DISCUSSION PAPER SERIES

DP13896

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ECONOMIC HISTORY

ISSN 0265-8003

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Discussion Paper DP13896
Published 28 July 2019
Submitted 24 July 2019

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Abstract

Many influential cliometric studies have examined historical interest rates in order to assess investment efficiency, the integration of markets, the economic effects of changes in policies or institutions, the sources of macroeconomic cycles, and so on. The common feature of this approach to economic history is that it is based on the crucial assumption that interest rates are the market prices at which demand meets supply. In this perspective, most debates focus on how to calculate yields or compare different rates of return on capital. Cliometricians developed innovative methods to construct yields and lending rates that were not specified in historical sources. It is only quite recently that economic historians have turned to cases where interest rates are not market-clearing prices. In such cases, there is little connection between interest rates and the state of the economy. Highlighting market imperfections, some recent studies have challenged earlier historical interpretations that overlooked the potential disconnection between prices (interest rates) and quantities. They offer new insights into the historical functioning of credit markets, central banking and government intervention in financial systems.

JEL Classification: N1, N2, E4

Keywords: interest rates, yield, central bank, usury law, market clearing (rationing)

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Acknowledgements
This survey paper is forthcoming in the Handbook of Cliometrics, volume II, edited by Claude Diebolt and Michael Haupert (Springer). I thank the editors for their encouragements and their detailed comments. This draft also benefited from comments by Cyril Milhaud, Pierre-Cyrille Hautcoeur and Pierre Sicsic.

Introduction

"The problem of interest has engaged the attention of writers for two thousand years, and of economists since economics began."[1] The first sentence of the famous book, *The Rate of Interest*, published in 1907 by the economist Irving Fischer, reminds us that the rate of interest is not a concept recently formalized and used by historians to examine past economic practices. Interest rates were mentioned, applied, registered, and negotiated from ancient to modern times (Homer & Sylla 2005). Their use and the debates that surrounded them involved religious, cultural, and legal considerations (usury law being the most noted example; see for example Hoffman, et al 2000; Botticini and Eckstein 2012). So quantitative economic historians are not the only historians interested in interest rates. Then, what makes the "cliometric" contribution to the study of interest rates specific?

Cliometricians have looked at interest rates as a market price in order either to infer some information about individual, collective or policy preferences, or to directly assess the efficiency of the economy. The reasons cliometricians have looked at interest rates, and the way they did it, is indeed much in line with what Deirdre McCloskey (1978 p.15) said about the general development of cliometrics: "Not counting but economic theory, especially the theory of price, is the defining skill of cliometricians, as for other economists". In light of price theory, interest rates are typically examined as an indicator of the integration of markets, the rationality of actors, their expectations, or the confidence in a corporation, a polity or a government. Some important

[1] Due to space limitations many important articles on the subject had to be left out. Therefore, this survey should not be seen as an attempt to fully discuss the most recent work on this issue. What I have tried to achieve is to present the widest possible variety of methods, to highlight the pioneering work of early cliometricians which have inspired many subsequent researchers, and to highlight and criticize the strong theoretical assumptions that were the basis for standard studies of interest rates by economic historians. Although an attempt has been made to paint a general picture of the work of cliometricians, this survey obviously reflects the author's biases and research interests.

contributions to economic history that will be presented in this survey used interest rates (either profit rates or market rates) and built on economic theory to challenge conventional history, claiming that the information previously gathered by historians was too scattered or subjective. In this perspective, the study of interest rates is seen as a means of inferring coherent and valuable information from the market, and it is considered superior to alternative methods based on limited qualitative sources, which may suffer from undergoing selection bias (Conrad and Meyer 1958, North and Weingast 1989, Rappoport and White 1993, Willard et al. 1996).

Various theories have been used to interpret interest rates. Neoclassical growth theory views the interest rate as the price that equates investment and saving and enables a productive allocation of factors. In microeconomic theory with rational agents but asymmetric information, the equilibrium interest reflects information problems. In financial theory (with perfect or imperfect information) the interest contains information about expectations. Building on Keynesian theory, the interest rate is the price that equals the demand and supply for money. Counting is not a minor issue, however. The reliance on theory, beliefs in market mechanisms, and the quest for historical market prices pushed quantitative economic historians to compute market yields that were not specified in contracts, and to construct returns on investment based on actual or expected earnings. This is done even when historians have no specific information on whether and how economic agents actually computed such returns. Thus, as recalled by Homer and Sylla (2005), many rates of interest used by quantitative economic historians were not nominal rates specified in contract. They are not interest rates that contemporaries saw as such. They are estimations based on assumptions. Many innovative methods were applied to calculate yields when there was no information on prices or interest rates (Conrad and Meyer 1958, Davis 1965, Sussman and Yafeh 2006). Such methods created – and still create – many debates on the potential limitations of such

computations and their underlying assumptions. As we will see in this chapter, this generated many controversies between cliometricians. Using historical interest rates led to provocative and fruitful research but, in some areas, little consensus has been reached on how to construct and interpret the level and movements of interest rates in light of price theory.

Much less debated in the cliometric literature have been cases where interest rates – found in historical archives or calculated ex post – cannot be used to infer information about behavior or markets, because rates were not market prices. The practice of usury rates in the early modern and modern period have received a lot of attention in the historical literature (Hoffman et al. 2000; Temin and Voth 2005; Botticini and Eckstein 2012). This tends to obscure the fact that usury laws still exist today in many countries (not only in those where a religious law prevails) and, more generally, that many interest rates have been determined by regulation, manipulated by market markers (governments or oligopolies), or that markets cleared through quantities rather than prices. One position would be to say that, given its methodological premises, the cliometric literature has nothing to learn from fixed, non-market-determined interest rates. A more nuanced view is that there is still much to be learned about the functioning of an economy if one understands why some interest rates were not market clearing prices. It is also a way to challenge earlier historical interpretations that overlooked the potential disconnection between prices (interest rates) and quantities (Hoffman et al. 2000, 2019; Temin and Voth 2005: Monnet 2014).

The rate of return on investment and the production function

A standard way to assess profitability, or yield, in finance is to calculate the internal rate of return. This is the rate at which the total present value of the investment cost equals the total present value of future earnings. In Keynes's terminology, the internal rate of return is called the marginal efficiency of capital. For investment to take place (or to be rational), this has to be higher than the

interest rate, that is the rate of return on a safe asset which can be purchased easily (i.e a market rate). In one of the first cliometric studies published in 1958, Conrad and Meyer (1958) calculated the rate of returns on slaves in order to assess whether slavery was a profitable activity. By reconstructing investment costs and earnings of a cotton plantation in the south of the United States, they found rates that were much higher than in other activities. The issues at stakes behind such calculations were enormous, and were further developed in Fogel and Engerman's landmark work, *Time on the Cross* (1974). If slavery in antebellum America was a profitable activity, then it meant that economic forces alone would not have brought slavery to an end without the necessity of war and political change.

Conrad and Meyer's study offers a prominent example of the new methods and questions, as well as new controversies, that the quantitative "new" economic history (or cliometrics) brought to history. As explained by Fogel and Engerman (1974, p.65 et al.), discussions on the profitability of slaves had been limited by the lack of sources on the matter before the study of Conrad and Meyer. Leaving aside the question of whether slave owners themselves were making profitability calculations, Conrad and Meyer decided that "the basic problems involved in determining profitability are analytically the same as those met in determining the returns from any other kind of capital investment".They moved away from the debate framed by the accounting concept of profitability and turned to a purely economic concept of profitability, based on theoretical reasoning rather than on historical accounting practices. They derived a rate of return from estimates of the cost (investment) of slaves and their lifetime earnings. Their approach was not limited to calculating the rate of return from the investment and revenues of a typical cotton plantation. They had to compare it to alternative interest rates in order to assess whether slavery was an "efficient business". Hence, they had to find alternative rates of interest (whether

commercial paper or investment in other activities) and, most of all, justify that such markets existed and were accessible to slave owners.

The underlying argument of Conrad and Meyer is that if an investment turns out to be profitable (in theory) but is not realized, it is because social or political constraints have prevented this investment. Agents are assumed to be sensitive to market incentives and interest rates are assumed to be the price at which supply and demand meet. Then, if slavery disappeared despite being profitable, it was because of political choices. The calculations and comparisons of rates of return were, for these authors, a way to understand the determinants of historical changes. In a totally different context but in a similar perspective, Jean-Laurent Rosenthal (1990) applied the same method to examine the economic consequences of the French revolution. He calculated the rate of return of irrigation (building a canal) in Provence and found similar values before and after the Revolution, whereas the construction of a canal started only after 1789. From this comparison of hypothetical interest rates based on financial theory, he stated that canals were not built before the revolution because political institutions prevented the transfer of property rights.

In a follow-up to Conrad and Meyer's (1958) article, Sutch (1965) described the method of the previous authors as "reconstructing the production function" of the cotton plantation. It means that the authors had to use historical sources to come up with detailed estimates of the cost of investment, as well as lifetime earnings. However, the method of calculating internal rates of return does not require the specification of a full-fledged production function formalizing how factors are combined to produce output. On the contrary, other economic historians have relied explicitly on a neoclassical production function to shed light on the relationship between the rate of return and the factors of production. The objective was not to compute an internal rate of interest based on the present value of cash flows, but to express the marginal rate of return on capital, based on a

production function. The theory underlying the interpretation of interest rates is thus different, although the terminology is sometimes quite similar. A typical way to proceed in this way is to take a market interest rate as given and assume that it equals the marginal return on capital in order to infer some information about the factors in the production function. In an influential but controversial paper, Peter Temin (1966) used such a method to assess whether labor scarcity (and hence high real wage compared to the UK) was prevalent in the 19th century US economy. Temin observed that market interest rates (yields on government bonds) were higher in the United States than in the United Kingdom. From this observation, making the assumption that market forces should equate different interest rates within a country, he concluded that rates of return in American manufacturing were higher than in British manufacturing. Since the rate of return of a neoclassical production function is positively related to the labor-capital ratio, Temin concluded that labor was more abundant in the US and capital scarcer. One key assumption of Temin's result was that technologies were similar in the US and UK, so that labor and capital were used in the same way to produce manufacturing goods. Even if one is ready to accept this assumption, Fogel (1967) and Drummond (1967) showed that a higher interest rate in the US is still compatible with a lower labor to capital ratio in this country, if one consider different factor prices or include land in the production functions. In Fogel's words, there was a specification problem in Temin's work: a single empirical observation was compatible with several theories. Moreover, the implicit assumption that two countries have reached their steady state is debatable.

The method of Conrad and Meyer (1958) was to calculate the internal rate of return based on estimations of capital and labor used for production, and then to compare this return to a market interest rate in order to assess efficiency. Temin's method, on the contrary, was to use the neoclassical theory of economic growth to make a statement about the relative importance of

production factors, based on the observation of empirical interest rates. While no method is perfect, since they all rely on a specific set of important assumptions, the second method is more prone to a specification or identification problem (i.e. several theoretical formulations are consistent with one empirical observation), as underlined by Fogel.

Theoretical and effective interest rates

Critics of Temin's article raised an interesting question as whether market interest rates on financial assets are good proxies for the return to capital in the standard neoclassical model. Many pieces of evidence point to large discrepancies between yields on financial assets and the rate to capital that may correspond to the standard neoclassical model (Mulligan 2002). For this reason, some authors dealing with macroeconomic historical questions, like Allen (2009) and Piketty (2014), have preferred to compute profit rates from wealth estimates rather than use market interest rates in order to interpret historical economic evolution in light of growth theory.

Dealing with a more recent period, Caselli and Feyrer (2007) calculate the profit rate (marginal product of capital) for a panel of countries based on estimates of total income and the capital stock. They explain that comparing market interest rates at the international level is not informative and problematic "because in financially repressed/distorted economies, interest rates on financial assets may be very poor proxies for the cost of capital actually borne by firms" (p. 536). Many economic historians had already warned us not to interpret historically observed (real) market rates as the rate of return on capital in neoclassical growth theory (Harley 1977). Moreover, Harley's contribution to the debates around the Gibson paradox in 19th century Britain (i.e the unexpected correlation between interest rates and the price level, rather than the rate of inflation) recalled that the assumed positive relationship between nominal interest rates and the rate of

inflation is not warranted. This cast doubts on the relationship that economists usually expect between nominal and real variables.

Barsky and Summers (1988 proposed to solve the Gibson paradox by claiming that during the gold standard, the real interest rate was in fact determined by the relative price of gold. Since the writings of Keynes, the Gibson paradox has been seen as a prominent example showing that taking for granted some standard assumptions of economic theory about interest rates may lead to biased interpretations. It has been argued instead that economic theory should not be taken as a basis for interpretation, but should be refined to provide predictions that are consistent with the historical evolution of interest rates. More generally, there are many monetary, financial or institutional factors that may explain the differences between the observed real rate of return on financial assets and the return to capital derived from a standard neoclassical production function in an environment of perfect capital mobility. Some recent estimates of return on real and financial assets show that they often substantially differ (Jorda et al. 2017). It is therefore an open question as to whether the rates of return on financial assets can be interpreted in the light of neoclassical growth theory, and it is fair to say that no consensus has been reached by economic historians on this issue.

In their standard history of interest rates, Homer and Sylla (2005, p. 10) acknowledged the lack of agreement on the matter: “It is not the purpose of this book to analyze the causes of interest-rate levels and trends. There is a vast literature on this subject but little area of agreement.” Partly for this reason, we shall see in the next sections that much of the cliometric literature has not focused on explaining the level of long-term interest rates, but has been interested in explaining the short- or medium-term variations of these rates (or differences in rates) with the aim of clarifying historical market characteristics or agents' reactions to political or economic changes.

Building new theories to explain the historical evolution of interest rates in the long run has not been the main objective of cliometricians. Consistent with McCloskey's (1978) principles, they are more inclined to use available standard interest rate theories to shed light on historical episodes.

Market interest rates: sources and calculation methodsAt first sight, it may seem much easier to calculate a market interest rate than the internal rate of return or the marginal rate of capital. Computations of the internal rate of return and the profit rate rely on sometimes-crude estimates of the values of investment, future earnings or production factors. On the contrary, the market gives us a direct estimate of the value of an asset at a given time. The current yield is simply equal to the investment's annual income (interest, coupon or dividends) divided by the current price of the security, as quoted on the market. It would be wrong, however, to think that this computation is an easy task. All textbooks in investment finance contain endless pages on how to calculate yields, depending on the assumption that are made on whether the bond is held towards maturity, whether investment returns are compounded, etc. In their introduction, Homer and Sylla (2005) give key definitions and highlight important pitfalls in the calculus of market interest rates. Many economic historians have formulated similar reflections, including Klovland (1994) in an important paper about the yield on British consols in the 19th century. Since the interest rates used by historians are often yields on government bonds (the yield on British consols being a prominent example) because these assets were traded continuously for a long time, debates on the methods to calculate the yields have received a lot of attention in the literature, and the pitfalls should be known to users. A conceptual clarification is first necessary. A distinction has to be made between what Homer and Sylla call the "nominal interest rate", that is the rate specified in the loan contract (the interest expressed as a percentage of the nominal, face, or par value of the loan) and the "market yield," which is the rate of return to the buyer at the market price. It is impossible to enter here into all

details and pitfalls of the calculation of yield. However, it is enough to emphasize just how sensitive yield calculations are to the seemingly minor institutional details of price quotation and to assumptions about the date of redemption of the bonds (Klovland 1994).

The computation of average market yields relies on a chosen set of bonds. Issues of averaging and the choice of relevant bonds arise, creating considerable discussions for both market investors and historians (Homer and Sylla 2005). Short-term interest rates on government bills do not face the same issues of redemption as do long-term interest rates. However, there are still issues regarding the choice of the quoted purchase price of the bill as well as the best method to calculate the yield. We have mentioned earlier formulas to calculate yields on long-term bonds that offer a coupon, but many short-term bills do not. Such bills, like US treasury bills, are issued at a discount from par value. For such cases it is debatable whether to use the discount yield formula [((par value - purchase price) /par value) * 360/days to maturity)] or the investment yield method [((par value - purchase price) /purchase price) * 360/days to maturity)]. For all these methods to be reliable, the market needs to be sufficiently liquid for prices to be quoted with regular frequency. This is why we have so few long run yield series. The exceptions are government securities in major countries with a stable government and well-developed financial markets since the 19th century.. Thus, the available long-term series of interest rates on financial assets have a strong selection bias (Homer and Sylla 2005, Jorda et al. 2017): they exist only when financial markets were sufficiently developed and liquid. Little is known about lending practices and contracts in less developed markets.

Money market (interbank) rates are another type of animal. Since the interbank market is an over-the-counter market, there is no quoted price. The rates at which funds were borrowed are known from declarations of market participants, as for the LIBOR (London Inter-bank Offered

Rate) today. For historians using such rates, it is not always easy to identify the types of assets that were traded on the market and the actors involved. For example, the widely used interest rates published by the British newspaper, the *Economist,* in the 19th century was limited to a premium market whose conditions were presumably different from most credit conditions in the country (Bazot et al. 2016). The recent dataset of Mitchener and Weidenmier (2015) reminds us that short-term interest rates (either government bills or interbank markets) are available for few countries in the late 19th century, despite the period being quite integrated with developed capital markets worldwide. For lack of a better alternative, the discount rate of the central bank is often used as the best proxy for short-term interest ratesbut this is hardly a market price. Few sources provide a call money or a repo rate (Ungaro 2018).

Long term series of bank lending (or deposit) rates do not exist. This is simply because very few countries had banking regulation before the interwar period, so that no central authority collected and registered the interest rates applied by banks. Banks themselves did not make public a series of their average interest rates. Even in the US – which is a notable exception because banking regulation existed as early as the 19th century, meaning that banks had to send their balance sheets to the regulator – such data do not exist before the second half of the 20th century. Yet, armed with unique bank balance sheet data that have no equivalent anywhere in the world, US scholars have been able to compute proxies of interest rates for the postbellum era by dividing bank earnings by their stock of earning assets (Davis 1965). In other countries, such as England, estimates of bank lending rates have often been based on few case studies (see Temin and Voth 2005 for a review).

Market integration and market risk: differences between rates in several areas

Collecting and estimating interest rates is not an easy task. But this hard work often generated landmark studies that shed a new light on historical debates. An influential study in this area was the article by Lance Davis (1965), which estimated regional interest rates for the United States from 1870 to 1914 and showed a striking and persistent divergence between these rates until the war. Evidence of such low integration in US capital markets led to countless studies trying to understand why it was the case and how growth could occur despite low integration (see Landon-Lane and Rockoff 2007 for a review).

Many authors have looked at interest rates differentials in order to study the integration of national or international capital markets. At the international level, spreads between market interest rates (when available) or estimations of profit rates (marginal return to capital) have also been used as a measurement of financial integration and its evolution over time (e.g. Obstfeld and Taylor 2004, Flandreau et al. 2009, Caselli and Feyrer 2007).

One problem with comparing interest rates or average returns between different geographical areas is that it not always possible to compare interest rates on assets with the same risk, as Eichengreen (1984) showed in his study of mortgage lending in the United States. And when this is possible, it is not always enough to assess financial integration. McCloskey (1970) underlies the fact that British rates on safe bonds (railway or government) were close to rates abroad with the same risk, but overall, the average rate of return perceived by British investors on British assets in 1911-1913 was twice as high as the return on capital abroad. McCloskey recalls that contemporaries had already noted such discrepancy and had not interpreted it as the result of a bias towards safer assets abroad, but as a deliberate policy of the financiers of the City of London to favor foreign capital

and maintain high rates in the country. She quotes J.M Keynes writing that the effect London's investment policy was "to starve home developments by diverting savings abroad and, consequently, to burden home borrowers with a higher rate of interest than they would need to pay otherwise" (McCloskey 1970, p.452). McCloskey assumes that the maximum spread between foreign and domestic rates of return could be a measure of market imperfection created by the City of London. She calculates whether, in this case, British national income could have been much higher without such an imperfection. She finds that, had imperfections been smaller, the growth of British national income would not have been much higher. Thus, she refuted the argument that slow growth in Britain during the Victorian era could be attributed to the outflows of capital to other countries.

Besides assessing whether capital markets were efficient and estimating the degree of integration, differences between interest rates of several countries have also been used to discuss the autonomy of domestic monetary policy relative to the world. Full integration of international financial markets would mean that countries have no ability to set their interest rates independently from others. As is the case with regional interest rates, there were in fact differences in worldwide interest rates, either because of voluntary or involuntary capital market imperfections. Economic historians are interested in understanding what these differences reveal about the geopolitics of finance. Morys (2013) showed that the discount rates of central banks in Eastern Europe under the gold standard were influenced by discount rates in Berlin and London to a similar degree. This finding suggests that the functioning of the gold standard was less London-centered than had been hitherto assumed, and that Germany was the policy reference for most countries in the "periphery". Obstfeld and Taylor (2004) interpreted the spreads between the domestic interest rates and an index of several leading international rates as a measure of the constraint of international finance (the

"trilemma"). A high spread is evidence of higher autonomy. They looked at how this autonomy varied over time and depended on the international monetary regime.

An influential study by Bordo and Rockoff (1996) looked at the spread between the domestic long term interest rate in several countries and the British rate during the gold standard. They showed that gold standard adherence lowered the spread between domestic and British rates, and they interpreted this finding as evidence that the gold standard was a signal of financial rectitude, a "good housekeeping seal of approval," that facilitated access by peripheral countries to capital from the core countries of Western Europe. A large literature followed from this article (enlarging the sample of countries and using different definitions of interest rates) whose common point has been to discuss the potential benefits of gold standard adherence by looking at spreads between the domestic interest rate and the leading international rate (see Alquist and Chabot 2011, Mitchener and Weidenmier 2015 and Chavaz and Flandreau 2017 for recent additions and a literature review). Bordo and Rockoff's argument was international in nature but was influenced by neo-institutionalist theory that discussed how a change in institutional settings (the gold standard in this case) affected the cost of government borrowing by creating a credible commitment to financial and fiscal rectitude ("good housekeeping seal of approval" in this case). The landmark paper in this literature was North and Weingast (1989), to which we now turn our attention.

Interest rates and political regimes

In a controversial and groundbreaking paper, North and Weingast (1989) famously claimed that the new institutional setting arising from the 1688 revolution in England allowed the government to commit credibly to upholding property rights and that this made the financing of the public debt cheaper and contributed to the development of private markets as well. They used interest rates (on

public debt) as a way to assess the influence of institutions on the government's ability to borrow, and to discuss the benefit of institutional reforms.

Few historians stillaccept the conclusions of North and Weingast(Coffman et al. 2013), but the paper remains influential in shaping a new approach to examining interest rates and interpreting them in the light of neo-institutional theory. The North and Weingast thesis was attacked for many reasons. Some argued that there was no evidence that the 1688 revolution guaranteed property rights and that it was mainly because of the parallel development of financial markets that sovereign debt became a safe and liquid investment vehicle with a low interest rate (Coffman et al. 2013). Others went on to build new interest rate series to challenge North and Weingast's conclusions about a decline in government bond yields after the 1688 revolution (Sussman and Yafeh 2006).

There was no high frequency listed price of government bonds for this period, so the estimates rely on fragmentary data. To overcome this limitation, Sussman and Yafeh (2006) calculated the cost of British government debt as the ratio of debt service payments to total government debt (dividing government debt service expenditures by a series of the stock of total debt).They found that the interest rate on British debt remained high for several decades after the 1688 revolution, especially in relation to the Dutch interest rate. Based on various sources from private financial institutions, several other authors have also found no change in interest rates after the revolution (see Temin and Voth 2005, and Coffman et al. 2013 for a review).

Not all economic historians share the neo-institutionalist perspective of North and Weingast on the link between the cost of sovereign debt and the "quality" of institutions. But, it has become a common practice to look at changes in interest rates to interpret the effects of political events. Willard, et al (1996) look at the Greenback market during the US civil war and use econometric

techniques to identify breaks in the price. The United States issued an inconvertible currency called the Greenback starting in 1862. Its value in gold fluctuated over time, reflecting the expectation of future war costs. The authors use data on the gold price of Greenbacks and compare the reactions of participants in financial markets to significant military events during the Civil War. Their findings highlight the importance of some events (especially expectations of victories and end of the war) that had not been viewed as crucial by historians, but seemed to have created major changes in the expectations of contemporaries.

Ferguson (2006) studied the behavior of interest rates of long-term bonds quoted in London between 1848 and 1914 and found that political events had a much smaller affect on the bond market after 1880. He interpreted this result as the consequence of the deepening of national and international financial markets in the late 19th century. Most of all, he showed that the outbreak of the First World War was not anticipated by the market. He used this result to challenge the traditional view, which tended to over-determine the beginning of the war.

In a similar vein, Hautcoeur and Sicsic (1999) examined the interest rate of French and foreign bonds in interwar France to shed new light on the monetary unrest and political troubles of this period. They showed that two types of information can be extracted from interest rates: expectations of taxation (a capital levy should lead to a drop in the price of taxed capital assets) and expectations of a devaluation (through the price of long-term bonds whose coupons were indexed on the pound/franc exchange rate). Expanding the work of Klovland (1994), they also emphasize the role of the political context and the importance of assumptions on the risk of redemption and conversion to provide meaningful calculus of the interest rate on perpetual bonds.

These three papers made different uses of interest rate series and discussed in a different way the potential limitations of the calculus of interest rates, but they shared the premise that expectations of major political events are reflected in market prices. Looking at interest rates in this way is a novel method of assessing what contemporaries really thought about the likelihood and importance of political events. This method is more precise than looking at other sources – such as the press or parliamentary debates – which are difficult to exploit in a comprehensive way. Since the interpretation relies crucially on the assumption of efficient markets, the articles quoted above devoted a lot of attention to justify that the market they were looking at was efficient, in the sense that they were liquid and without barriers to entry.

Interest rates, financial and macroeconomic cycles

The link between politics and interest rates has not just been studied through the lens of institutions and expectations. The interest rate is a key variable in any macroeconomic model and, as such, deserves attention to understand macroeconomic fluctuations and their mechanisms. It is standard for macroeconomists to look at whether interest rates respond to economic shocks in a way which is consistent with theory and to model monetary shocks as an increase in the interest rate. These common questions and methods have been applied to historical data to inform both economic modeling and our understanding of the past. Robert Barro (1987) studied the response of interest rates to changes in government spending in 19th century England. His main motivation was to test for Ricardian equivalence, which predicts that an increase in public debt will be matched by a higher present value of future taxes, and thereby has no effect on desired national saving or interest rates. Barro's results show that interest rates rose after increases in spending only during wars, but not during the few episodes where budget deficits were caused by other reasons (compensation payments to slave-owners in 1835-36 and political disputes over the income tax in 1909-1910).

During the gold standard, there was no relationship between monetary growth and changes in government spending.

Economic historians have also used the econometric methods of macroeconomists and references to theory to study the impact of central bank decisions on the economy ("monetary policy shocks"). Monnet (2014), Bazot et al. (2016) and Lennard (2018), for example, applied standard VAR (vector autoregressions) to assess the impact of changes in the central bank discount rate during periods whose institutional features of central banking were very different from what we know today. One advantage of these methodsis to provide an estimation of the share of variance of main macroeconomic or financial variables, which is explained by changes in the discount rate of the central bank.

The use of recent econometric techniques has helped economists and economic historians to better understand the channels of transmission of main fluctuations and to assess the importance and impact of policy choices in these fluctuations. Although short or medium-term macroeconomic cycles have attracted much attention, seasonal variations have not been left aside. As with many variables reflecting economic activity, interest rates are often seasonal. Seasonality was particularly strong when agriculture accounted for a large share of national income and credit increased during the storage period of crops. This well-known pattern has been the topic of numerous studies (Homer & Sylla 2005). It was also recognized by contemporaries and, in some cases, generated policy interventions of governments or central banks, whose objective was to smooth and harmonize rates within a country (Miron 1986, Bazot et al. 2016). Miron (1986) shows that the size of the seasonal movements in nominal interest rates declined substantially after the US central bank – the Federal Reserve System – was established during World War I. The Fed conducted seasonal open market policy to eliminate the seasonality in interest rates. These Fed operations not only mitigated the

seasonality in interest rates, but also the frequency of financial panics, which were themselves partly caused by the seasonality of interest rates. Bazot et al. (2016) pointed out that the Bank of France – the French central bank – was smoothing seasonal fluctuations in the interbank market. In addition, they provided evidence that central bank interventions were partly absorbing the effects of international financial shocks on the French money market rate.

The link between interest rates and financial panics has also been the topic of considerable interest. One key question is whether cheap credit or loose credit conditions – reflected in interest rates – caused a financial bubble and then a crash. In a paper entitled "Was There a Bubble in the 1929 Stock Market?", Rappoport and White (1993) used interest rates as a test to answer this question. They look at interest rates for brokers' loans, which investors used to fund stock purchases. During the 1928 - 1929 stock market boom, lenders required a large premium in this market (over other money market rates) because they thought that stock prices might collapse during the term of a loan and jeopardize the collateral. They interpret this finding as evidence of a bubble in the stock market at this time, which was in fact expected by some market investors.

At first sight, the studies on interest rates and the macroeconomy may seem somewhat more agnostic about the efficiency of financial markets than the studies which merely aim to extract relevant information from market prices. Yet, the macroeconomic studies still assume that interest rates are prices that clear markets and, thus, that they reflect changes in demand and supply. When they do not share the neoclassical view of interest rates as the price that equals savings and investment, they at least subscribe to Keynesian principles that interest rates reflect demand and supply for liquidity. Such an assumption is usually made about the central bank leading interest rate, so that the central bank would move the quantities necessary to reach the target rate, and agents would adjust their behavior to that rate. These assumptions may be valid in some contexts,

but certainly not at any time and anywhere. Thus, to avoid unduly narrowing their field of study, economic historians have had to deal with situations where interest rates provide little information on the functioning of the economy. The last part of the survey is devoted to research in this area.

When interest rates do not clear markets

Hoffman, et al. (2000) chose a highly revealing title for their groundbreaking study of private credit markets in Paris over two centuries (mid-17th to mid-19th centuries): *priceless markets*. The title follows from the finding that client-specific information – and thus quantity rationing – was far more important than price in clearing the credit market. Interest rates did little to allocate capital or inform participants in the credit market. Such findings were based on a wide sample of private and public loan contracts taken from Parisian notarial records. The study was then extended at the national level in Hoffman et al. (2019). Notaries were the most important financial intermediaries during this period. Loans were usually granted at a rather similar rate, whatever the maturity and the risk. But willingness to lend and non-price conditions of the loans reflected characteristics of the borrowers. Although usury laws (until the French revolution) and later on, interest rate regulations, were an incentive to keep stable interest rates, the authors argue that the practices of notaries and the informational structure of the market mainly explain the insignificance of interest rates. This conclusion about the unimportance of interest rates for financial markets was based on microeconomic evidence and a detailed study of the market infrastructure, and bears important consequences for macroeconomic or political economy analyses. It means that we only observe a stable interest rate, from which it is impossible to infer information about demand and supply. Hence, there is no single average interest rate that could be interpreted as the price of capital in the economy, andthere is no interest rate differential that could be interpreted as evidence of borrower

selection or imperfect capital integration. Was there a price – any other interest rate – to which we can relate the amounts of credit observed on the Parisian credit market? Could we say, for example, that notarized loans were not offset by interest rates, but that a market interest rate from other financial transactions was nevertheless a good indicator of credit conditions in the private credit market mediated by notaries? The authors say no. They examined the available short-term and long-term government bond yields over this period and concluded that "it is remarkable how little a connection there was between interest rates and the state of the economy" and "following the variations of either the long or short-term interest rate series is thus unlikely to tell us much about the scarcity of credit except when the scarcity is driven by politics" (Hoffman, et al 2000, p.43).

The unimportance of interest rates was not specific to French notaries. Temin and Voth (2005) challenge the premise of the debate that followed North and Weingast (1989) (see supra) by claiming that interest rates in 17th and 18th century England were not indicative of credit conditions. Not only did Temin and Voth (2005) address the debate on the cost of financing after the 1688 revolution, but they also joined in the discussion of crowding-out during the British Industrial Revolution. A common explanation for slow growth during the 18th and 19th centuries is that wartime financing crowded out private investment, which should have translated into higher interest rates in wartime. Temin and Voth (2005) first review the work of previous scholars and conclude that, in both debates (effects of the 1688 institutional change, and crowding-out), evidence based on interest rates has been scarce and contradictory. According to them, using interest rates to solve these debates is illusory because "private-sector interest rates are not the right indicator of scarcity in the case of 18th-century finance – for both practical and conceptual reasons. In contrast to good markets, where price is an efficient way of allocating scarce goods, credit markets rarely reach equilibrium through changes in interest rates alone" (Temin and Voth 2005,p.

326). Rationing occurred because of usury laws and because of asymmetric information, which pushed financial intermediaries to discriminate by means other than interest rates. Borrowers willing to pay very high interest rates were inherently bad risks, so banks needed to find other margins on which to allocate credit. Based on the analysis of one English bank (Hoare's bank) whose balance sheets and archives have been kept, the authors show that 92% of all loans were made against interest at the usury limit. In such conditions, a negative shock to the private credit market (such as the issuance of government debt, which reduced bank deposits and the ability of banks to lend) was not reflected in higher interest rates.

Non-market clearing interest rates are not specific to usury laws of early modern Europe. It has been typical of government interventions to attempt to smooth fluctuations of interest rates and maintain them at a low and stable level. This can be accomplished either by regulation or financial markets interventions that manipulate the level of market interest rates. Such policies can achieve several objectives, such as providing a low cost of financing for the government (Reinhart and Sbrancia 2015), harmonizing interest rates across the country, allowing individuals to borrow at cheap rates, or protecting savings against inflation. The central bank is likely to play an important role in maintaining low and stable interest rates in a way that differs from what would have been the market outcome (Miron 1986, Bazot et al. 2016).

In economies with high financial regulation and capital controls – which have been widespread throughout the 20th century, including in non-communist countries (Reinhart and Sbrancia 2015) – the central bank typically maintains stable interest rates and use quantitative rationing (credit controls, reserve requirements, etc.) to fight inflation. Studying monetary policy in postwar France (1945-1973), Monnet (2014) showed that the discount rate of the central bank provides a misleading indicator of the stance of monetary policy. The French central bank did not move

interest rates. Rather, they usually relied on credit ceilings (limits on bank credit growth) to limit credit creation and curb inflation. Such central banking practices took place in a planned economy with segmented credit markets where many sectors benefited from subsidized loans, such that interest rates were not market clearing prices. It was also consistent with the objective of the government to maintain low and stable interest rates. The use of quantitative credit controls led to a disconnection between the level of interest rates and the overall monetary policy stance (or credit conditions).

Since many interest rates were regulated and credit markets were segmented, a tight credit policy did not lead to higher market interest rates. Hence, looking at interest to assess the impact of monetary policy leads to a mismeasurement of the policy stance and misleading results. Acknowledging such central bank strategies is also crucial to interpret gaps between interest rates at the international level. Central banks could assign the interest rate to the external side while managing domestic credit expansion with direct quantitative controls. As a result, a low spread between national interest rates cannot be interpreted as a lack of autonomy of monetary policy (Monnet 2018). The method of Obstfeld and Taylor (2004), which looks at interest rate differentials across countries to assess the autonomy of domestic policy, is only valid when the interest rats is the main policy instrument on the domestic side. There is much historical evidence that over the long run this was not always the norm, especially outside of the UK and the US.

The various studies mentioned in this section criticize the common use of interest rates by economic historians. They point out that either because of imperfect information, government policies, or institutional rules and norms, interest rates were rarely revealing anything other than market imperfections. They were not a market clearing price. If this is the case, interest rates cannot be used to assess market integration, the autonomy of domestic policy, the impact of institutional

reforms, etc. Earlier, I quoted the work of economists (Caselli and Feyrer 2007) who decided to estimate the marginal return to capital in order to assess the efficiency of capital allocation at the international level, because market interest rates were deemed imperfect indicators of actual credit conditions. “Because in financially repressed/distorted economies, interest rates on financial assets may be very poor proxies for the cost of capital actually borne by firms” (Caselli and Feyrer 2007, p.536).

What economic history has recently shown, is that repression and financial distortions were indeed so prevalent in the past – and still are today in many countries – that one should be very cautious in drawing conclusions about market returns or interest rates set by financial intermediaries, governments, or central banks. However, these conclusions are not all negative. Assessing the unimportance of interest rates provides important historical information on how markets functioned and how government interventions took place in the past. It also pushes researchers to develop innovative ways of circumventing the absence of significant changes in interest rates. However, since it is no longer possible to infer market information from a single price, researchers must look for data on quantities. Such work is often much more data intensive and time consuming (Hoffman et al. 2000, 2019; Temin and Voth 2005, Monnet 2014).

Conclusion

From Conrad and Meyer's (1958) study on the rate of return of slaves, to Davis (1965) on the integration of financial markets in the United States, to North and Weingast (1989) on the 1688 revolution in England, interest rates have been central to some of the most influential cliometric studies. As McCloskey (1978) points out, the theory of price was the defining skill of early

cliometricians. The interpretation of historical interest rates on the basis of standard price theory has been a constituent element of cliometrics. This method was widely and provocatively applied in order to attack traditional history, arguing that the sources of earlier work had been too scattered and biased to provide sound economic conclusions. Considering the interest rate as a market price was one way to draw more rigorous conclusions from sometimes-spartan historical sources. Since cliometric studies were – and still are, to a large extent –focused on the United Kingdom and the United States in the modern period, the assumptions underlying standard price theory were often seen as valid. The yield on British consols has probably been the most observed series of interest rates in history and epitomizes what is a market price in well-developed financial markets.

Cliometric studies of the rate of interest have not been without criticism. Questions were raised about the most relevant interest rate to consider, how to calculate yields on financial assets, and how to relate observed prices to the neoclassical theory of growth, which Fogel (1967) saw as a prime example of the specification problem in economic history. It is only quite recentlythat some studies have begun to discuss non market-clearing interest rates and incorporate them into a quantitative perspective of economic history. The common feature of these various studies is that they declare that some significant historical interest rates cannot be interpreted as market prices. It is therefore not possible to obtain precise information on preferences, demand, and supply from interest rates. Therefore, it is necessary to go beyond interest rates and accumulate data and information on quantities, since markets did not clear through prices. Some of these studies directly question the earlier results of cliometricians, such as the possibility of assessing the impact of institutional changes on financial markets (Temin and Voth, 2005) or of measuring monetary policy autonomy by examining the gap between national and international rates (Monnet, 2018). Yet their main message is not to get rid of price theory and interest rates in economic history. Some interest

rates were undoubtedly market prices that can be considered as such, but, in the end, they could be exceptions rather than a rule. Looking at how interest rates were set by private actors and governments out of the market – and what were the economic effects of such manipulation – is an area of further research.

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