representation. Parliamentary activity increased the government's credibility since it assured its subscribers that it would not default on contracted debts and meet full payment of interest. In comparison to territorial entities, such active representative assemblies were more likely to be sustained in geographically small city-states because their size reduced communication and travel costs. Wim Blockmans and James Tracy made comparable arguments in explaining the intensity of representation in Flanders and the Dutch Republic.[125] Secondly, city-states enjoyed an advantage over territorial states because their political institutions had an extraordinary composition. According to Stasavage, property rights and creditworthiness were enhanced in cities where the states' wealth holders and creditors were also predominant among the political elite, so, where interests of the state and merchants overlapped.[126]

Table 1 summarizes the 34 states that are included in the data stream and thus proved to be appropriate for inclusion in this paper's analysis. In categorizing the data, the analysis makes a distinction between different European regions. These include northwest Europe (England, the States of Holland and several city-states in the Low Countries), southern Europe (Spain and Italy), central Europe (Denmark, Germany, Austria and Switzerland), and individual territorial entities such as France (because the literature is not really clear about its position in relation to north and south Europe), Poland and Russia.[127] Hence, it applies a similar categorization of Europe as the Little Divergence literature. Unfortunately, because the composition of data is determined by the availability and accessibility of sources, eastern Europe is not richly covered. Beside the regional categorization, the distinction between territorial and city-states has been maintained as well. Within this presentation of included states, the table presents the first and final years for which data on interest rates has been found.

Table 1 suggest that city-states reached the level of efficiency that enabled them to create instruments of debt finance remarkably earlier than territorial states. Hence, although this data stream allowed for some notable improvements of his overview, Stasavage was right about the timing of public debt systems in the main.[128] A difference between city-states and territorial states is very obvious in each of the different regions. Because a relatively safe method is applied in determining the first emergence, the difference between the two systems would only increase as it is probable that public debt systems were created somewhat earlier in city-states than this measure suggests. In general, one can assume that

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[124] Stasavage, *States of Credit* (2011) 34-35; Short-term loans were issued at a higher amount of interest. For this discussion see: E.B. Fryde and M.M Fryde, 'Public Credit, with Special Reference to North-Western Europe', in: *The Cambridge Economic History of Europe: Volume III Economic Organization and Policies in the Middle Ages* (Cambridge 1963) 430-440.

[125] W. Blockmans, 'Le régime représentatif en Flandre dans le cadre européen au bas Moyen Âge avec un projet d'application des ordinateurs', in: *Album Elémer Malyusz* (Brussels 1976); J.D. Tracy, *Holland under Habsburg Rule 1506-1566: The Formation of a Body Politic* (Berkeley 1990). The idea that geographical scale mattered, has been most prominently emphasized by the work of Wim Blockmans.

[126] Stasavage, *States of Credit* (2011) 1-2.

[127] This distinction has been maintained in Appendix A.

[128] Stasavage, *States of Credit* (2011) 28-32.

**TABLE 1. OVERVIEW OF STATES INCLUDED IN THE ANALYSIS**

| | |
|---|---|
| **Central Europe** | |
| City-States:<br>▪ Zurich (1325-1414)<br>▪ Hamburg (1350-1600)<br>▪ Cologne (1351-1474)<br>▪ Bremen (1357-1798)<br>▪ Dortmund (1375-1399)<br>▪ Nuremberg (1381-1565)<br>▪ Basel (1383-1479)<br>▪ Mainz (1400-1444)<br>▪ Geneva (1538-1681) | Territorial States:<br>▪ Saxony (1496-1497)<br>▪ Württemberg (1550)<br>▪ Austria (1555-1780)<br>▪ Denmark (1700-1799)<br>▪ Holy Roman Empire (1740-1780) |
| **Southern Europe** | |
| City-States *(Italy)*:<br>▪ Genoa (1303-1785)<br>▪ Florence (1347-1499)<br>▪ Venice (1262-1785)<br><br>City-States *(Spain):*<br>▪ Barcelona (1360-1640) | Territorial States *(Italy):*<br>▪ Bologna (1500-1699)<br>▪ Naples (1520-1799)<br>▪ Rome (1526-1785)<br>▪ Milan (1540-1785)<br>▪ Tuscany (1550-1785)<br>▪ Piedmont (1630-1785)<br><br>Territorial States *(Spain):*<br>▪ Castile (1489-1779) |
| **Northwest Europe** | |
| City-States:<br>▪ Arras (1241)<br>▪ Douai (1295-1399)<br>▪ Bruges (1299-1492)<br>▪ Ghent (1353-1399) | Territorial States:<br>▪ Holland (1522-1800)<br>▪ England (1692-1798) |
| **Other** | |
| Territorial States:<br>▪ France (1522-1793)<br>▪ Poland (1744-1755)<br>▪ Russia (1760-1800) | |

governments had to meet crucial conditions before they were able to attract long-term investments, city-states proved to be not only more successful in achieving this aim but also economically more successful. Because long-term annuities were in itself risky transactions, instruments of long-term debt finance required a reliable institutional framework that provided investors with security.[129]

[129] Zuiderduijn, *Medieval Capital Markets* (2007) 188.

At first glance, linking this quantitative evidence to the issue of economic performance, table 1 seems to support contributions that have suggested a strong relationship between institutional efficiency and economic growth. In Aragon, for instance, Fynn-Paul discovered that the peak of debt finance was concentrated around 1300, corresponding with the commercial boom that it experienced during the thirteenth and fourteenth century.[130] Blockmans argued that a city dominated by commerce, industry, and ruled by an urban and mercantile elite, characterized itself with a high concentration of available capital and the presence of a political framework of the kind that Stasavage described.[131] Economists normally reckon the presence of commercial exchange as an important step forwards because it tends to increase living standards not only for merchants but rather collaterally for a wider group of beneficiaries. Therefore it is believed that commercial wealth produces a higher rate of economic growth. Landed wealth, in contrast, is considered as lacking these collateral effects.[132] Public debt finance tended to mobilize the savings of wealthy merchants, enabling investments for productive purposes, instead of unproductive investments as real estate. Although public debt mechanisms remained a comparatively limited form of mass mobilization of savings, as previously discussed, they could have ignited these and similar developments towards truly mass mobilization of savings.[133] The places where commercial activity flourished and where public debt was created, seem to be closely related. Although evidence for such a direct relation between public debt markets and economic growth has not yet been provided, we do know that many significant technological innovations actually occurred within city-states.[134] Besides, Bosker, Buringh and Van Zanden showed that city-states experienced faster rates of population growth between 1000 and 1800 than cities that were subjected to the authority of a territorial ruler.[135] This indicates that in city-states, where institutional improvements were achieved and where one experimented with public capital markets, commercial activity and economic growth was enhanced. Following the institutional approach on economic development, the evolution of representative institutions, public debt markets and economic development in city-states seems to indeed have gone hand in hand.[136]

### 2.5 Tracing public credit markets: the measure of interest rates

The third and most important data stream, directly referring to the issue of institutional efficiency, provides annual rates of interest in 34 different states from 1250 through 1800. It originates from an extensive compilation of interest rates that several authors have delivered for different states during

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[130] Fynn-Paul, The Land Commenda in the Late Medieval Crown of Aragon (under submission) 5.

[131] W. Blockmans, 'Voracious states and obstructing cities: an aspect of state formation in pre-industrial Europe', in: C. Tilly and W. Blockmans (eds.), *Cities and the rise of States in Europe, AD 1000 to 1800* (Boulder 1994) 228-234, Blockmans labelled these cities or city-states as 'bargaining metrepoles'; Zuiderduijn, *Medieval Capital Markets* (2007) 81, also pointed to the reciprocity of public debt creation and institutional creation.

[132] Fynn-Paul, The Land Commenda in the Late Medieval Crown of Aragon (under submission) 3.

[133] *Ibidem,* 4.

[134] J. Mokyr, 'Urbanization, Technological Progress and Economic History', in: H. Giersch (ed.), *Urban Agglomeration and Economic Growth* (1995) argued that several autonomous cities thanked their economic development to industrial innovation and the development of industries; J. Hicks, *A Theory of Economic History* (Oxford 1969) offered a comparable account with regard to the development of trade; M. Bosker, E. Buringh and J.L. van Zanden, 'From Baghdad to London: the Dynamics of Urban Development in Europe and the Arab World, 800-1800', Mimeo, International Institute of Social History (2008) delivered empirical evidence.

[135] Bosker, Buringh and Van Zanden, 'From Baghdad to London' (2008).

[136] Although in oligarchic city-states economic growth and dynamic halted, for example: D. Acemoglu, 'Oligarchic versus Democratic Societies', *Journal of the European Economic Association* 6-1 (2008) 1-44.

different periods. The process of connecting a high quantity of secondary sources in one analysis includes general methodological issues that deserve our special attention. In solving these issues, there is largely handled as previous scholarship did. In several cases, various sources deliver different rates for the same state and year. When these contradict each other (by offering very different numbers), a deliberate choice has been made to prefer the one above the other. The most common reason is that more recent research has found evidence on debt shares that matches better with the data from one of the two contradicting sources.[137] When no considerable difference exists between various sources, both sources are incorporated in the data stream. In these cases an average interest rate is delivered.[138] In the few cases that sources provide evidence for more than one loan with different interest rates, the data stream delivers an average as well. This is the case for instance in Dickson's detailed description of England's governmental borrowing during the late seventeenth and early eighteenth century.[139] On 24 April 1694, according to Dickson, the Crown issued 8 percent interest to raise a sum of 1,200,000 pounds. The state could repay the sum on one year's notice after 1706. In the same year, a sum of 300,000 pounds was raised by issuing annuities for one, two, and three lives, at respectively 14, 12 and 10 percent. For these and comparable cases, the average of rates has been taken. It is clear that the loans on which the Crown paid 8, 10 and 12 percent were issued for longer than ten years. The 14 percent loans are considered a life annuity. For that reason, the dataset depicts an average interest rate of 10 percent on English perpetual annuities in the year 1694.[140] In other cases, sources offer average rates over a longer period of time. These rates are incorporated when no more specific data is available.[141] Ideally, the data on interest rates would be complemented with information on the quantity that states borrowed. Although it would not directly influence the depicted rates of interest (and therefore is not directly necessary for this quantitative measure), it would supplement the picture with more information on the relevance of that rate. This evidence, however, is even scarcer than the evidence on interest rates.[142]

Although the collection of interest rates began by retracing the steps from Epstein and Stasavage, a consultation of the sources that these authors used, learns that they did not always agree about the nature of the loans. In several cases, Stasavage redefined Epstein's classification. Several interest rates that Epstein defined as short-term were reported as long-term loans by Stasavage. Epstein classified all life annuities as short-terms, while Stasavage correctly classified them as vehicles of long-term debt. Stasavage is also followed in excluding several rates that Epstein classified as long-term but actually were short-term, as was the case for the rates reported for Vicenza and Verviers.[143] So, in most of these cases,

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[137] Of course, the dataset accounts for these choices.

[138] Also in this case, the individual numbers which contributed to these averages, are delivered in the dataset.

[139] Dickson, *The Financial Revolution in England* (1967).

[140] *Ibidem,* 48-49.

[141] This is most notably the case in: Fryde and Fryde, 'Public Credit' (1963); L. Pezzolo, 'Republics and principalities in Italy', in: Yun-Casalilla, B., P.K. O'Brien and F.C. Comin (eds.), *The Rise of Fiscal States. A Global History 1500-1914* (2012) 267-284.

[142] Stasavage, *States of Credit* (2011) 39.

[143] From the sources that Epstein consults becomes not clear what the term or characteristics are from the loans that are issued in the case of Vicenza and Verviers. In the case of Saxony, my information is based on Fryde and Fryde, 'Public Credit' (1963) 239-253. This interest rate concerns a loan from the Bishop of Meissen to the prince of Saxony. Although it there is insufficient information on the exact characteristics of this loan, this interest rate is included in the dataset because of its low rate and early issue date. Its low rate makes it highly improbable that it concerns a short-term loan. This is not the case for both Vicenza and Verviers. The effect of leaving this rates out will not make any substantial difference in my comparison because it only concerns a few data.

Stasavage's redefinition has been followed. For Siena, however, Stasavage classified the interest rates from Bowsky as long-term and therefore included these rates in his dataset. After consulting this source, it appears that Bowsky mentions the period for which these loans were issued. Just one of the loans on which information is available appeared to be issued for longer than six months, substantially lower than the criterion of one year.[144] For this reason, Sienna's debt shares are reclassified and considered as floating debt.

Comparisons between interest rates, provided by various secondary sources, imply methodological issues that need to be addressed. Firstly, in order to compare the cost of borrowing across Europe, it is preferable that a common measure can be applied for all states under consideration. However, the number of states and duration of the period under examination makes this unfeasible. Because material on interest rates is scarce, historians have been innovative to collect them. Different methods have been used to calculate interest rates. For most states, secondary sources offer information on the nominal rate of interest when the debt was issued. In some cases, however, there is information on the rate that government debts yielded on secondary markets. Such rates provide the best proxy of a government's creditworthiness. A final group of sources offer fiscal data which can be used to calculate a proxy measure of interest rates.[145] Hence, with a method that was suggested by Sussman and Yafeh, the ratio between the annual payment of interest and the total amount of the issued debt can be considered as the rate of interest. During the compilation of information for this database, this fiscal proxy was only applied when nominal rates were absent.[146]

Secondly, following the discussion on the Italian and annuities models, it has to be addressed to what extent interest rates on Italian loans really measure institutional creditworthiness. Although Kirshner and Pezzolo argued that forced loans should be perceived as taxes, this analysis follows Epstein and Stasavage in suggesting that it is reasonably to incorporate them because "the ability of states to establish forced loans at an early date and to obtain finance at relatively low cost really depended on the perceived creditworthiness of these city state governments."[147] The role of forced debt finance was rather huge considering the amount of money raised through it in comparison with the volume raised with short-term loans.[148] The contracts seem to have been highly popular among investors.[149] Moreover, the nominal interest rates paid on forced loans were often comparable with their profit on the secondary market.[150] Most important, in the period after 1500, which is most important for an analysis concerning the Little Divergence theory, voluntary annuities became the standard as the issuance of forced loans disappeared.[151]

Thirdly, there are several phenomena that the presented interest rates do not and in the most cases cannot capture. One of these phenomena is the selling of debt for less than face value, that occurred especially in states which were intermingled in warfare and experienced financial distress. When bonds

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[144] Bowsky, *The Finance of the Commune of Siena* (1970) 340-354.
[145] This is particularly the case for data on Nuremberg, Hamburg, Milan (during the sixteenth and seventeenth century), France (during the seventeenth century) and Holland (during the seventeenth and eighteenth century).
[146] N. Sussman and Y. Yafeh, 'Institutional Reforms, Financial Development and Sovereign Debt: Britain 1690-1790', *Journal of Economic History* 66-4 (2006) 906-935.
[147] Stasavage, *States of Credit* (2011) 34.
[148] Pezzolo, 'The Venetian Government Debt 1350-1650' (2003) 61.
[149] Kohn, *Finance before the Industrial Revolution* (1999) 11, Kohn informs us that in Genoa, some 11,000 names appeared on the share register, including foreigners and middleclass citizens.
[150] Stasavage, *States of Credit* (2011) 9.
[151] Pezzolo, 'Republics and principalities in Italy' (2012) 277.

were sold against discount the government had to hand over higher interest rates as a built-in gain for the creditor. Hence, although several sources took this practice into account, it is inevitable that some interest rates will be slightly underestimated.[152] In trying to minimize the effect of this phenomenon, the following analysis will work with averages over 10- and 50-year-periods. Another difficulty is caused by the fact that some of the city-states mentioned borrowed on behalf of their princely overlords. This was a common practice for Brugge and Ghent under the Burgundian rulers and was continued by their Habsburg successors. Also Antwerp became a large issuer of annuities to the benefit of Charles V, beginning in 1517.[153] Nevertheless, as long as the city in question retained control of the taxes that guaranteed repayment and maintained the obligation to repay the loans to the creditor, the interest rate is expected to be unchanged.[154] Finally, we should consider the influence of usury on interest rates and the depiction of its amount in the sources. Although the Christian condemnation of 'taking advantage of others' misfortunes' surely affected the quantity of information on borrowing that is obtainable from historical sources, it did not affect the rates used for this data stream substantially. Since annuities were based on the transfer of a certain amount of money in exchange for a regular payment, the transaction of annual interest could be defended as being a gift from a person that owes something to someone else rather than a payment. The quantity of evidence suggests that when the instrument of the annuity was invented and this obstacle was overcome, credit expanded rapidly.[155]

Examining this data stream and its information on interest rates suggests that Stasavage was also right about another aspect of the city-state advantage during the medieval period. It becomes clear that city-states were not just the first ones to invent systems of long-term borrowing, as section 2.4 showed, but that they were also capable of acquiring public debt against the most beneficial terms. The first city-state for which the sources offer evidence on interest payments, the Italian city-state of Venice, could raise revenues by paying between 8 and 10 percent interest from the 1290s to the 1320s.[156] Genoa paid interest between 6 and 10 percent, with an average of just below 9 percent during the fourteenth century.[157] In the following century, this rate declined to about 6 percent and eventually 3 percent.[158] The city-state of Florence, imitating the Venetian institution of forced loans, paid only 5 percent interest on its debt from as early as 1347 onwards.[159] Its government paid less than 3 percent interest at the end of the fifteenth century. At the same time, in strong contrast, European territorial rulers paid 15 to 30 percent interest on public borrowing.[160] The German king Henry of Luxembourg, in 1312-1313, borrowed on the rather costly term of 15 to 26.66 percent.[161] King Edward III owed a debt of £42,000 to the Florentine Bardi family as a result of several transactions between 1328 and 1331 and paid a 'gift' comparable with an

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[152] Because I work with 10- and 50-year averages in the further analysis, I have tried to minimize the influence of this phenomenon.
[153] Kohn, *Finance before the Industrial Revolution* (1999) 8.
[154] Stasavage, *States of Credit* (2011) 43.
[155] V.N. Bateman, *Markets and Growth in Early Modern Europe* (London 2012) 120.
[156] G. Luzatto, G., *Il Debito pubblico della Repubblica di Venezia; dagli ultimi decenni del XII secolo all fine del XV* (Milan 1963) 26.
[157] B.Z. Kedar, *Merchants in Crisis. Genoese and Venetian Men of Affairs and the Fourteenth Century Depression* (New Haven and London 1976) 98; J. Day, *Les Douanes de gênes 1376-1377* (Paris 1963) 25-26.
[158] L. Pezzolo, 'Economic policy, finance and war', in: S. R. Epstein (ed.) *State and Society in Italy, 1350–1550* (Oxford and Rhode Island 2001); Pezzolo, 'Republics and principalities in Italy' (2012) 280.
[159] Kohn, *Finance before the Industrial Revolution* (1999) 10; Pezzolo, 'Economic policy, finance and war (2001).
[160] This result changes nothing to the conclusions made by Epstein, *Freedom and Growth* (2000) 61.
[161] Fryde and Fryde, 'Public Credit' (1963) 512.

effective interest rate of 26 percent.[162] Two centuries later, the English kings were able to borrow at more beneficial terms but paid still no less than 13.5 to 18 percent.[163]

Relying on voluntary annuities, city-state governments in the Low Countries also paid considerably less than territorial rulers. Although more fragmented, evidence exists that the governments of Arras and Douai, two Flemish cities situated in contemporary France, issued long-term debts in 1241 and 1295 with interest rates of 15.5 and 9.1 percent respectively.[164] In Central Europe, Zurich began to sell redeemable perpetual annuities with an interest rate of 10 percent in the mid fourteenth century which declined to 5 percent by 1404.[165] This is comparable with what one paid for a perpetual annuity in Basel and Nuremberg and slightly higher than the rate of interest in Cologne and Mainz.[166] Overall, from the 1350s to the 1390s, central European governments paid about 7 percent of interest on long-term debt finance. All cities experienced a gradual decline, one somewhat slower than the other. The cities of Zurich, Dortmund and Nuremberg before 1400 give rather high averages, but this is mainly due to the fact that in these cases only evidence on issuance of life annuities has been provided.[167] In short, not only did city-states establish instruments of long-term debt earlier than territorial states, they could also borrow against considerably more beneficial terms. Moreover, the significant decline in interest rates during the Middle Ages suggests that, after the first markets emerged, a major development of the European public capital markets followed.[168] This is particularly true for the Italian, German and Swiss city-states, on which the database contains most information.

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[162] Fryde and Fryde, 'Public Credit' (1963) 455-456.

[163] Outhwaite, R.B., 'The Trails of Foreign Borrowing: The English Crown and the Antwerp Money Market in the Mid-Sixteenth Century', in: *Economic History Review* vol. 19 (1966) 302; Kellenbenz, H., 'Wirtschaft und Gesellschaft Europas 1350-1650', in: W. Fischer, J.A. van Houtte, H. Kellenbenz, I. Mieck and F. Vittinghoff (eds.), *Handbuch der Europäischen Wirtschafts- und Sozialgeschichte*, III (Stuttgart 1986) 113.

[164] P. Bougard, 'L'apogee de la ville', in: *Histoire d'Arras* (Dunkerque 1988) 61; G. Espinas, *Les Finances de la commune de Douai, des origines au XVe siecle* (Paris 1902) 314-346.

[165] Epstein, *Freedom and Growth* (2000) 21-24.

[166] Appendix A.

[167] As explained before, life annuities were often issued against higher interest rates.

[168] Bateman, *Markets and Growth in Early Modern Europe* (2012) 19.

# CHAPTER 3. 'THE LITTLE CONVERGENCE'

## 3.1 Introduction

This chapter provides a quantitative approach to the issues of market and economic performance. It argues that during the early modern period, European economies became more similar than might be expected from the Little Divergence theory. In making such a bold statement, it addresses two common measures of economic efficiency: creditworthiness and market integration. Regarding creditworthiness, it is generally assumed that creditworthy states which were able to issue debts with lower interest rates, reached a higher level of financial sophistication. Under this assumption, one might expect that during the period of the Little Divergence, from 1450 through 1800, interest rates show the same diverging pattern between northwest Europe and the rest of the continent as Allen's real wage estimates.[169] However, evidence on interest rates seems to show a clear contradiction with what the Little Divergence theory suggests. Considering the measure of market integration, evidence indicates that several developments of integration were taking place. This integration also concerned the regions that have been considered as less sophisticated, which once again contradicts the predictions of the Little Divergence theory. Finally, the evidence presented in this chapter seems to suggest that the city-state advantage, the difference between two types of public debt systems to which Stasavage has pointed, disappeared during the early modern period.

## 3.2 The Little Convergence: creditworthiness

In the Middle Ages, as the previous chapter has elaborated, several governments were acquainted with the practice of selling debt shares. When they appealed to the money reserves of wealthy merchants and bankers, they initially relied on floating debt. Since the twelfth and thirteenth century, however, city-states across the continent took a further step and created funded debt mechanisms, selling either forced loans or voluntary annuities for a long period of time. The primary reason why territorial states were particularly late in creating similar advantageous debt instruments, is that they simply could not find wealth holders prepared to lend such quantities of money over such a long period of time.

The reliance on long-term debt instruments became omnipresent throughout Europe during the early modern period. From the literature and qualitative evidence on the first issuance of long-term annuities (table 1) becomes clear that several territorial states across Europe learned how to create long-term loans soon after 1500. Evidence on interest payments shows that Ferdinand and Isabella of Castile were the first territorial rulers to sell long-term annuities, after its Financial Revolution in 1489, with an annual interest payment of 10 percent.[170] Only half a century later, the Spanish kings managed to sell perpetual annuities against a substantially lower rate of 6.25 percent.[171] Also the French kings increased their creditworthiness. Between 1415-1417 the French government had to promise the fairly high rate of 25 percent of interest on short-term loans to attract rich Parisian lenders.[172] In 1522, however, it was able to sell its first long-term loan with an interest rate of 8.33 percent.[173] In that same year, the States of

[169] Allen, 'The Great Divergence' (2001).
[170] Usher, *The Early History of Deposit Banking in Mediterranean Europe* (Cambridge 1943) 174.
[171] A.F. Ruiz-Martin, 'Cedito y banca, comercio y transportes en la epoca del capitalism mercantile', in: *Actas de las I jornadas de metodologica aplicada a las ciencias historicas* III (Santiago de Compostela 1975) 14.
[172] Fryde and Fryde, 'Public Credit' (1963) 483.
[173] Homer and Sylla, *A History of Interest Rates* (2005) 116, 120, 129, 167-169 and 170.

Holland also began to apply the practice of selling long-term debt shares. We know from Tracy's account on the Dutch Financial Revolution that, in order to reach this level of creditworthiness, the Dutch government had developed the necessary mechanisms and information networks.[174] From Zuiderduijn's account, it appears that the Dutch territorial government actually build upon practices that had been well-known on municipal level for centuries.[175] As a result, the Dutch paid an interest rate of 6.25 percent.[176] A qualitative analysis on the emergence of public debt mechanisms (table 1) shows that, at the beginning of an age of increasing warfare, a lot of sixteenth-century states sieged bond markets and sold long-term debt shares to obtain large sums of money.[177] This implies that, in order to achieve access to the beneficial form of long-term debt finance, almost all early modern European states had made the necessary institutional improvements to increase their borrowers' trust. Equally important, the previous examples show that the French and Spanish kings as well as the Dutch government began to pay considerably less interest on their debts as soon as they applied such systems. This lower rate of interest indicates that these states adopted institutions that guaranteed and fostered trust and regularity. If creditworthiness is employed as a measure for economic sophistication, both developments indicate that territorial states were becoming economically more advanced during the early modern period. This raises the question how different European states and regions developed their creditworthiness in comparative perspective. The quantitative measure for economic efficiency applied here, the interest rate, enables a comparative analysis.

The development of European interest rates between 1400 and 1800 shows an obvious but surprising pattern. Figure 3 presents a complete picture of the sample of states, containing all the data that secondary sources have provided on costs of governmental borrowing. Although secondary sources also provide evidence on private and municipal borrowing, only interest rates on governmental borrowing are included in the analysis to improve the reliability of interstate and interregional comparisons.[178] The rates mentioned in the figure thus exclusively reflect levels of state governments' creditworthiness. In order to smooth out temporary economic, political or market effects and depict a well-balanced picture of the costs at which a state could borrow, the figure presents average interest rates over 50-year periods. For the central European and Italian regions, the figure depicts an average rate for both the city-states and territorial states in order to increase the figure's clarity. How these average rates have been constructed, can be understood from Appendix A. Firstly, the figure confirms that several territorial states increased their economic efficiency substantially around 1500, but also shows how common this trend was throughout the European continent. Most territorial rulers achieved a reduction in interest payments to less than 6.5 percent only a century after they established mechanisms of long-term debt. Charles I of Castile, for instance, was able to borrow against an annual interest payment of less than 6 percent by 1550.[179] The French and Dutch territorial governments paid an average of 6 percent between

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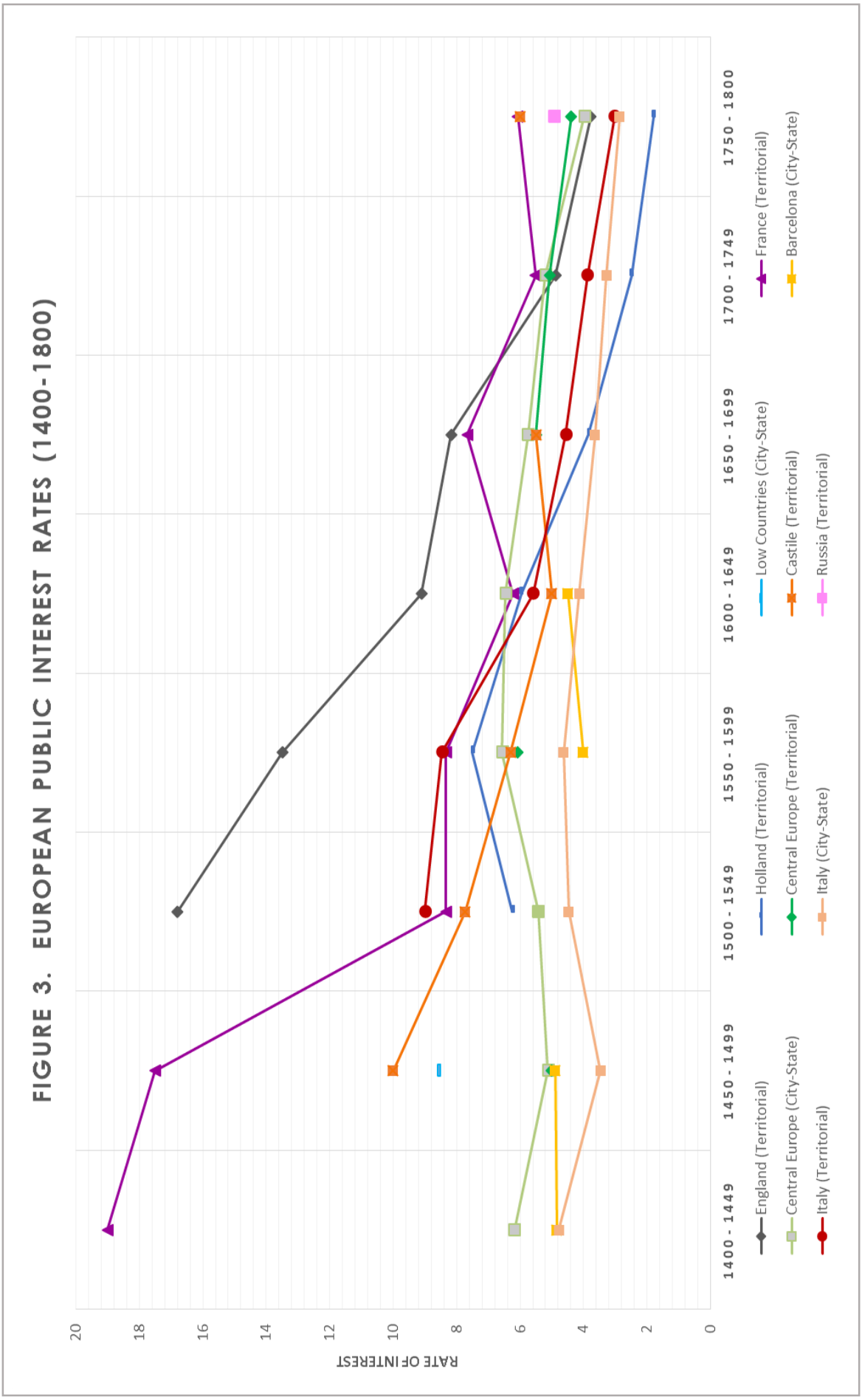
[174] Tracy, *A Financial Revolution in the Habsburg Netherlands* (1985).
[175] Zuiderduijn, *Medieval Capital Markets* (2007) 186.
[176] Tracy, *A Financial Revolution in the Habsburg Netherlands* (1985) 94.
[177] Stasavage, *States of Credit* (2011) 46; Because we have no evidence of the existence of long-term debts on Russia and Poland before the eighteenth century, I did not reckon these states in making this statement.
[178] Although these municipal debt shares are not included into the analysis, my database certainly contains information on them.
[179] Usher, *The Early History of Deposit Banking* (1943) 175; F. Mauro and G. Parker, 'Spain', in: D. Wilson and G. Parker (eds.), *An Introduction to the Sources of European Economic History 1500 - 1800* (London 1977) 49; Ruiz-Martin, 'Cedito y banca' (1975) 14.




*Sources:* Appendices A and C.

1600 and 1650. This performance was equalled by the Italian monarchies, paying 5.6 percent during the same period (average of Bologna, Milan, Naples, Papal States, Piedmont and Tuscany). According to this evidence, it is certainly not incorrect to assume that territorial rulers were rather credible and their institutions relatively modern long before 1800.

Secondly, figure 3 shows that while territorial states jointly improved their creditworthiness, European interest rates clearly converged with each other. This phenomenon, from this point on referred to as the 'Little Convergence', reached its zenith in the eighteenth century and concerned all European states and regions under examination. Considering just the states with a functioning system of long-term debt, thus not taking the English, Polish and Russian systems into account, interest rates throughout Europe became very similar as soon as the period between 1600 and 1650. As a result of this Little Convergence, an extreme margin of almost 20 percent between different European regions in the beginning of the fourteenth century was reduced to less than 2.5 percent by mid seventeenth century.[180] If we consider all states individually rather than regionally, thus not examining the Italian and central European city-states as averages, the extreme margin between different states amounted to about 4 percent with rates between 3.28 and 7.65 percent.[181] Strikingly, this absolute difference of 4 percent remained the margin for all states but England until 1800.[182] During the eighteenth century, soon after England's Glorious Revolution, English interest rates converged to a European average. Moreover, for the period 1750-1800, data has been found on Poland, Tsarist Russia and Bourbon Spain. Interest rates in these 'backward' states amounted 5 and 6 percent respectively, only 1 to 2 percent above the European average, which means that they were rather quite creditworthy. As the absolute margin between all states as well as the different European regions did not change considerably after 1650 (excluding the extraordinary trajectory of England), European interest rates still declined within all regions except for France, indicating a major economic development across Europe. The European average declined from 6 percent in 1600-1650 to 4 percent in 1750-1800, even if the comparatively high interest rates of Poland, Bourbon Spain and Russia are included in the analysis.[183]

Assuming that creditworthiness reflects a high degree of economic efficiency, these findings enable us to put the Little Divergence theory to the test. Let us take a closer look at the region that its theorists claim to be the most sophisticated: northwest Europe. Regarding the countries situated around the North Sea, the analysis includes information on both territorial Holland and England. Figure 3 shows that the Dutch reached a high level of creditworthiness from the mid seventeenth century onwards. Comparatively low interest rates demonstrate that Holland achieved a relatively high level of institutional efficiency which, following the theory, would eventually translate into better economic performance. The results for England, however, tell a completely different story as they do not show the same economic distinctiveness as would be expected from Allen's wage estimates and the Little Divergence theory. Although wage rates suggest that both England and the Low Countries distinguished from other parts of Europe since the 1450s, evidence on interest rates shows that England, over the same period, had great difficulties to catch up with the rest of Europe. Before the eighteenth century, England was lagging behind other European economies rather than leading them. The substantial margin

[180] Appendix A; average of Italian city-states versus England; 1600-1650: average of Italian city-states versus Italian territorial states.
[181] *Ibidem;* Considering Genoa and Geneva.
[182] *Ibidem,*
[183] *Ibidem;* Averages of overall sample.

between Dutch and English interest rates, that persisted until the eighteenth century and was reduced to 2 percent by then, indicates that large structural macro-economic differences prevailed during the most part of the early modern period. Moreover, interest rates suggest that from about 1450 onwards, both economies did not evolve in accordance with each other as the Little Divergence theory suggests. From the institutionalists' point of view, it would anyhow be rather dubious that England and the Low Countries achieved comparable levels of economic performance from 1450 onwards, because of the considerable macro-economic differences that existed at the time. England was a resource rich and mainly agricultural economy with possibly as much as 60 to 70 percent of its population engaging in agriculture. It was a typical example of a strong feudal state with relatively weak cities, both for institutional reasons and its low level of urbanization.[184] The Dutch economy, in strong contrast, was dominated by export, industry, international trade and services. In the 1510s, an estimated 25 percent of the Dutch population was participating in agricultural activities, another 15 percent fished or dug for peat. 20 to 25 percent was active in services (trade and transport) and an astonishing 38 percent occupied in industry.[185] Moreover, the Netherlands were heavily urbanized what also led that its cities acquired a high degree of control while the nobility was relatively weak.[186] It appears that Allen's wage evidence does not coincide with both evidence on public interest rates and macro-economic analyses of the northwest European region at the beginning of the early modern period.

Evidence on interest rates therefore suggests that the states' creditworthiness markedly converged between 1450 and 1800. Assuming that economic sophistication is reflected in the efficiency of financial institutions, interest rates show that European economies became increasingly similar during the early modern period. A general decline of European interest rates suggests that institutional improvements continued to occur until the end of the period. In light of the Little Divergence, however, one had probably expected to see interest rates diverge between northwest Europe and the rest of the continent in the period 1450-1800 as wage rates did. The evidence on interest rates show exactly the opposite of what the Little Divergence theory suggests. While European interest rates differed considerably in the medieval period, the margin between different regions was reduced during the early modern period.

### 3.3 The Little Convergence: market integration

Interest rates can also be employed as quantitative evidence for the second measure of economic sophistication that this paper addresses: the appearance of market integration in European regions. The supposed existence of a relation between market integration and economic sophistication is based on the insight that extension of commercial networks leads to converging prices that, in turn, develop strong and stable trade relationships. Market integration therefore allows conclusions on the development of trade and therefore economic sophistication within a certain territory. One would expect that the most sophisticated economies of Europe showed a high degree of market integration. Zuiderduijn, for instance, recently wrote a qualitative account on financial market integration on local level and argued that the Low Countries witnessed a gradual integration of municipal public markets for debt shares during the late medieval period.[187] The Holland public sector expanded its field of operation to cities and

[184] Van Zanden, *The Long Road to the Industrial Revolution* (2009) 98-99.
[185] J.L. van Zanden, 'Taking the measure of the early modern economy. Historical national accounts for Holland in 1510/14', *European Review of Economic History* 6 (2002) 131-165
[186] Van Zanden, *The Long Road to the Industrial Revolution* (2009) 99.
[187] Zuiderduijn, *Medieval Capital Markets* (2007) 186.

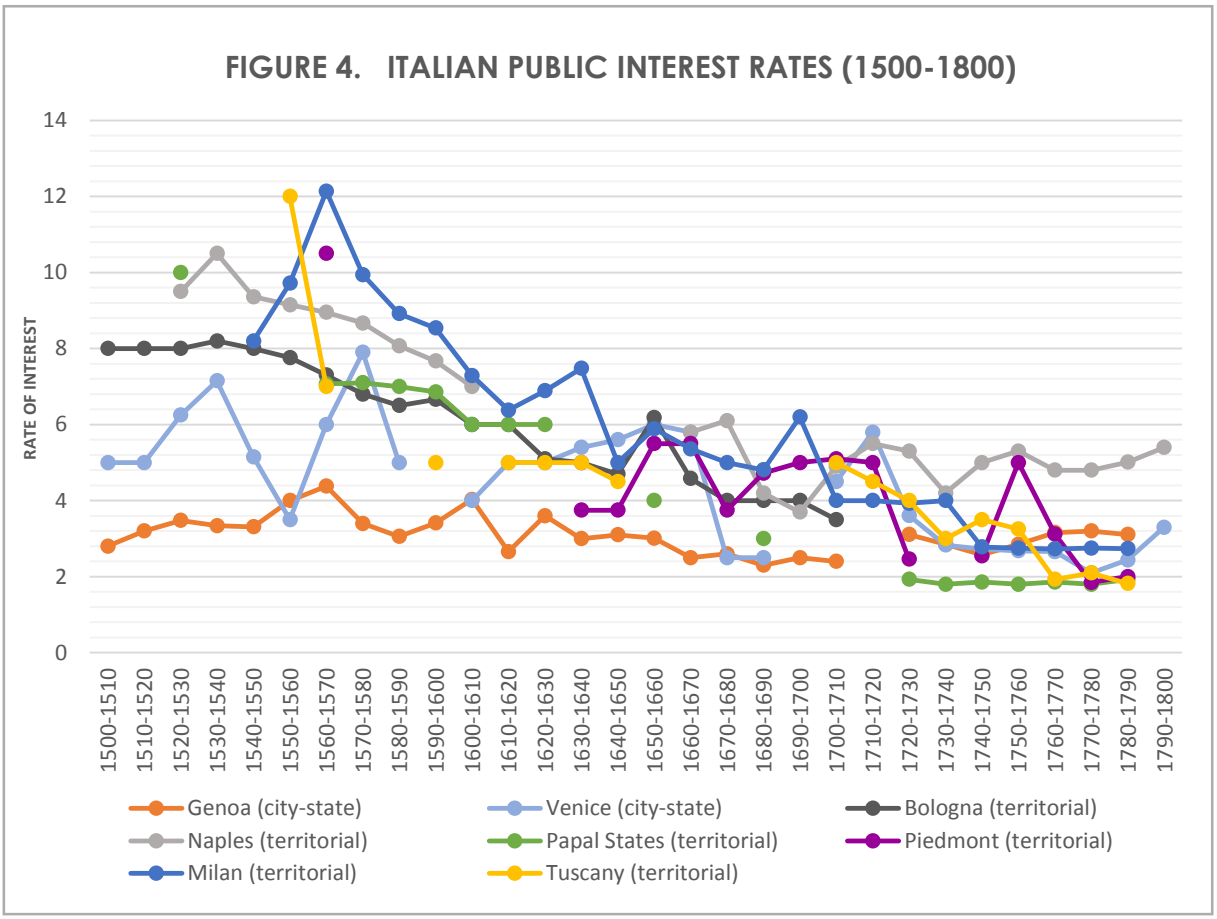
smaller towns in neighbouring provinces. Moreover, although the Dutch and English economies varied considerably at the beginning of the early modern period, Larry Neal provided evidence for the particular integration of Dutch and English stock markets during the eighteenth century. In addressing high levels of integration, these authors delivered evidence for a degree of economic sophistication in the North Sea Area: in order to eliminate constraints and advance market integration, the Netherlands and England had to develop the right market structures and institutions.

In light of the Little Divergence debate, this account raises the question to what extent other European regions achieved market integration on interstate or regional level. In order to make some profound argument on this, the interest series will again be applied. A high convergence of prices is an indicator for a developed market system and vice versa. Following the Little Divergence theory in assuming that northwest Europe reached considerable higher levels of economic sophistication than the rest of the continent, one might expect that other regions of the continent achieved low levels of market integration. The large quantity of available data on governmental borrowing within the Italian region, with which long time series of interest rates can be constructed, makes this region a very appropriate candidate to test such a hypothesis. Regarding early modern Italy, the database contain series for the city-states of Genoa and Venice and the territorial states of Bologna, Milan, Naples, the Papal States, Piedmont and Tuscany, with which an almost complete and profound picture can be constructed. The city-state of Florence is absent in this analysis because it was absorbed by the Duchy of Florence in the 1530s and later the Grand Duchy of Tuscany in the 1560s. Figure 4 shows 10-year averages of the Italian interest rates from 1500 to 1800. The figure shows that Venetian rates swung heavily with a margin of 4 percent, between limits of 4 and 8 percent in the sixteenth century and 2 and 6 percent in the seventeenth and eighteenth century. Until 1700, its counterpart Genoa proved to possess by far the most stable and successful public debt system. The Genovese government was able to sell government bonds by paying a rate of 2.5 percent on interest. While amounting to 6 to 8 percent between the 1560s and 1620s, interest rates in the Papal States generally declined and took over pole position after 1700. Interest rates in Bologna, Milan and Tuscany also experienced such a general decline over time. The interest series in figure 4 show how analogous this pattern was. Although interest rates in Piedmont fluctuated more heavily, interest payments remained well between a margin of 2 and 6 percent. Taking stock of the situation, all states but Naples paid an interest below 4 percent during the eighteenth century. While they began at highly diverging levels at the beginning of the sixteenth century, interest rates in different Italian regions markedly converged between 1500 and 1800. In short, figure 4 seems to suggest that the Italian region experienced a process of market integration. Interest rate levels were remarkably similar, especially during the eighteenth century, what suggests that a considerable level of financial integration was achieved.[188]

In striving to construct more figures that capture similar processes of financial integration, based on the measure of interest rates, it is considerably more difficult to make similar arguments regarding other European regions. This is mainly due to the lack of data on other regions. For both Spain and Central Europe, knowledge on interest rates is insufficient to construct a picture that is comparable with the Italian example. Although the dataset contains information on these regions, it is periodically and/or geographically too fragmented to construct interest series addressing several places over a longer period between 1500 and 1800. This does not imply that the data prevents us from discovering anything at all.

[188] Reasons for the variance are offered by Pezzolo, 'Republics and principalities in Italy' (2012).

Firstly, for Spain the analysis includes interest rates from Castile and Barcelona. Figure 3 shows that the substantial margin that existed between Castile and Barcelona during the fifteenth century was reduced to an average of 0.5 percent in the period 1600-1650. This information provides evidence to draw some conclusions about a convergence of creditworthiness between the two states but obviously does not allow us to make any profound arguments about market integration in the region.

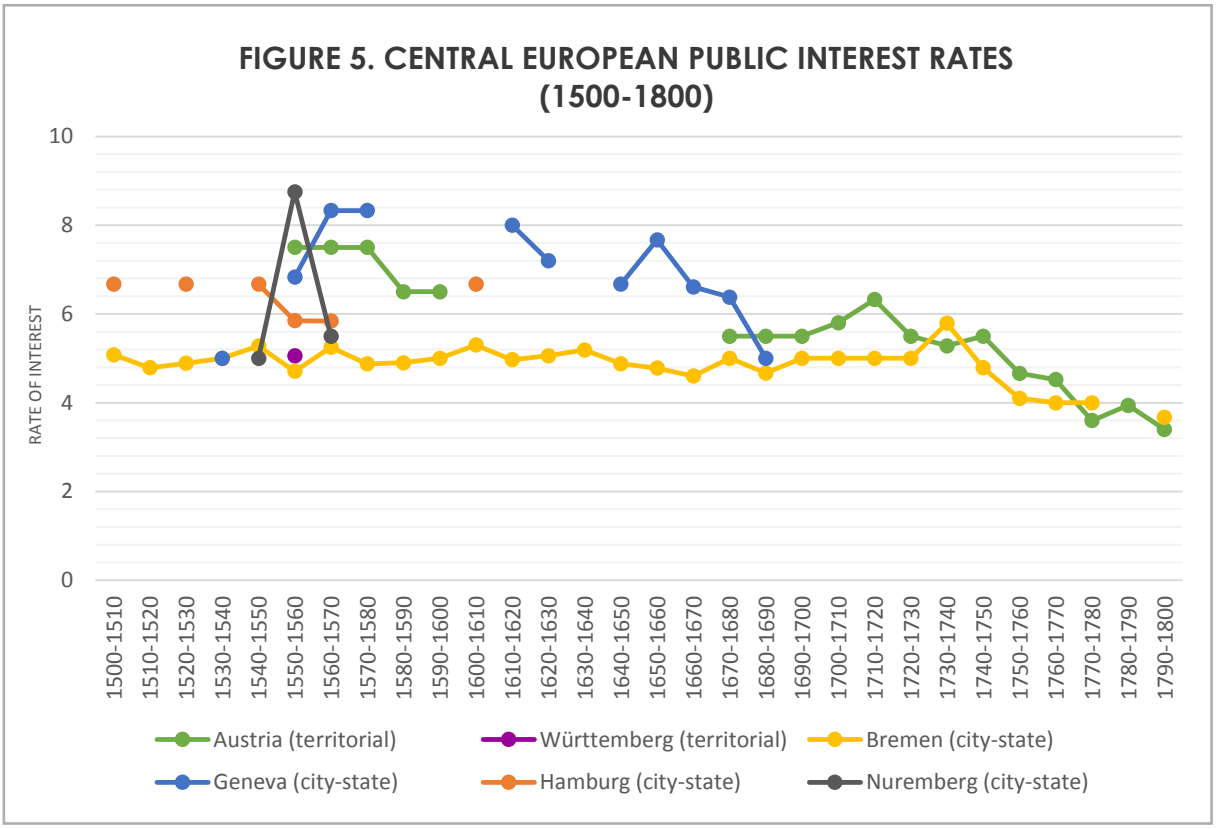



*Sources:* Appendices B and C.

An analysis of Central Europe proves to be more fruitful because evidence on interest rates can be combined with previous research that concerns financial market integration in this area. A lot of work has been done on the late medieval period. Studies from Oliver Volckart, Lars Boerner and David Chilosi provided evidence that monetary markets in central Europe became more integrated during the fifteenth century, though in most cases focussing on the quantitative measure of exchange rates.[189] The collected data, however, enables the construction of information on the financial integration during the early modern period while focussing on interest rates. Figure 5 shows 10-year averages of central European interest rates between 1500 and 1800. Considering the sixteenth century, it seems that interest rates in Bremen and Hamburg remained quite stable, swinging lightly around 5 and 6.5 percent respectively. Interest rates in Nuremberg and Württemberg were quite similar to those in Bremen. The relatively high rate in Nuremberg during the 1550s was caused by the fact that the city only sold life annuities during

[189] Chilosi and Volckart, 'Money, States, and Empire' (2011) 784; Boerner and Volckart, 'The Utility of a Comman Coinage' (2011) 53-65; O. Volckart, 'Rules, Discretion or Reputation? Monetary Policies and the Efficiency of Financial Markets in Germany, 14th to 16th Centuries', *SFB 649 Discussion Paper Series* 7 (2007) 1-37.

this decade while the other rates concern perpetual annuities.[190] Remarkably, from the little data that we have on the sixteenth century we can conclude that differences seemed to be relatively small as early as the sixteenth century. Considering the seventeenth and eighteenth century, sources provide enough data to construct more complete series over a longer period of time for Geneva, Austria and Bremen. This allows the recognition of some patterns. Interest rates seem to make a converging movement towards the eighteenth century, in which differences between states largely disappeared. The relatively small quantity of data suggests that a process of convergence and therefore financial integration was




*Sources:* Appendices B and C.

taking place. This presumption gains more weight if it is combined with other accounts on monetary integration in Central Europe. Among others, Markus Denzel made similar arguments about financial traffic in his qualitative account on seventeenth and eighteenth-century money exchanges.[191] Denzel argued that Central Europe experienced a conversion from "connection to integration" during these centuries.[192]

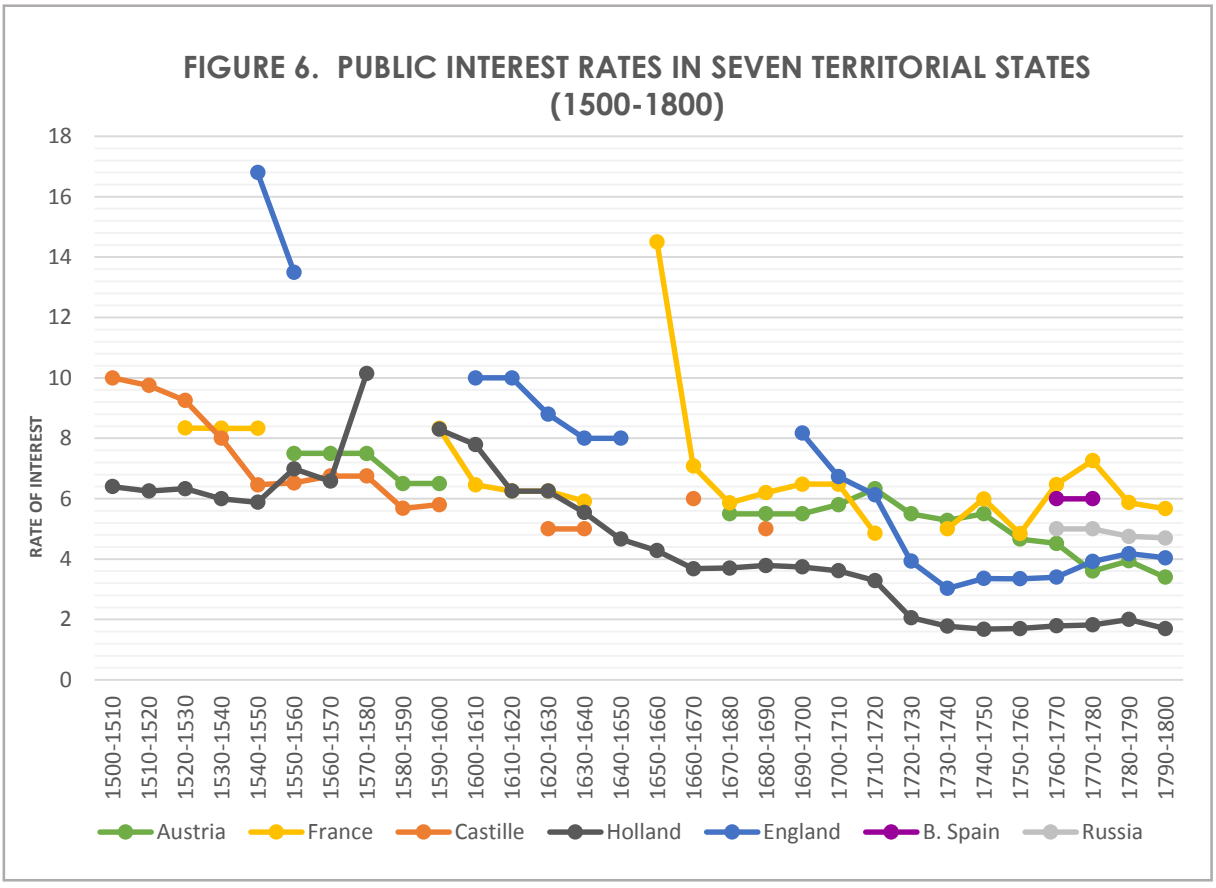
Following the predictions of the Little Divergence theory, one might expect that different regions of Europe, such as Italy and central Europe, show low levels of market integration during the early modern period. The evidence on interest rates that this section has presented, however, seems to move contrary to the predictions of the Little Divergence theory once again.

[190] Fryde and Fryde, 'Public Credit' (1963) 548.
[191] Denzel, 'Die Integration Deutschlands' (1996) 58-109.
[192] *Ibidem,* 75; this qualitative research also incorporated the city-states of Hamburg, Cologne, Nuremberg and Bremen, and the territorial city of Vienna.

### 3.4 The Little Convergence: the city-state advantage

As governments became similarly creditworthy, and market integration affected several regions across the continent, economies had more and more in common with each other. However, as was elaborated in chapter two, Stasavage has emphasized two distinct types of states regarding the manner they handled their debts. He argued that not only did city-states create public debt mechanisms considerably earlier than territorial states but also that they paid considerably lower interest rates.[193] The evidence presented in chapter two suggests that Stasavage was right about the timing of public debt systems, though new data enabled this paper to make considerable improvements (table 1). However, the results show that Stasavage was wrong in arguing that "there is little evidence of a swift convergence in interest rates between these two types of states" and that the city-state advantage of lower interest rates prevailed for a long period.[194] During the early modern period, the efficiency of these two types of debt systems began to resemble each other. Although differences were substantial during the Middle Ages, the margin between both systems began to disappear after 1500 as their interest rates experienced a convergence that became very noticeable between 1600 and 1650 and was maintained until 1800.

The convergence of interest rates throughout Europe, pictured in figure 3, already suggested that interest rates in territorial states experienced a rapid decline after the first issuances of long-term debt. Yet, more detailed information on interest rates allows a description of this notable development in more detail. Figure 6 provides 10-year averages of interest rates between 1500 and 1800. Because of their geographic dispersion across European regions and because of the sizeable quantity of information on




*Sources:* Appendices B and C.

[193] Stasavage, *States of Credit* (2011) 47-93.
[194] *Ibidem,* 46.

interest rates, Castile, England, France, Holland and Austria are incorporated in the figure. Information on eighteenth-century Tsarist Russia and the Kingdom of Poland puts the achievements of European territorial states in broader perspective. Hence, the figure allows us to address general developments and notice similarities between territorial states. In the beginning of the period, interest rates in all territorial states were between 6 and 10 percent (with the exception of England that still relied on short-term debt shares). The further development of interest rates, a general decline towards the eighteenth century, proves to be remarkably similar too. In the eighteenth century, interest rates were between 2 and 6 percent (including England), staying within the absolute margin of roughly 4 percent since the seventeenth century (with the exception of France in the 1650s).[195] Hence, firstly, figure 6 confirms an argument that was made before. Territorial states across Europe experienced a highly comparable decline of interest rates, regardless of which region they were part of. Secondly, the figure shows the general speed at which territorial interest decreased. While territorial states adopted institutions that guaranteed trust and fostered regularity, their interest rates declined with averagely 4 percent.

While pointing to the remarkable decline of interest rates on English public debt after the Glorious Revolution, scholars have often emphasized that eighteenth-century England achieved extraordinary economic efficiency.[196] Although improvements of its economic structure certainly caused interest rates to decrease, the English achievements have to be considered in broader European perspective. Figure 6 allows us to account for such a comparative analysis. England was particularly late in creating instruments for long-term debt finance and paid a remarkable risk premium until it finally caught up with the rest of Europe in the 1690s. Evidently, until then its institutions were underdeveloped and its kings still had to rely on short-term loans. A very probable explanation for this institutional delay, often posed by historians, is that the country's long political and military isolation shielded the English monarchy from what was already argued to be the main stimulus for fiscal and financial change: war.[197] After the events of the Glorious Revolution and improvements in its economic structure, however, English interest on debt finance declined enormously to 3 percent in the 1730s, reaching a rate just below the European average in less than fifty years.[198] In this respect, however, the achievements of other European states are as admirable. During the eighteenth century, the Austrian monarchy assured its investors to be a reasonably secure investment. From the 1770s onwards, the Austrian emperors paid even less interest on their debts than the English kings. France initially developed its fiscal system in line with the European pattern, although it could borrow against less beneficial terms than its English rival and it had great problems in securing its credibility during the eighteenth century. It issued its first long-term debt in 1522 and paid 8 percent interest in the early seventeenth century.[199] Especially after 1750, the monarchy had great difficulty in overcoming institutional obstacles for the collection of taxes, being a permanent default risk.[200] The French economic and fiscal problems are visible in its relative high rate of interest. At the end of the period, although French commitment mechanism did not reach the same

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[195] R. Bonney, *The King's Debt: Finance and Politics in France 1589-1661* (Oxford 1981).
[196] North and Weingast, 'Constitutions and commitment' (1989).
[197] Epstein, *Freedom and Growth* (2000) 25.
[198] Homer and Sylla, *A History of Interest Rates* (2005) 129 and 153-160; Dickson, *The Financial Revolution in England* (1967) 60-61 and 63; H. van der Wee, 'Money, Credit ad Banking Systems', in: *The Cambridge Economic History of Europe* V (Cambridge 1977) 388.
[199] Homer and Sylla, *A History of Interest Rates* (2005).
[200] F.R. Velde and D.R. Weir, 'The Financial Market and Government Debt Policy in France 1746-1793', *The Journal of Economic History* 52-1 (1992) 1-39.

credibility level as the English market (a difference of 1.63 percent), English interest rates slightly increased from 1750 to 1800 so that it reached a creditworthiness comparable with the empires of Austria and Russia. Moreover, relatively 'backward' states as Poland and Bourbon Spain achieved comparable rates of creditworthiness that did not differ very much by that time, certainly not from France, amounting between 4 and 6 percent.[201] The Dutch economy developed itself into an absolute European leader as its structure proved to be the most successful and creditworthy from the seventeenth century onwards. By the eighteenth century, "Amsterdam was the dominant international capital market [...], supplying loans to all major states in Europe, and to many small ones as well."[202]

By the sixteenth century, territorial states had improved the credibility and efficiency of their economic and financial institutions to such extent, that interest rates were around 6 percent. As chapter two has suggested, this amount of interest was not uncommon for several European city-states. Between 1600 and 1650, the German city-states of Bremen and Hamburg paid an interest of 5 and 7 percent respectively on their debt shares. The Venetian and Barcelonan governments paid 5 and 4.5 percent interest during the same period, while interest payments in Geneva amounted to almost 8 percent. These figures raise the question to what extent the city-state advantage, to which Stasavage and others recently pointed, still existed during the early modern period. To reach a profound conclusion on this, the average interest rates of the overall samples of city-states and territorial states are compared. Figure 7 shows the development of these averages between 1400 and 1800, following Stasavage's categorization of territorial and city-states. All thirteen city-states and sixteen territorial states, on which the dataset contains information for this particular period, are included. In order to smooth out temporary effects of individual states and to depict a reliable picture of the average costs at which a type of state could borrow, the figure presents average interest rates over 50-year periods. At the beginning of the period, the city-state advantage was substantial, depicted by the margin of 7 percent between the two different types of states. However, in the second half of the sixteenth century, when all territorial states but England applied systems of long-term debt finance, this margin was reduced to less than 3 percent. Next, between 1600 and 1650, the city-state advantage had largely disappeared (0.63 percent). The margin proved to remain close to nothing during both the seventeenth and eighteenth century (1650-1700: 0.62 percent; 1700-1750: 0.43 percent; 1750-1800: 0.77 percent). From the seventeenth century onwards, as elaborated before, the absolute margin within the sample of states remained largely the same (with the particular exemption of England), although European interest rates still experienced a major decline during the seventeenth and eighteenth century. States continued to develop towards the end of the early modern period. Figure 7 includes this process, but also shows that it did not affect the difference between city-states and territorial states. After territorial states caught up with city-states quite abruptly between 1600 and 1650, both systems gradually developed parallel to each other.

During the early modern period, European territorial states were able to achieve comparable levels of creditworthiness and economic efficiency as their small city-states counterparts. The differences between the two public debt systems that Stasavage and others have emphasized, ceased to exist. In contrast to what several historians have suggested, the data on the development of interest rates on public

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[201] J.C. Riley, *International Government Finance and the Amsterdam Capital Market 1740-1815* (Cambridge 1980) 49, 111, 139 and 165; Fynn-Paul, 'The Evolution of Eighteenth-Century Investment Capitalism from an Investor's Point of View' (currently under review by journals).

[202] Van Zanden, *The Long Road to the Industrial Revolution* (2009) 222-223; Fynn-Paul, 'The Evolution of Eighteenth-Century Investment Capitalism from an Investor's Point of View' (currently under review by journals) 26.

debt does offer conclusive evidence that the monarchies' agency problems were largely solved by the eighteenth century. These conclusions remain convincing if the Netherlands, Württemberg and England (after 1688), three territorial states with strong representative assemblies, were kept out of the comparative analysis. Although Stasavage did not account for this variation in his own work, these countries have histories of strong representative assemblies which could have influenced the pattern that is visible in figure 7. However, also in this case, a convergence of both types of debt systems during the early modern period remains evident.

Figure 8 pictures a similar comparison between city-states and territorial states but considers the central European region more specifically. Here, we see that territorial governments were particularly successful securing credibility during the whole early modern period. The exceptional low rate of 5 percent in 1450-1500 was achieved by Saxony and concerns a loan from the bishop of Meissen to the prince of Saxony.[203] The exact character of this loan is not completely clear, although its low rate makes it highly probable that it concerns a long-term debt share. As can be seen from figure 8, an annual interest rate of 5 percent was less than that the average central European city-state had to pay in order to get access to the capital market.[204] Regarding the following century, there is evidence on other territorial entities achieving relatively cheap access to borrowing activities. In the period 1550-1600, Württemberg and Austria paid on average 5.06 and 7.13 percent respectively, similar to the central European city-state average.[205] It seems that the difference between the two types of debt systems had already disappeared by this time. Yet, one could put this argument into question because of the somewhat limited quantity of data on central European territorial states until the seventeenth century. Nevertheless, from 1650 onwards the quantity of data on interest rates increases and shows that the territorial average was still below the city-state average. During the seventeenth as well as the eighteenth century the average of Danish and Austrian rates continued to be similar to the average of the city-state of Bremen. For that reason, it seems that the credibility and economic efficiency of territorial states in this region was rather competitive in relation to their city-state counterparts. A similar evolution can be observed in Italy. Figure 3 shows that averages of Italian territorial and city-states also converged towards the eighteenth century, although a full convergence was only completed at the very end of that century. It took Italy one and a half century more to eliminate this difference. However, figure 4 shows that this delay was mainly caused by the effect that the relatively high rate of the Kingdom of Naples had on the territorial Italian average. Leaving Naples out of examination, territorial states would have converged even earlier with city-states.

These results show that the city-state advantage disappeared during the early modern period, although we have to account for regional differences. This implies that European states did not only reach comparable levels of creditworthiness and experienced processes of market integration. It also implies that the city-state advantage, an obvious and remarkable divergence that existed throughout medieval Europe between two types of debt systems, became less noticeable between 1600 and 1650.

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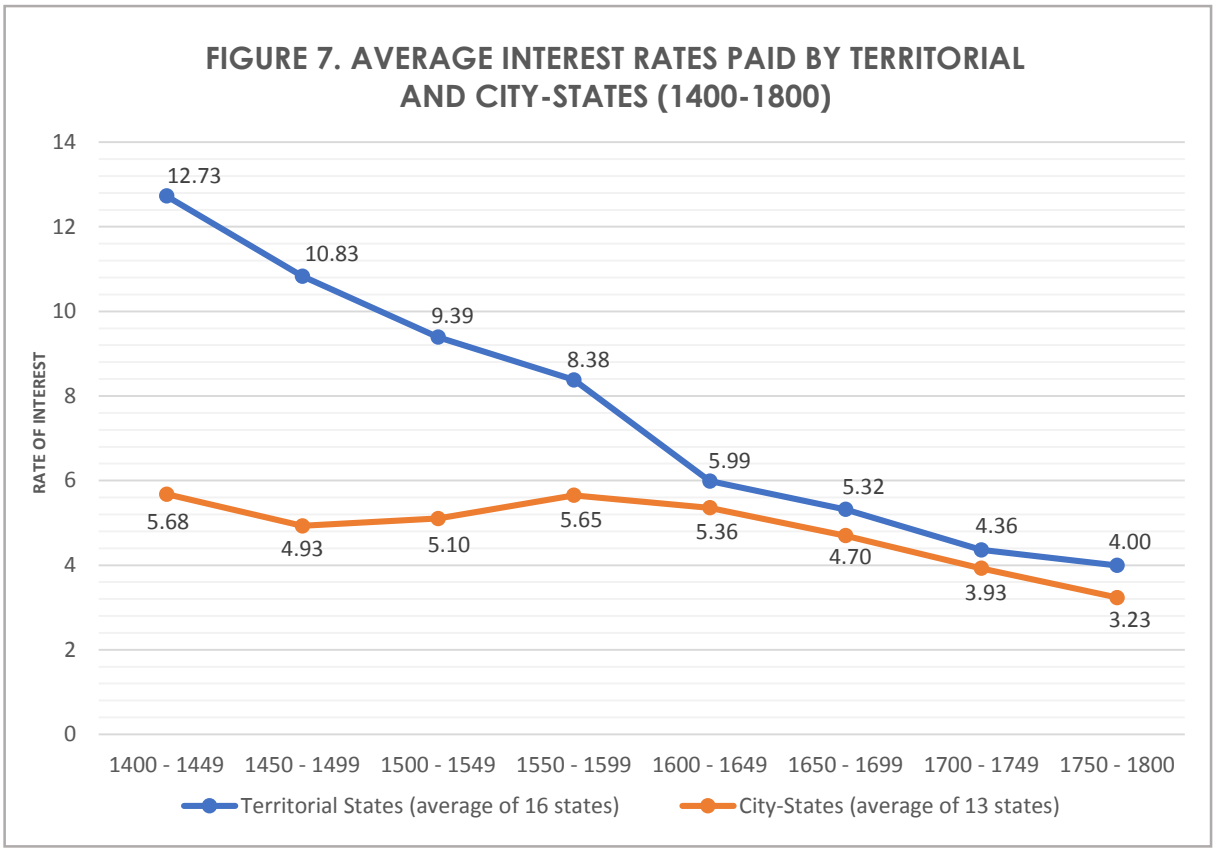
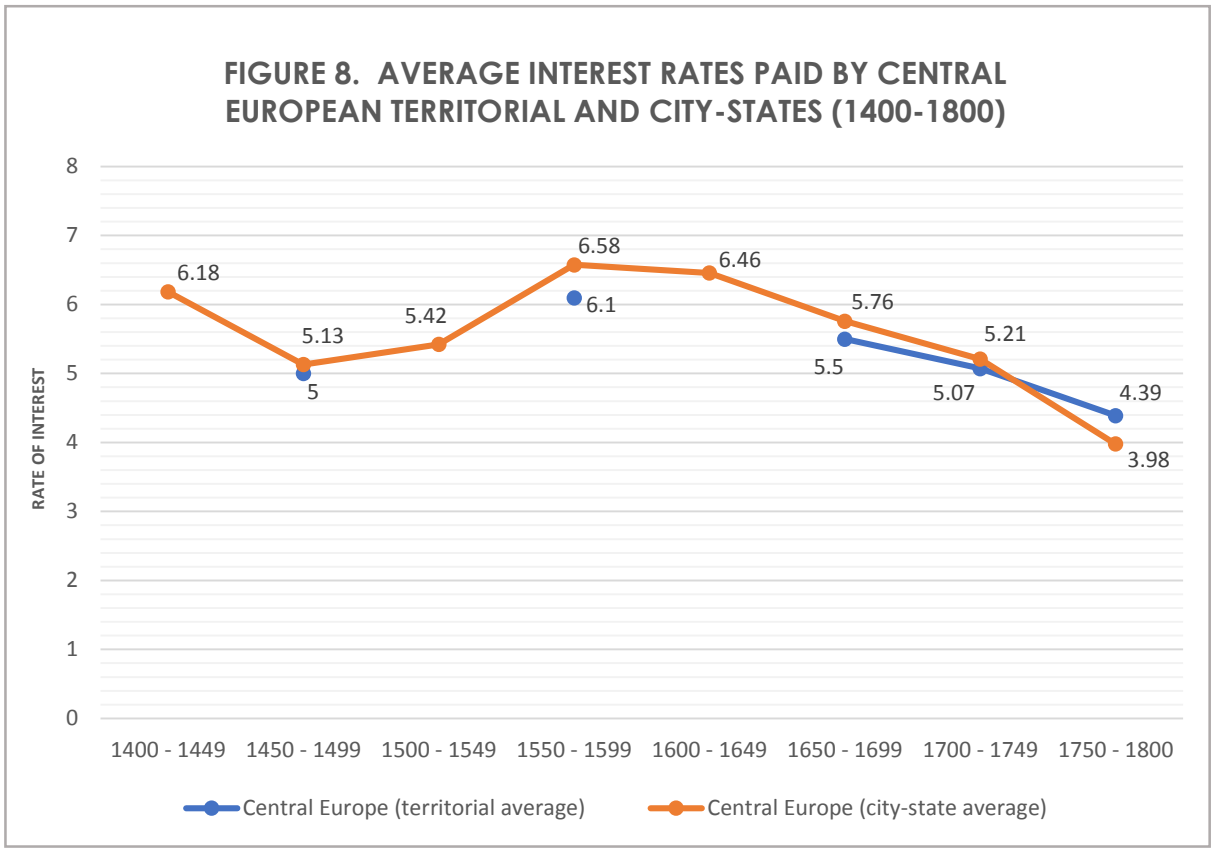
[203] Fryde and Fryde, 'Public Credit' (1963) 523.

[204] See footnote 143 why Saxony was included into the dataset.

[205] Tracy, *A Financial Revolution in the Habsburg Netherlands* (1985) 19. This exceptional low rate at such an early date has probably been affected by Württemberg's influential representative assembly. Nevertheless, even taking this influence into account, the risk premium that the Emperor of Austria had to pay to persuade his lenders, in comparison to city-state governments, was just 0.65 percent.




*Sources:* Appendices A and C.




*Sources:* Appendices A and C.

# CHAPTER 4. THE FINANCIAL INTEGRATION OF EARLY MODERN EUROPE

## 4.1 Introduction

This chapter addresses the integration of public debt mechanisms in more detail. It is argued that, despite considerable differences in government types, countries throughout Europe by the seventeenth and eighteenth century were learning how to create effective public debt systems whose interest rates did not markedly differ from those of the most sophisticated European economies (the Netherlands and England). Therefore, this chapter argues that the Little Convergence has mainly been driven by an increasing resemblance of fiscal and technical practices. The marked convergence of interest rates seems to suggest that European economies were integrating throughout the whole continent. Unfortunately, the character of public interest rates makes the data inappropriate for a profound statistical analysis on exact levels of market integration. Nevertheless, statistics does enable us to trace the similarity of trajectories in which European public debt systems developed. This chapter shows that public debt mechanisms did not only ended up in great similarity in the eighteenth century, but that their different trajectories were considerably similar too. Because interest rates reached a notable level of convergence as early as the seventeenth century and because financial instruments developed in great similarity with each other throughout the whole continent (coefficients showing a high correlation between very distant economies for which there is no indication that they were actually integrated), this chapter suggests that it is improbable that the Little Convergence was in principal caused by direct market integration (that is the actual exchange of public debt shares). Therefore, it is argued that European countries were somehow effectively adopting the most sophisticated financial models available to their own local situations. This resulted in the Little Convergence of interest rates, which, consequently, helped to integrate the economies of Europe at a time when the Little Divergence was supposed to have been separating them.

## 4.2 Constitutional or technical convergence?

The quantitative evidence on interest rates, presented in the previous chapter, seems to suggest that public debt markets across Europe became notably more integrated from the seventeenth century onwards. As soon as large territorial states created systems of long-term debt finance, their creditworthiness improved markedly, pictured by a general decline of interest rates. Moreover, the difference between territorial and city-states disappeared. This urged interest rates throughout the European continent to converge. Furthermore, during the early modern period, as public debt mechanisms improved their creditworthiness, their performances also began to resemble each other. This institutional integration needs a further classification. This section addresses possible explanatory factors for the fact that interest rates converged all across Europe.

The appearance of the Little Convergence can be explained by two possible factors since a state's institutional framework influences the debt market in two possible ways. These explanations are derived from historical accounts that have investigated public interest rates and considered them as a measure for institutional efficiency. Firstly, historians have stressed constitutional explanations.[206] This idea focusses on the activities of parliaments and argues that imposed checks on executive powers contributed to a country's institutional creditworthiness and efficiency via the protection of property rights.

[206] This term emanates from the title of North and Weingast's article 'Constitutions and commitment' (1989).

Constitutional controls entrusted investors that the state government would repay and not default on its debts in the distant future. As discussed before, the study of North and Weingast advocated this liberal vision by arguing that the efficiency of English economic institutions resulted from the check that English parliament imposed on the sovereign after 1688. The spectacular decrease of interest rates after the 1690s convinced the authors that these controls were of essential importance for the economy to improve the economic structure and secure property rights. North and Weingast's emphasis on the influence of constitutional checks on England's economic take-off has been criticised for the reason that interest rates do not show that England experienced a spectacular level of efficiency in comparison with countries like France.[207] As discussed in chapter three, a comparison of interest rates (figure 6) supports this criticism at first glance, and suggests that the English rate did not differ markedly from other European countries. However, Acemoglu et al. and Stasavage have made arguments that were comparable with North and Weingast's, though applying the idea on the Little Divergence and the emergence of the city-state advantage.[208] Following these authors, the evolution of interest rates should derive from a certain constitutional process.

A second explanation, in contrast, rejects the constitutional argument and points in a more technical direction. According to Epstein, constitutional checks and restrictions on the sovereign did not constitute England's creditworthiness and institutional efficiency.[209] Epstein pointed to a group of explanatory factors that were rather fiscal or technical in character and argued that political improvements were not as crucial as North and Weingast believed. Technical improvements enabled the state government to obtain tight control on financial issues, to employ successful fiscal practices and reach a higher level of credibility and societal trust. Therefore, from Epstein's point of view, it was the establishment of the Bank of England that made English interest rates decline so rapidly. Following this argument, the convergence of interest rates results from the influence that financial institutions had on market performance.

In essence, we are witnessing a conflict within the theoretical thinking of the institutional approach on economic growth. According to North, the relation between institutions is hierarchical. From his point of view, "the rules descend from polities to property rights to individual contracts," as political institutions set the stage for economic institutions which, in turn, set the stage for markets.[210] The same line of thought can be noted in North and Weingast's account. Epstein, however, argues that the rapid development of the English credit market could have occurred due to innovations of economic institutions, irrespective of any direct connection between improvements in political institutions and financial markets. The rapid decline of English interest rates since the 1690s raises the question to what extent representative institutions determined the evolution of public credit across Europe. The following section provides more accurate knowledge on the institutions that really contributed to the evolution of public debt mechanisms. It is argued that political factors fall short of a full explanation of what occurred on market level (the market for public credit) and thus did not directly pave the way for the Little Convergence. The link between political and economic institutions maybe is not as strong as North and his followers have suggested. Instead, the development of economic and financial institutions across Europe urged interest rates to converge.

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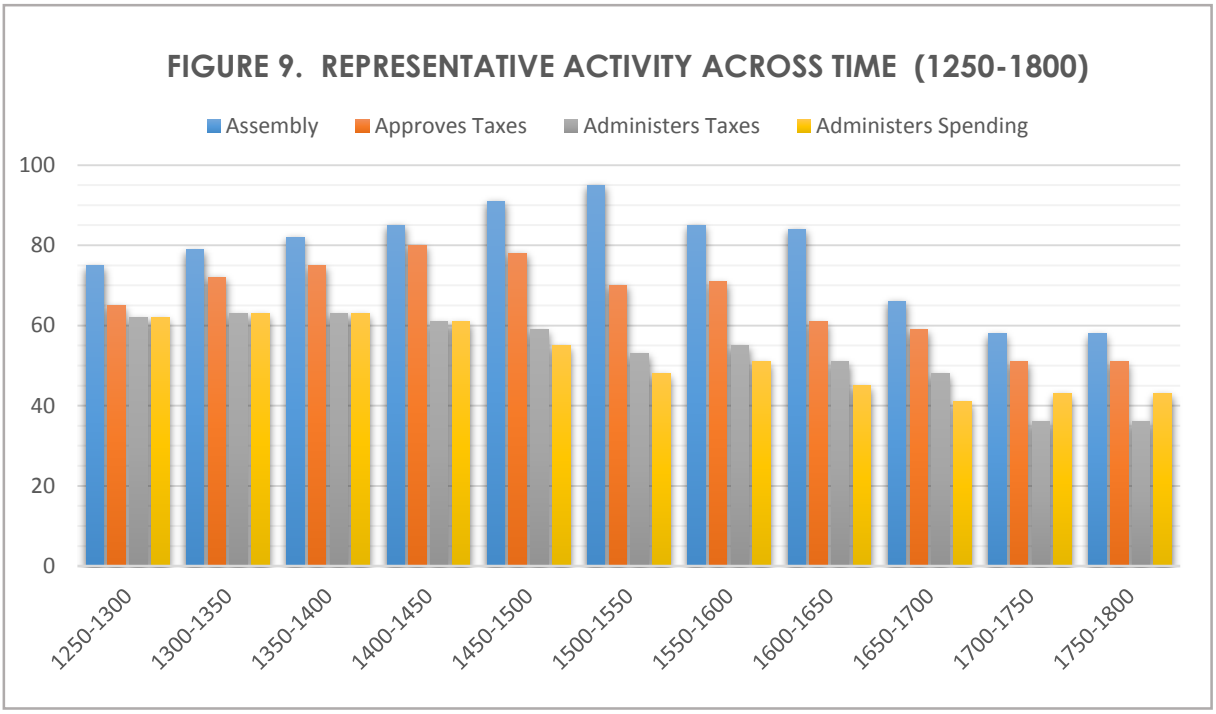
[207] For this discussion see Allen, *The British Industrial Revolution* (2009) 5.
[208] Acemoglu et al., 'The Rise of Europe' (2005); Stasavage, *States of Credit* (2011).
[209] Epstein, *Freedom and Growth* (2000) 29.
[210] North, *Institutions, Institutional Change and Economic Performance* (1990) 52.

### 4.3 Understanding the Little Convergence

In order to determine if constitutional factors were the main driving force behind the convergence of public debt mechanisms, the convergence of interest rates will be tested in view of the political institutions that had the potential to influence financial efficiency. More specifically, the Little Convergence is compared with the development of checks that representative assemblies imposed on executive powers. To trace the long-term influence of political institutions on credit markets, a quantitative measure for the activities of parliaments has to be introduced that distinguishes between different aspects of parliaments and their role as representative checks on executive power. Stasavage provides such a quantitative measure, discussing 31 states of which 30 are included in the sample of states that constitute the database of this research.[211] This measure derives from the assumption that creditworthiness is mainly improved if assemblies have influence on taxation and spending decisions. Therefore, it distinguishes between four different categories of activities that contribute to credibility. The first category represents the percentage of the total number of European states that had a representative body at state level with at least a consultative role in decision-making. The second category represents the cases in which an assembly controlled a large share of the country's taxation. The third category represents the number of assemblies that had a prominent role in administering and monitoring tax collection. Finally, the fourth category represents the percentage of assemblies that played a direct role in spending decisions. A representative body that met at least the second criterion, it is suggested, had tangible influence on a state's creditworthiness. If other criteria are also satisfied, that influence would have increased even more.

Let us first test the development of parliamentary activities in view of the general decline of interest rates throughout early modern Europe. Figure 9 pictures how the activities of representative institutions




*Source:* Stasavage, *States of Credit* (2011) 58.

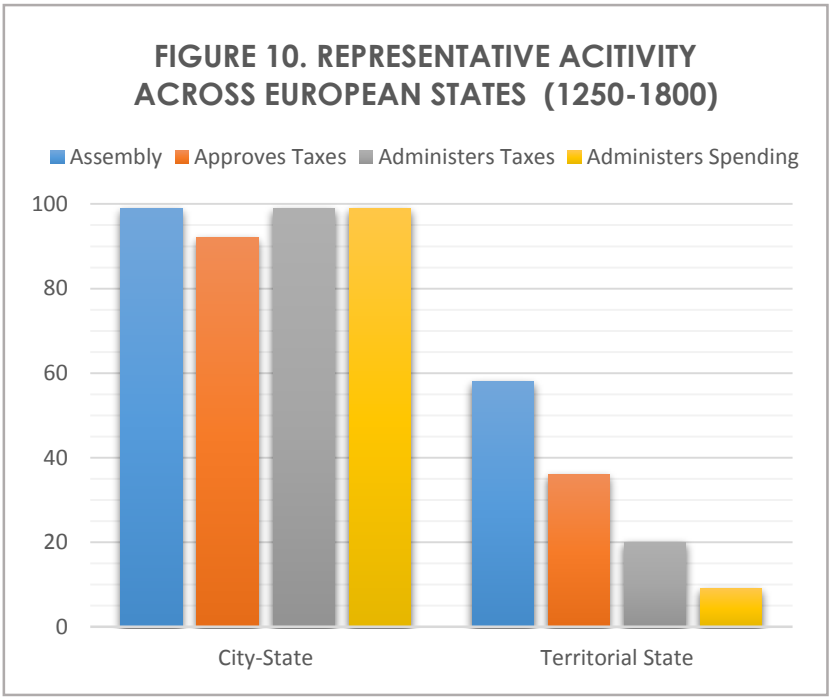
[211] Stasavage, *States of Credit* (2011) 54-61. Siena is incorporated in Stasavage's analysis on representative activity. I included four other states in my previous analysis (the Holy Roman Empire, Poland, Russia, Saxony). This incorporation of more territorial states into the analysis, will only strengthen the eventual conclusions.

developed between 1250 and 1800, including all states from Stasavage's sample without making any distinction between regions or states. Though the power of representative institutions proved to be decisive in the initial emergence of public debt systems during the Middle Ages, as discussed by Stasavage, the figure shows that the role of representative assemblies markedly declined after 1500, affecting all four criteria. The figure therefore shows the marked waning in the powers of representative assemblies to which George de Lagarde and Brian Downing have pointed too.[212] If this general decline of parliamentary influence is compared with the decline of interest rates throughout Europe, parliamentary checks seemed to evolve contradictory to the evolution of creditworthiness. Since a decrease of interest rates suggests that institutional creditworthiness increased between 1500 and 1800, it might be expected that the influence of representative assemblies and constitutional checks would have increased too. Because constitutional checks actually evolved in the opposite direction, this finding seems to suggest that constitutional factors were not responsible for the decline of interest rates.

For a full understanding whether constitutional or fiscal developments urged interest rates to converge, the constitutional explanation will be tested in view of the medieval appearance and early modern disappearance of the city-state advantage. As elaborated before, historians have argued that city-states acquired higher levels of financial efficiency because of their intensive form of representation, confirming the constitutional argument. If constitutional factors persisted to be the most notable explanation for the further development of interest rates, one would suggest that a substantial difference in the rates of interest between territorial and city-states remained to exist as long as the representative difference prevailed. The previous chapter, however, provided evidence for the decline of this margin during the early modern period (figure 7). A marked difference between the two types of debt systems disappeared. This implies that under this circumstance, if the most notable explanation for the convergence of debt mechanisms is a constitutional one, representative assemblies should have shown a similar convergence.

A further consideration of the activities of representative institutions, while also differentiating between territorial and city-states, confirms that the constitutional deviation remained to exist as the margin between the interest rates of both systems disappeared. Figure 10 shows how the four categories were distributed between territorial and city-states during the same period as pictured in figure 9. The power of representative assemblies proved to be markedly more dominant in city-states, scoring almost 100 percent for all four categories over the whole period. Representative influence and representative checks in city-states remained almost unchanged over the whole period. However, the figure tells a very different story concerning territorial states. Although a sizeable 60 percent of the territorial states contained a representative body with at least a consultative role in decision making, many of the assemblies had a relatively weak role with regard to finance. Only 36 percent of the territorial states had an assembly that could really improve the states' creditworthiness, meeting at least the second category. Only three states, the Netherlands, Württemberg and England (after 1688) accounted for the 10 percent

[212] G. de Lagarde, 'Individualisme et corporatisme au Moyen Âge', in: *L'Organisation corporative au Moyen Âge à la fin de l'Ancien Régime* (Louvain 1937); B. Downing, *The Military Revolution and Political Change: Origins of Democracy and Autocracy in Early Modern Europe* (Princeton 1992). This interpretation is very widely agreed. Nevertheless, there is not a general agreement as to why this was the case. One interpretation points to a gradual and exogenous rise of absolutism. As kings proved to be capable of raising taxes themselves, representative institutions influence diminish Another vision poses that, after 1500, representative assemblies actually presented obstacles to satisfying the imperatives for states to obtain financing.




*Source:* Stasavage, *States of Credit* (2011) 58.

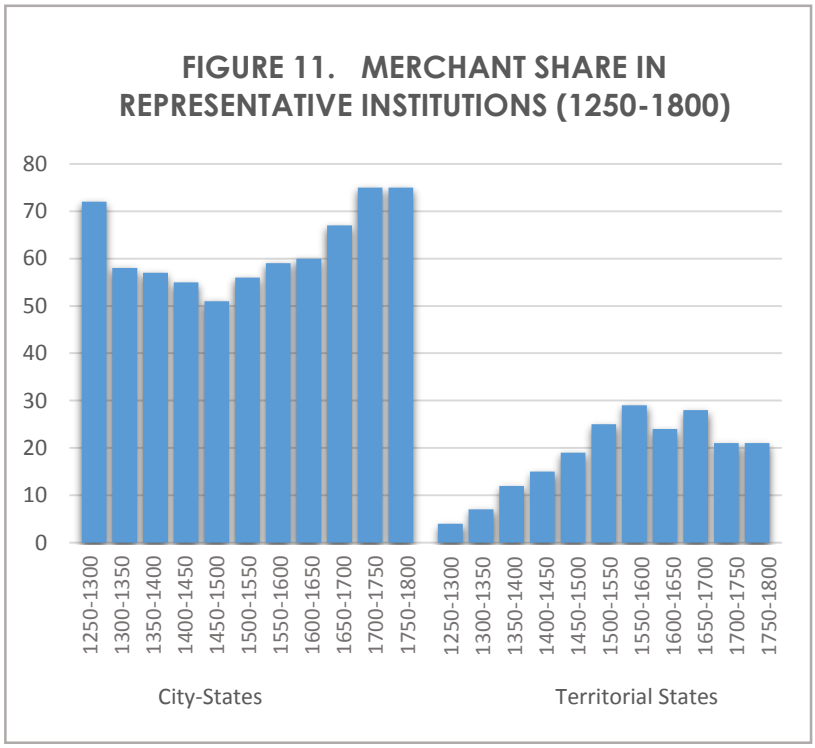
of states that contained assemblies with a direct role in spending decisions.[213] Therefore, the figure confirms that representative bodies in territorial states were remarkably less active than their city-state counterparts. A combination of both figure 9 and 10, moreover, provides insights in the development of representative activities over time. Because the activities of city-state assemblies did not change considerably between 1250 and 1800, scoring 100 percent for almost all categories, the average decline of representative influence throughout Europe after 1500 (pictured in figure 9) has to be attributed to a decline of representative activity within territorial states.[214] In other words, city-states experienced considerably more constitutional checks than territorial states until at least the eighteenth century. Underlying conditions for the city-state advantage, that initially caused the intensive representative bodies to emerge, also remained to exist until the eighteenth century. Stasavage argued that the city-state could maintain its form of representation because of its small geographical size and the mercantile domination in its political institutions. Accounting for the geographic argument, we can presume that the city-states under consideration stayed substantially smaller geographical entities than territorial states. An observation of the merchant's share in representative bodies across both types of states, confirms that the second underlying condition also continued to predominate in city-states' assemblies (figure 11). Hence, if also these underlying conditions are taken into account, the conclusion remains unchanged.

Although representative activities forced the city-state advantage to emerge during the Middle Ages, figure 9 and 10 seem to suggest that the most notable explanation for the early modern convergence of debt mechanisms is not a constitutional one. Constitutional differences between both types of states persisted to exist until 1800. Assuming that the territorial and city-states' constitutional frameworks continued to influence the efficiency of public capital markets, one would expect that structural differences in credibility levels and interest rates should also have persisted over time. Nevertheless, the previous chapter elaborated that, as interest rates across the continent converged, the margin between territorial and city-states almost disappeared (figure 7). The prevailing constitutional difference did not result in an advantageous creditworthiness: both types of debt systems reached a comparable level of financial efficiency. This argument is supported by a recent study on the development of parliaments

[213] Stasavage, *States of Credit* (2011) 59.
[214] It has to be stated that the effect of this decrease has been magnified by the disappearance of some city-states in the representative activity sample of Stasavage.

across European regions. Van Zanden, Buringh and Bosker made an effort to quantify parliamentary activity for the different European regions, though not making a similar distinction between different categories that affect creditworthiness.[215] They argued that an institutional divergence took place after 1500, as parliaments declined in central and southern Europe and gained in importance in northwest Europe, Sweden and Switzerland.[216] In other words, they confirm that the convergence of interest rates could not have been caused by an integration of political practices.

Reflecting on the findings considering parliamentary activity, it is suggested that early modern Europe was experiencing a very remarkable pair of paradoxical developments. While differences between constitutional institutions remained to exist or even diverged, creditworthiness and the efficiency of financial markets converged throughout Europe. The hierarchical relation between political institutions and public debt markets via financial and economic institutions, proved to be not as strong as North has suggested. Public debt markets were fully functioning while political institutions lost its initial efficiency. However, something urged financial markets to become more and equally efficient. As a direct connection between political institutions and markets is absent, the cause for the Little Convergence has to be found in a fiscal explanation.




*Source:* Stasavage, *States of Credit* (2011) 63.

### 4.4 Talking about 'integration'? Trans-European convergence of fiscal practices

As constitutional institutions throughout Europe would only become similar to each other after 1800, the most notable explanation for the convergence of interest rates during the early modern period is a financial one. As interest rates show a marked convergence during the early modern period, political checks and representative activities that had the ability to influence creditworthiness, continued to differ. However, the convergence of interest rates suggests that capital markets were very similar, both between and within different European regions at this time, either in development and/or integration.[217] This implies that by the eighteenth century, European governments had become familiar with comparable financial practices even though political integration would only occur after the French Revolution. The convergence of interest rates was therefore caused by technical developments, as has been suggested by Luciano Pezzolo who accounted for the developments in seventeenth and eighteenth-

[215] Van Zanden et al., 'The Rise and Decline of European Parliaments', 835-861
[216] *Ibidem,* 836 and 859.
[217] An issue also raised by Bateman, *Markets and Growth in Early Modern Europe* (2012) 120.

century Italy.[218] He argued that the obvious integration of Italian states, as witnessed in figure 4, was driven by innovations in the financial sector, comparable to the Financial Revolutions, that helped rulers to attract investors and raise large amounts of money at modest costs. As soon as Italian territorial states began to establish institutions with the ability to improve the collection of revenues and widen the markets for debt beyond restricted court or narrow urban circles to regional levels, interest rates and market performances converged.[219]

Indeed, the previous chapter has discussed a convergence of public interest rates in the Italian region between 1500 and 1800, what proves to be a convergence of fiscal and technical practices. A similar development has been suggested in the central European regions. Moreover, we see a general trans-European convergence of interest rates during this period, which once more seems to point to a converging market for public debt shares (figure 3). However, although a marked convergence of European interest rates is obvious, "the possibility always remains that [...] convergences of interest rates between two capital markets may be due to factors other than integration.[220] The visible patterns, delivered in the previous chapter, do not capture the appearance and/or intensiveness of this integration as statistical analyses do. Hence, several statistical methods can be applied to obtain more accurate information on the degree that governmental financial markets were really integrated or linked with each other.

Firstly, historians have applied statistical methods to measure the ability of financial markets to cushion monetary and economic shocks via trade. This method addresses the 'coefficient of variation' (a dimensionless measure equal to the standard deviation divided by the mean), quantifying the variableness of prices across several markets. The smaller this coefficient is, the lower the level of price dispersion, which indicates a greater extent of market integration. Normally, one would choose a few moments across time on which a large quantity of dense information is available (monthly, but even more preferably weekly or daily data). More desirably, the historian chooses periods in history when markets suffered from serious price shocks in order to put their cushion abilities to the ultimate test. As integration of public debt markets continued, one would expect that the fluctuation of prices and therefore the coefficient of variation decreased over time. However, applying this method on public interest rates raises some serious methodological problems. The database has rather compiled annual interest rates and pictures the price of a public loan somewhere during the year under consideration. Government bonds were not issued as regularly as payments occurred on both money and stock exchanges. Moreover, it proves that interest rates did not fluctuate as much as grain prices and exchange rates. Alternatively, the database did not capture the exact fluctuations because of a lack of regular issuance. Finally, in order to deliver a reliable picture, incorporating as many sources as possible, the database provides averages of the rates that very different secondary sources have delivered. As a result, the database does not offer the same information density as contributions on exchange rates for either money or stock exchanges. Therefore, the database on public interest rates does not succeed to capture price fluctuations as true as the method supposes. The long-time series on interest rates do not allow for profound conclusions on the exact reaction of public capital markets on financial and economic shocks.

The second statistical method that has been applied to measure market integration, determines the level of mutual influence between two variables. This implies that the correlation between two data

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[218] Pezzolo, 'Republics and principalities in Italy' (2012).
[219] *Ibidem,* 282.
[220] Neal, *The Rise of Financial Capitalism* (1990) 166.

series is measured, so actually calculating the correspondence between specific fluctuation of prices, exchange rates or, in this case, interest rates. For the same reason as stated above, however, it is highly difficult to trace the exact price fluctuations of public interest rates. Hence, the character of the data does not allow these two types of statistical analysis to trace the exact level of integration (i.e. the exchange of public securities). Nevertheless, although direct integration between public debt shares cannot be proven with this data, correlations still have the ability to complement visual patterns by giving more profound evidence on the extent that public debt mechanisms followed comparable long-term trajectories. The data stream on interest rates enables us to discover the overall correspondence between debt mechanisms, while accounting for three centuries and the entire European continent. Therefore, the Pearson's correlation coefficients, pictured in table 2, serve as a statistical measure for the level of correspondence between the public mechanisms under consideration. A positive coefficient suggests that both variables have influenced each other positively, moving in exactly the same direction, where negative coefficients suggest that both variables have followed in opposite directions. A coefficient close to 0 indicates no correlation at all, while a correlation close to 1 or -1 indicates a very strong (positive or negative) mutual correspondence. Moreover, the table shows whether the coefficient is significant (*) and the number of analogous variables in both data series on which the correlation coefficient is based. The statistical analysis is based on 10-year averages of interest rates between 1500 and 1800 and takes this whole period into consideration in order to reach a high significance (applying the 2-tailed test).

Table 2 pictures the correlation coefficients for different interest rate trajectories throughout Europe, considering states within the same region as well as states that were geographically very distant from each other. The results suggest a correlation (> 0.5) or even high correlation (> 0.8) for a considerable number of combinations. This is especially true for the correlation coefficients that also prove to be significant. Moreover, all significant correlation coefficients have a positive value what suggests that the variables have moved into the same direction (corresponding with the general decline of interest series). The considerable height of the correlation coefficients suggests that capital markets were developing in notable accordance with each other. This trend is visible throughout the whole continent, considering both states within a same region but also states that were geographically very distant. The results suggest that European public debt mechanisms, irrespective of the regions they were part of, have developed in remarkably similar ways. The correlation coefficients confirm that the convergence of financial markets was a trans-European phenomenon in which geographically adjacent but also very distant countries developed in strong resemblance with each other.

Yet, the question remains to what extent this integration has been influenced by the actual international exchange and trade of debt shares. For northwest Europe, we know that seventeenth and eighteenth-century securities markets gradually broadened and deepened, with London and Paris joining Amsterdam as markets where foreign securities could be traded.[221] Amsterdam became a haven for both European rulers who wished to sell public debt shares and investors who were hungry for high returns on their investments.[222] Fynn-Paul elaborated the internationalization of public debt shares from an investors' point of view and showed how the wealthy Dutch Van der Meulen family drew its attention on international lucrative investments.[223] The international exchange of European public debt shares

[221] Fynn-Paul, 'The Evolution of Eighteenth-Century Investment Capitalism', 3. See also Neal, *Rise of Financial Capitalism* (1990); M.C. 't Hart et al., *A Financial History of the Netherlands* (1997).
[222] Fynn-Paul, 'The Evolution of Eighteenth-Century Investment Capitalism', 25.
[223] *Ibidem,* 3.

culminated in eighteenth-century Amsterdam until the world's leading financial centres transited from public debt markets to stock exchanges. Eventually, at the end of the eighteenth century, the London stock exchange, in which British private companies offered lucrative and secure investments, began to outperform the international public debt market. For the Netherlands and England, Neal has suggested that the Amsterdam and London stock exchanges mutually influenced each other directly through the actual integration of shares of great joint-stock corporations since the 1720s.[224] Because of the considerable degree of this integration as early as the beginning of the eighteenth century, it could be

**TABLE 2. CORRELATION COEFFICIENTS OVER 10-YEAR AVERAGES (1500-1800)**

| | England | Holland | Bologna | Genoa | Milan | Naples | Piedmont | Tuscany | Venice | Austria | Bremen | Geneva | France | Castile |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **England** | | .861* 18 | .946* 9 | .452 16 | .899* 17 | .865* 14 | .534 11 | .870* 14 | .587* 17 | .730* 12 | .394 17 | -.053 4 | .655* 15 | .902* 6 |
| **Holland** | .861* 18 | | .626* 20 | .539* 27 | .878* 24 | .770* 22 | .726* 16 | .706* 16 | .708* 27 | .819* 17 | .428* 28 | .535 11 | .329 22 | .405 15 |
| **Bologna** | .946* 9 | .626* 20 | | .609* 21 | .830* 17 | .959* 14 | .752* 9 | .698 8 | .440 19 | .932* 9 | .151 21 | .235 11 | .441 14 | .835* 16 |
| **Genoa** | .452* 16 | .539* 27 | .609* 21 | | .630* 24 | .685* 21 | .431 15 | .569* 15 | .294 26 | .510* 16 | .158 27 | .432 11 | .215 20 | .324 16 |
| **Milan** | .899* 17 | .878* 24 | .830* 17 | .630* 24 | | .859* 20 | .823* 16 | .777* 16 | .639* 23 | .872* 17 | .427* 24 | .657* 10 | .327 19 | .787* 12 |
| **Naples** | .865* 14 | .770* 22 | .959* 14 | .685* 21 | .859* 20 | | .705* 13 | .848* 12 | .729* 21 | .746* 18 | .266 22 | .304 7 | .745* 18 | .837* 12 |
| **Piedmont** | .534 11 | .726* 16 | .752* 9 | .431 15 | .823* 16 | .705* 13 | | .811* 11 | .616* 15 | .813* 12 | .408 15 | .696 6 | .255 13 | .676 6 |
| **Tuscany** | .870* 14 | .706* 16 | .698 8 | .569* 15 | .777* 16 | .848* 12 | .811* 11 | | .415 15 | .852* 12 | .254 15 | -.200 5 | .125 12 | .611 6 |
| **Venice** | .587* 17 | .708* 27 | .440 19 | .294 26 | .639* 23 | .729* 21 | .616* 15 | .415 15 | | .732* 16 | .361 27 | .394 11 | .473* 20 | .323 14 |
| **Austria** | .730* 12 | .819* 17 | .932* 9 | .510* 16 | .872* 17 | .746* 18 | .813* 12 | .852* 12 | .732* 16 | | .637* 17 | .832 5 | .114 13 | .900* 8 |
| **Bremen** | .394* 17 | .428* 28 | .151 21 | .158 27 | .427* 24 | .266 22 | .408 15 | .254 15 | .361 27 | .637* 17 | | .357 11 | .031 21 | -.054 16 |
| **Geneva** | -.053 4 | .535 11 | .235 11 | .432 11 | .657* 10 | .304 7 | .696 6 | -.200 5 | .394 11 | .832 5 | .357 11 | | .280 7 | .022 7 |
| **France** | .655* 15 | .329 22 | .441 14 | .215 20 | .327 19 | .745* 18 | .255 13 | .125 12 | .473* 20 | .114 13 | .031 21 | .280 7 | | .773* 10 |
| **Castile** | .902* 6 | .405 15 | .835* 16 | .324 16 | .787* 12 | .837* 12 | .676 6 | .611 6 | .323 14 | .900* 8 | -.054 16 | .022 7 | .773* 10 | |

possible that such an exchange of shares, but then considering public securities, also occurred before the transition. After the transition, the ease of integration would then be improved by increasing the number of commonly listed securities, especially after the mid nineteenth century. However, the twentieth-century level of integration seems not to have been substantially higher than it was in the first half of the eighteenth century, once again stressing the considerable level of integration that was already achieved by that time.[225]

[224] Neal, *The Rise of Financial Capitalism* (1990) 145-178.
[225] *Ibidem,* 178-179.

As expected, the evidence on public interest rates shows a high level of integration of the Dutch and English securities markets through the early modern period (coefficient of 0.861). However, the results also suggest that the English securities market showed more resemblances with very distant countries than with the Holland financial system. This concerns for instance Bologna, Milan, Naples and Tuscany (significant coefficient of 0.946, 0.899, 0.865 and 0.870 respectively). This is rather strange considering the geographical distance between the English and Italian markets. The same can be said for Milan, which shows a higher correlation with distant markets in England, Holland and Austria than with geographically adjacent Italian counterparts. For these and several other combinations that show a high correlation, there are no indications to believe that they were as directly or intensively connected as the correlation coefficients suggests. In some cases, the coefficients suggest that the instruments to channel international securities were more similar with distant markets than with adjacent markets. However, although it is highly improbable that distant debt markets were directly integrated in such an extent, the correlation coefficients do suggest that public debt mechanisms throughout Europe showed remarkable similarities.

So, although no direct level of integration can be provided with this evidence, correlations suggest a considerable level of resemblance between securities markets for which there are no indications that direct connections existed as early as the early modern period. Nevertheless, this also suggests that countries throughout Europe, with or without direct integration, followed considerably similar trajectories and somehow achieved to adopt financial models that were comparable with the most sophisticated financial systems. A convergence of interest rates did not only affect the regions for which there is actual evidence on the intensive exchange of securities, as Larry Neal provided for the Dutch and English stock markets. Moreover, correlations suggest how strong and general this trans-European phenomenon was.

The internationalization of fiscal and technical practices could be partly based on the international character of the public debt share. The convergence of financial institutions occurred in a seventeenth and eighteenth-century Europe in which, as Dickson has reckoned, economists, policy makers and merchants were obsessed with international interest rate comparisons.[226] Before Amsterdam developed itself as a hub for international capital seekers, mechanisms of public borrowing and governmental debt shares were the first practices and instruments to actually go abroad. Traders who were also acting as investors and wished to turn a profit, spread over Europe as trading activities expanded. Beside capital, these wealthy men also brought knowledge on financial systems with them. More specifically, as Stasavage has suggested, a combination of mercantile interests and governmental necessity actually urged the system of public borrowing to emerge. Already in the Late Middle Ages, banking and merchant families did not only provide their own city governments with public capital but also transferred large sums of money to rulers across the European continent. Chapter two introduced Henry of Luxembourg and Edward III of England who depended on debt services from investors abroad, in their cases from Italian lenders. Mauricio Drelichman and Hans-Joachim Voth explained how both Charles I and Philips II of Castile, in cooperation with their bankers, created sophisticated and flexible financing instruments in which Genovese families as well as the German Fugger and Welser families were contracted to account

[226] M. Flandreau, C. Galimard, C. Jobst and P. Nogués-Marco, 'The Bell Jar: Commercial Interest Rates between Two Revolutions', in: J. Atack and L. Neal (eds.), *The Origin and Development of Financial Markets and Institutions. From the Seventeenth Century to the Present* (Cambridge 2009) 163; Dickson, *The Financial Revolution in England* (1967) 304-305.

for a large part of the debt market.[227] The kings' endless demands for cash permanently influenced the empire's financial framework, both in Castile and the Habsburg provinces across the continent as the Duchy of Milan and the Kingdom of Naples.[228] Finally, the financial markets included many individuals who were either foreign themselves or who had strong connections outside the country.[229] Merchants and financiers had liquid wealth available to invest in public debt, and their familiarity with financial instruments and intangible forms of wealth made them more willing to make risky investments, even in foreign countries.[230]

In conclusion, the evidence on the Little Convergence suggests that, by the seventeenth and eighteenth century, countries were able to create effective public debt systems in accordance with sophisticated and integrated regions on which we have profound evidence: the northwest European region. Partly due to the international character of public debt shares, countries learned how to adopt the most sophisticated financial models to their own local situations. Moreover, the correlation suggest that these public debt mechanisms did not only end up in great similarity in the eighteenth century but also followed highly comparable trajectories during the entire early modern period. It is highly probable that European rulers copied fiscal and technological practices and applied them to their own economies, irrespective of any suggestion of direct exchange of public debt shares since public debt shares were in many places a principal form of monetary investment in the early modern period, the invention of public debt mechanisms had a strong mercantile character, and because the development of very distant markets throughout Europe shows a marked correlation. As we saw before, this resulted in a convergence of interest rates, the Little Convergence, which, by implication, helped to integrate the economies of Europe. Because public debt shares were considered as a principal form of investment and had the potential to foretoken developments towards truly mass mobilization of savings, it is very plausible that throughout early modern Europe financial markets in general were converging.

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[227] M. Drelichman and H.J. Voth, *Lending to the Borrower from Hell: Debt, Taxes and Default in the Age of Philip II* (Princeton 2014) 132-172.
[228] Pezzolo (2012) 277-278.
[229] Carruthers, 'Rules, institutions, and North's institutionalism (2007) 48.
[230] *Ibidem.*

# CONCLUSION

This paper has aimed to prove that interest rates on public debt can be applied to construct both a direct measure for the efficiency of financial markets and an indirect measure for the sophistication of economies by implementing an institutional approach on economic growth. It has introduced a comprehensive database on public interest rates, which reconciles fragmented information from a large number of secondary sources. The quantitative evidence presented in this paper enables us to trace the trajectories of 34 different European financial markets and economies from 1250 through 1800. However, this paper has placed its emphasis on the period of the so-called Little Divergence (from 1450 through 1800) in which estimated wage rates between the northwest and the rest of Europe show a marked divergence. Proponents of the Little Divergence theory have advocated that the inter-European divergence of real wages in fact reflect the relative economic sophistication of the northwest of Europe. However, this paper has argued that the Little Divergence theory has suffered from an over-reliance on wage rate estimates. It has tried to provide additional evidence that shows that the Little Divergence was not as profound as current theory holds. The general finding is that interest rates suggest that, in some ways, early modern Europe shows evidence of an economic convergence rather than a divergence.

This paper has introduced several indicators for economic sophistication. The first measure for the efficiency of economic institutions relates to creditworthiness, as it is believed that the rate of credibility reflects the intensity of interaction and cooperation within an economy. Evidence on public interest rates suggests that institutional frameworks throughout Europe became substantially more efficient during the early modern period. Europe experienced a general decreasing trend of interest rates throughout the entire continent. Moreover, we find that public interest rates notably converged during the early modern period, suggesting that financial systems began to resemble each other. If the efficiency of financial frameworks is used as a measure for economic sophistication, this implies that European economies became increasingly similar. The evident convergence of interest rates, the so-called Little Convergence, seems to show a clear contradiction of what the Little Divergence theory has heretofore suggested.

The second indicator for the efficiency of economic institutions relates to market integration, as it is commonly agreed that efficient market structures serve as evidence of high economic efficiency as well as conditions for further economic growth. This paper has argued that the notable convergences of interest rates in Italy and Central Europe, both to be supposed as less sophisticated regions, in fact indicate high levels of market integration. These findings seems to contradict the predictions of the Little Divergence theory once again. Since securities were in many places a principal form of monetary investment, one could argue that the convergence of interest rates suggests that markets for financial investments in general became more similar in these regions, what stands even more in contradiction to what the Little Divergence theory suggests.

In addition to these findings, the presented evidence suggests a trans-European convergence of public debt mechanisms. The difference in financial efficiency between territorial and city-states, the so-called city-state advantage which was very notable during the Middle Ages, disappeared during the early modern period. The differences between various European regions declined too. Besides, correlation coefficients suggest that countries across the continent, adjacent as well as distant, evolved in strong resemblance with each other. This seems to suggest that a high level of European market integration was

reached as soon as the early modern period (or the seventeenth century since debt mechanisms from all countries but England converged). Unfortunately, the character of the data on public interest rates makes it impossible to deploy statistical methods in order to prove the existence of a direct exchange of public securities throughout the entire continent. However, correlation coefficients do suggest that several countries, for which there is no indication of the existence of any form of direct market integration, were developing in notably similar trajectories. It is believed that this suggests that, partly due to the international character of public debt shares, countries learned how to adopt the most sophisticated financial models to their own local situations. These resemblances in financial practices helped to integrate the economies of Europe towards the eighteenth century. Nevertheless, it remains an important question for future research when the international exchange of public securities, so the direct integration of markets, actually reached substantial levels. The evidence from public interest rates seems to suggest that such a direct integration could have been established in more regions and considerably earlier than historians have recently believed.

Finally, this paper has suggested that the Little Convergence was rather a convergence of fiscal and technical practices than a convergence that was driven by political factors. Stasavage has argued that these political factors were decisive in the initial emergence of the city-state advantage in the Middle Ages. Nevertheless, these political factors fall short of an explanation of what occurred in public debt markets after 150. While public interest rates suggest that financial instruments across Europe converged, representative activities that touched creditworthiness and trust actually diverged. The argument that North and Weingast made about England, reaching an exceptional level of efficiency due to peculiar representative institutions, therefore needs considerable nuance. It shows that states without representative checks were also able to achieve considerable levels of economic sophistication. In addition, the argument that northwest Europe distinguished itself from the rest of Europe due to its constitutional checks, as Acemoglu et al. argued, has also to be subjected to more research. The presented evidence suggests that constitutional factors were not as important for the efficiency of economic institutions and markets as technical factors. Economic institutional frameworks were not always as directly and vehemently influenced by political institutions as Douglass North has suggested.

The findings of this paper suggest that more future research is needed to determine the exact role of political and financial institutions in stimulating economic growth. The connection between political and economic institutions proves to be not as self-evident as the institutional theory holds. Early modern economic institutions proved to be quite efficient without a strong incentive from above. Apparently, there were other ways to acquire financial systems that stimulated creditworthiness and market integration. At the same time, it seems that political institutions did play a decisive role in the emergence of efficient markets. Stasavage provided evidence that the city-state advantage was initially caused by constitutional factors. Both contrasting interpretations can be reconciled once a balance is reached between having a government that is strong enough to enforce property rights and a government that it is not willing to introduce fiscal innovations and is only obsessed with appropriating all gains from trade. Nevertheless, from an institutional point of view, the simultaneous occurrence of a marked divergence of political institutions and an even more obvious convergence of financial practices is rather remarkable. While European countries converged on financial practices during the early modern period, political practices would only converge after the French Revolution. This theoretical paradox has to be subjected to more future research.

In general, this paper has shown that the over-reliance on wages, that the Little Divergence theory has heretofore done, should be called into question. It argues that unbiased indicators should be brought to bear. Historians have made a good start with the production of GDP per capita estimates which have nuanced the evident inter-European divergence that wage rates have suggested. This paper, in its own way, contributed to the debate by delivering new, unbiased, quantitative evidence on the growth trajectories of European economies. It tried to create a more nuanced picture of what was occurring within the European economy from 1450 through 1800. It provided additional evidence that shows that the Little Divergence was not as cut-and-dried as economic historians currently believe. Findings show that countries throughout Europe began to adopt similar financial practices, certainly in regard to public debt mechanism. Since public debt shares were a well-known form of monetary investment, the evidence presented in this paper has also the potential to suggest that markets for financial investments in general were converging. Moreover, following the line of thought that public debt mechanisms were the predecessor of practices that had the potential to mobilize mass savings, one could argue that financial frameworks in general became to resemble each other.

In conclusion, interest rates suggest that, in some ways, early modern Europe experienced a 'Little Convergence' rather than a 'Little Divergence.' If it is assumed that the efficiency of financial systems has direct bearing on the state's economic sophistication, the evidence suggests that northwest Europe was not as evidently 'better' or 'more efficient' as the Little Divergence theory has suggested. Hence, more quantitative evidence and indicators on economic sophistication should be provided to acquire a more reliable picture on the different trajectories of early modern European countries. Consideration of nuances and the enlargement of the area of measurement enables improvements in understanding explanatory factors. Eventually, this will bring us closer to explanations for the economic miracle of the Industrial Revolution as it sheds more light on the economic history of pre-modern Europe. An economic history that proves to be a history of divergences… as well as convergences.

## APPENDIX A. EUROPEAN PUBLIC INTEREST RATES (50-YEARS AVERAGES IN %) 1250-1800

### Central Europe: Territorial States

| Year | Austria (1555-1780) | Denmark (1700-1799) | Germany (1496-1780) | Württemberg (1550) |
|---|---|---|---|---|
| 1250 | | | | |
| 1300 | | | 20.8 [1] | |
| 1350 | | | | |
| 1400 | | | | |
| 1450 | | | 5 [2] | |
| 1500 | | | | |
| 1550 | 7.13 | | | 5.06 |
| 1600 | | | | |
| 1650 | 5.5 | | | |
| 1700 | 5.72 | 4.5 | 5 [3] | |
| 1750 | 3.99 | 4.5 | 4.68 | |

### Central Europe: City-States

| Basel (1383-1479) | Bremen (1357-1798 |
|---|---|
| | |
| | |
| 6.97 | 7.14 |
| 4.99 | 6.72 |
| 4.49 | 5.62 |
| | 5.02 |
| | 4.95 |
| | 5.05 |
| | 4.73 |
| | 5.21 |
| | 3.98 |

| Year | Cologne (1351-1474) | Dortmund (1375-1399) | Geneva (1538-1681) | Hamburg (1350-1600) | Mainz (1400-1444) | Nuremberg (1381-1565) | Zurich (1325-1414) |
|---|---|---|---|---|---|---|---|
| 1250 | | | | | | | |
| 1300 | | | | | | | 10 |
| 1350 | 7.37 | 11.67 | | 6.67 | | 9.18 | 9.65 |
| 1400 | 4.38 | | | 6.67 | 4.02 | 7.66 | 8.84 |
| 1450 | 3.74 | | | 6.67 | | | |
| 1500 | | | 5 | 6.67 | | 5 | |
| 1550 | | | 7.83 | 5.85 | | 7.67 | |
| 1600 | | | 7.65 | 6.67 | | | |
| 1650 | | | 6.79 | | | | |
| 1700 | | | | | | | |
| 1750 | | | | | | | |

### Southern Europe: Territorial States (Italy)

| Year | Bologna [4] (1500-1699) | Naples (1520-1799) | Rome (1526-1785) | Piedmont (1630-1785) | Milan (1540-1785) | Tuscany [5] (1550-1785) |
|---|---|---|---|---|---|---|
| 1250 | | | | | | |
| 1300 | | | | | | |
| 1350 | | | | | | |
| 1400 | | | | | | |
| 1450 | | | | | | |
| 1500 | 8.04 | 9.78 | 10 | | 8.2 | |
| 1550 | 7 | 8.5 | 6.99 | 10.5 | 9.85 | 8 |
| 1600 | 5.36 | 7 | 6 | 3.75 | 6.61 | 4.88 |
| 1650 | 4.02 | 4.95 | 3.5 | 4.89 | 5.45 | |
| 1700 | | 5 | 1.85 | 4.81 | 3.77 | 4 |
| 1750 | | 5.06 | 1.84 | 3.1 | 2.74 | 2.37 |

(Spain)

| Year | Aragon [6] ( - ) | Castile (1489-1779) |
|---|---|---|
| 1250 | | |
| 1300 | 15 | |
| 1350 | 9.8 | |
| 1400 | | |
| 1450 | | 10 |
| 1500 | | 7.73 |
| 1550 | | 6.3 |
| 1600 | | 5 |
| 1650 | | 5.5 |
| 1700 | | |
| 1750 | | 6 [7] |

**Southern Europe: City-States** (Italy and Spain)

| Florence (1347-1499) | Genoa (1303-1785) | Siena [8] ( - ) | Venice (1262-1799) | Barcelona (1360-1640) |
|---|---|---|---|---|
| | | 20 | 9.69 | |
| 5 | 8.75 | 12.34 | 8.38 | |
| 4.95 | 8.858 | 8.75 | 4.64 | 7.02 |
| 4.25 | 6.08 | | 4 | 4.84 |
| 2.85 | 3.18 | | 4.36 | 4.9 |
| | 3.22 | | 5.71 | |
| | 3.65 | | 5.6 | 4.01 |
| | 3.28 | | 5 | 4.5 |
| | 2.58 | | 4.69 | |
| | 2.68 | | 3.89 | |
| | 3.08 | | 2.64 | |

**Northwest Europe: Territorial**

| Year | England (1693-1798) | Holland (1522-1800) |
|---|---|---|
| 1250 | | |
| 1300 | 26 | 20 |
| 1350 | | |
| 1400 | | |
| 1450 | | |
| 1500 | 16.8 | 6.25 |
| 1550 | 13.5 | 9.4 |
| 1600 | 9.11 | 5.97 |
| 1650 | 8.17 | 3.84 |
| 1700 | 4.89 | 2.49 |
| 1750 | 3.78 | 1.8 |

**Northwest Europe: City-States**

| Arras (1241) | Bruges (1299-1492) | Douai (1295-1399) | Ghent (1353-1399) |
|---|---|---|---|
| 15.5 | 15 | 9.1 | |
| | | 10 | |
| | | 10 | 9.33 |
| | | | |
| | 8.57 | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Other Territorial States**

| Year | France (1522-1793) | Poland (1744-1755) | Russia (1760-1800) |
|---|---|---|---|
| 1250 | | | |
| 1300 | | | |
| 1350 | | | |
| 1400 | 19 | | |
| 1450 | 17.5 | | |
| 1500 | 8.33 | | |
| 1550 | 8.33 | | |
| 1600 | 6.22 | | |
| 1650 | 7.66 | | |
| 1700 | 5.52 | 4.8 | |
| 1750 | 6.07 | 5.08 | 4.93 |

[1] Average considering the Holy Roman Empire.
[2] Average considering Saxony.
[3] Averages considering Holy Roman Emperor.
[4] In the categorization of Bologna, the dataset has followed Epstein, *Freedom and Growth* (2000) 20-23.
[5] Florence was absorbed by territorial Tuscany from in the sixteenth century.
[6] The character of the rates delivered by Fynn-Paul (2015), are issued at municipal rather than state level. Rates delivered in order to enable comparison.
[7] Average considering Bourbon Spain.
[8] The character of the rates delivered by Bowsky (1970), are issued for a short term rather than long term. Rates delivered in order to enable comparison.

## APPENDIX B. EUROPEAN PUBLIC INTEREST RATES (10-YEARS AVERAGES IN %) 1500-1800

| Year | Austria | Denmark | Germany | Württemberg | Bremen | Geneva | Hamburg | Nuremberg | Bologna | Naples | Rome | Piedmont |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1500 | | | | | 5.08 | | 6.67 | | 8 | | | |
| 1510 | | | | | 4.79 | | | | 8 | | | |
| 1520 | | | | | 4.89 | | 6.67 | | 8 | 9.5 | 10 | |
| 1530 | | | | | 5 | 5 | | | 8.2 | 10.5 | | |
| 1540 | | | | | 5.28 | | 6.67 | 5 | 8 | 9.36 | | |
| 1550 | 7.5 | | | 5.06 | 4.71 | 6.83 | 5.85 | 8.75 | 7.76 | 9.15 | | |
| 1560 | 7.5 | | | | 5.25 | 8.33 | 5.84 | 5.5 | 7.3 | 8.95 | 7.07 | 10.5 |
| 1570 | 7.5 | | | | 4.88 | 8.33 | | | 6.8 | 8.67 | 7.1 | |
| 1580 | 6.5 | | | | 4.9 | | | | 6.5 | 8.07 | 7 | |
| 1590 | 6.5 | | | | 5 | | | | 6.66 | 7.67 | 6.86 | |
| 1600 | | | | | 5.3 | | 6.67 | | 6 | 7 | 6 | |
| 1610 | | | | | 4.97 | 8 | | | 6 | | 6 | |
| 1620 | | | | | 5.06 | 7.2 | | | 5.1 | | 6 | |
| 1630 | | | | | 5.19 | | | | 5 | | | 3.75 |
| 1640 | | | | | 4.88 | 6.67 | | | 4.7 | | | 3.75 |
| 1650 | | | | | 4.78 | 7.67 | | | 6.18 | | 4 | 5.5 |
| 1660 | | | | | 4.6 | 6.61 | | | 4.58 | 5.8 | | 5.5 |
| 1670 | 5.5 | | | | 5 | 6.38 | | | 4 | 6.1 | | 3.75 |
| 1680 | 5.5 | | | | 4.67 | 5 | | | 4 | 4.2 | 3 | 4.72 |
| 1690 | 5.5 | | | | 5 | | | | 4 | 3.7 | | 5 |
| 1700 | 5.8 | 4.5 | | | 5 | | | | 3.5 | 4.9 | | 5.1 |
| 1710 | 6.33 | 4.5 | | | 5 | | | | | 5.5 | | 5 |
| 1720 | 5.5 | 4.5 | | | 5 | | | | | 5.3 | 1.93 | 2.46 |
| 1730 | 5.28 | 4.5 | | | 5.79 | | | | | 4.2 | 1.8 | |
| 1740 | 5.5 | 4.5 | | | 4.79 | | | | | 5 | 1.86 | 2.55 |
| 1750 | 4.66 | 4.5 | | | 4.1 | | | | | 5.3 | 1.8 | 5 |
| 1760 | 4.52 | 4.5 | 6.3 | | 4 | | | | | 4.8 | 1.86 | 3.12 |
| 1770 | 3.6 | 4.5 | 5.37 | | 4 | | | | | 4.8 | 1.8 | 1.85 |
| 1780 | 3.94 | 4.5 | 4.9 | | | | | | | 5.01 | 1.93 | 2 |
| 1790 | 3.4 | 4.5 | | | 3.67 | | | | | 5.4 | | |

| Year | Milan | Tuscany | Castile | B. Spain | Genoa | Venice | Barcelona | England | Holland | France | Poland | Russia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1500 | | | 10 | | 2.8 | 5 | | | 6.4 | | | |
| 1510 | | | 9.75 | | 3.2 | 5 | | | 6.25 | | | |
| 1520 | | | 9.25 | | 3.48 | 6.25 | | | 6.33 | 8.34 | | |
| 1530 | | | 8 | | 3.34 | 7.15 | | | 6 | 8.33 | | |
| 1540 | 8.2 | | 6.46 | | 3.31 | 5.15 | | 16.8 | 5.88 | 8.33 | | |
| 1550 | 9.72 | 12 | 6.52 | | 4 | 3.5 | 4.01 | 13.5 | 6.99 | | | |
| 1560 | 12.14 | 7 | 6.75 | | 4.38 | 6 | | | 6.58 | | | |
| 1570 | 9.94 | | 6.75 | | 3.4 | 7.9 | | | 10.15 | | | |
| 1580 | 8.92 | | 5.68 | | 3.06 | 5 | | | | | | |
| 1590 | 8.54 | 5 | 5.8 | | 3.41 | | | | 8.3 | 8.33 | | |
| 1600 | 7.29 | | | | 4.03 | 4 | | 10 | 7.79 | 6.46 | | |
| 1610 | 6.38 | 5 | | | 2.66 | 5 | | 10 | 6.25 | 6.25 | | |
| 1620 | 6.89 | 5 | 5 | | 3.6 | 5 | 4.5 | 8.8 | 6.25 | 6.25 | | |
| 1630 | 7.48 | 5 | 5 | | 3 | 5.4 | 4.5 | 8 | 5.54 | 5.92 | | |
| 1640 | 5 | 4.5 | | | 3.1 | 5.6 | 4.5 | 8 | 4.66 | | | |
| 1650 | 5.89 | | | | 3.01 | 6 | | | 4.28 | 14.5 | | |
| 1660 | 5.36 | | 6 | | 2.5 | 5.8 | | | 3.68 | 7.08 | | |
| 1670 | 5 | | | | 2.6 | 2.5 | | | 3.7 | 5.86 | | |
| 1680 | 4.81 | | 5 | | 2.3 | 2.5 | | | 3.79 | 6.2 | | |
| 1690 | 6.2 | | | | 2.5 | | | 7.89 | 3.74 | 6.48 | | |
| 1700 | 4 | 5 | | | 2.4 | 4.5 | | 6.73 | 3.61 | 6.48 | | |
| 1710 | 4 | 4.5 | | | | 5.8 | | 6.13 | 3.29 | 4.86 | | |
| 1720 | 3.93 | 4 | | | 3.11 | 3.61 | | 3.93 | 2.06 | | | |
| 1730 | 4 | 3 | | | 2.85 | 2.83 | | 3.03 | 1.78 | 5 | | |
| 1740 | 2.78 | 3.5 | | | 2.58 | 2.73 | | 3.36 | 1.68 | 5.99 | 4.8 | |
| 1750 | 2.75 | 3.25 | | | 2.85 | 2.68 | | 3.35 | 1.7 | 4.84 | 5.08 | |
| 1760 | 2.73 | 1.93 | | 6 | 3.16 | 2.66 | | 3.4 | 1.79 | 6.47 | | 5 |
| 1770 | 2.75 | 2.1 | | 6 | 3.2 | 2.1 | | 3.92 | 1.82 | 7.26 | | 5 |
| 1780 | 2.74 | 1.82 | | | 3.11 | 2.44 | | 4.18 | 2 | 5.87 | | 4.75 |
| 1790 | | | | | | 3.3 | | 4.04 | 1.7 | 5.67 | | 4.7 |

## APPENDIX C. SECONDARY SOURCES ON EUROPEAN PUBLIC INTEREST RATES

| | |
|---|---|
| Austria: | Dickson (1987) 402-404; Hildebrandt (1992) 74; Körner (1995) 532 and 536; Fynn-Paul (Van der Muelen Portfolio) 32-34; Stasavage (dataset). |
| Denmark: | Korner (1995) 536. |
| Germany: | Fryde and Fryde (1963) 512 and 523; Fynn-Paul (Van der Muelen Portfolio) 32-34. |
| Württemberg: | Tracy (1985) 19. |
| Basel: | Usher (1943) 161; Fryde and Fryde (1963) 550; Riley (1980) 164; Gilomen (2003) 132; Stasavage (dataset). |
| Bremen: | Albers (1930) 109-152; Stasavage (2011) 31; Stasavage (dataset). |
| Cologne: | Usher (1943) 171; Fryde and Fryde (1963) 547; Stasavage (dataset). |
| Dortmund: | Fryde and Fryde (1963) 532. |
| Geneva: | Bergier (1962) 119; Stasavage (dataset). |
| Hamburg: | Reincke (1953) 500; Stasavage (2011) 31; Stasavahe (dataset). |
| Mainz: | Fryde and Fryde (1963) 552. |
| Nuremberg: | Fryde and Fryde (1963) 548-549; Homer and Sylla (2005) 116; Stasavage (dataset). |
| Zurich: | Fryde and Fryde (1963) 551; Stasavage (dataset). |
| Bologna: | Carboni (1995) 131-132; Pezzolo (2012) 280. |
| Naples: | Felloni (1977) 22; Calabria (1991) 143-145, Pezzolo (1995) 313; Pezzolo (2012) 280; Stasavage (dataset). |
| Rome: | Felloni (1977) 22; Partner (1980) 26; Piola Caselli (1991) 466-467; Pezzolo (1995) 296-297; Pezollo (1994) 740; Stasavage (dataset). |
| Piedmont: | Stumpo (1988) 662; Felloni (1977) 22; Pezzolo (2012) 280; Stasavage (dataset). |
| Milan: | Cova (1991) 73, 73-76, 81-86, 108 and 344; Dent (1973) 330; Felloni (1977) 22; Pezzolo (2012) 280; Stasavage (dataset). |
| Tuscany: | Felloni (1977) 22; Körner (1995) 536; Pezzolo (2012) 280. |
| Aragon: | Fynn-Paul (2015) chapter 11. |
| Castile (Spain): | Usher (1943) 175; Ruiz-Martin (1975) 14; Mauro and Parker (1977) 49; Riley (1980) 111, 139 and 165; Stasavage (dataset). |
| Florence: | Pezzolo (2001); Pezzolo (2012) 280; Stasavage (dataset). |

| | |
|---|---|
| Genoa: | Day (1963) 25-26; Cipolla (1975) 269-270; Kedar (1976) 98; Felloni (1977) 22; Epstein (2000) 20-23; Pezzolo (2001); Pezzolo (2012) 280; Stasavage (dataset). |
| Siena: | Bowsky (1970) 193 and Appendix 13. |
| Venice: | Luzatto (1963) 26, 37, 54, 86 and 93; Felloni (1977) 22; Kellenbenz (1986) 334; Pezzolo (1990) 178; Pezzolo (1994) 738; Pezzolo (1995) 296; Pezzolo (2003) 65; Pezzolo (2012) 280; Stasavage (dataset). |
| Barcelona: | Usher (1943) 171; Stasavage (dataset). |
| England: | Ashton (1960) 155; Fryde and Fryde (1963) 456; Outhwaite (1966) 302; Kaeuper (1973) 118-124; Van der Wee (1977) 388; Kellenbenz (1986) 113; Homer and Sylla (2005) 129 and 153-160; Dickson (1967) 48-49, 60-61 and 63; Fynn-Paul (Van der Muelen Portfolio) 30-32; Stasavage (dataset). |
| Holland: | Houtzager (1950); Fryde and Fryde (1963) 532; Tracy (1985) 94; Fritschy (1988) 72; 't Hart (1999) 309-326; Fritschy (2003) 64; Zuiderduijn (2007) Appendix 9; Fritschy European State Finance Database (available at www.esfdb.org); Fynn-Paul (Van der Muelen Portfolio) 28-30; Stasavage (dataset). |
| Arras: | Bougard (1988) 61; Munro (2003) 525. |
| Bruges: | Fryde and Fryde (1963) 538; Van der Burg, Derycke and van der Heijden (2006) 9. |
| Douai: | Espinas (1902) 314-346; Usher (1943) 158; Munro (2003) 525. |
| Ghent: | Munro (2003) 534; Stasavage (dataset). |
| France: | Fryde and Fryde (1963) 483 and 488; Goubert (1970) 227; Van der Wee (1977) 379; Bonney (1981) 19, 318; Collins (1988) 47, 73, 86; Munro (2003); Homer and Sylla (2005) 120, 129, 167-169 and 170; Stasavage (dataset). |
| Poland: | Fynn-Paul (Van der Muelen Portfolio) 32-34. |
| Russia: | Riley (1980) 49; Homer and Sylla (2005) 598-599. |

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