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Contesting the Indigenous Development of "Chinese Double-entry Bookkeeping" and its Significance in China's Economic Institutions and Business Organization before c.1850

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Contesting the Indigenous Development of "Chinese Double-entry Bookkeeping" and its Significance in China's Economic Institutions and Business Organization before c.1850

Keith Hoskin[1] and Richard Macve[2]

Abstract*

The recent rapid growth of China's economy has reopened historical debate about the extent to which it prospered during the Míng and Qīng dynasties (1368-1911) through developing a significant market orientation on the base of its underlying agricultural bureaucratic feudalism. As a contribution to this debate, we question here the extent to which there is justification for claims concerning the development of a concomitant and indigenous Chinese form of double-entry bookkeeping (CDEB)—seen as having developed among bankers, merchants and proto-industrialists—and for its significance within such a market economy. Given that discussion on post-medieval European accounting history indicates that there is not necessarily a direct and positive connection between the development of Italian double-entry bookkeeping (DEB) and associated practices of entity accounting, and the development from the sixteenth century of Western capitalism, we argue that caution should be exercised in drawing any analogous connection in the Chinese context. But equally we wish to raise a more foundational issue concerning the similarities and differences between the knowledge worlds within which DEB and CDEB emerged, as a means to better reading the specific historical practices and discourses of each. We therefore review the invention and dissemination of western DEB as a technology emerging within a textually and semiotically changing knowledge world in the Latin West from the twelfth century AD, and consider how the evidence for the development and use of CDEB may then be reviewed in the context of the Chinese knowledge world. As part of such a reading, we focus on tracing possible intercultural linkages between the Western and Chinese developments across the fifteenth to nineteenth centuries. In this way we seek to problematise conventional

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formulations of the respective significance of both DEB and CDEB, while acknowledging that, at the current moment of such transcultural historical study, the mechanisms of translation and diffusion of practices and discourses generally remain obscure and inconclusive until the era of the transformation of China's modern economy in recent decades. There remains a clear need for further research utilising primary archival sources to test the arguments developed in the existing research literatures, and here.

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Keywords: *Chinese accounting; double-entry; Sombart thesis; intercultural translation; mercantile capitalism*

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http://www.lse.ac.uk/collections/accounting/facultyAndStaff/profiles/macve.htm

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1. Introduction

The recent rapid growth of the Chinese economy has reopened historical debate about how prosperous was the Chinese economy before the clear arrival of Western influences, from industrial Europe and the US, in the later 19th Century. The view that it is only since some point in the later 18th / early 19th century that Europe and China have diverged into essentially separate pathways of economic development, lasting until the transformation of the last three decades, is now dominant, albeit that the reasons are contested (e.g. Mokyr, 2002). How far, and for how long back into history, this divergence extended and how far there was technological isolation of China from the West was explored by Needham (e.g. 1985) and Temple (2007), who have documented the wide range of modern Western technologies of which the inventions, or their antecedents—which in many cases were superior to those later 'discovered' in the West—can be found at various periods in ancient and medieval Chinese history. However, during the Míng dynasty [明朝] (1368-1644) and the Qīng [清朝] (or Manchu) dynasty (1644-1911) the memory of many of these was lost, allegedly due to the increasingly isolationist and antiprogressive policies of the emperors and an administrative system buttressed by the traditional Confucian civil service examination system. This led to the historical irony that when the Jesuit missionaries began to bring examples of Western discoveries and inventions to China in the early 17th century they were sometimes bringing examples of things that both sides had forgotten were originally Chinese (e.g. Temple, 2007, p.11; cf. Elman, 2005; 2006).

While the degree of the isolation and relative economic development at different periods is increasingly contested, two puzzling questions have often been asked: Why did the early Chinese inventions not lead to a similar scientific, technical and economic development there to that experienced in the West, primarily from the Renaissance and then crowned by the various stages of the Industrial Revolution? And what were the mechanisms of diffusion from East to West and vice versa, by which (a) early Chinese inventions may have been transmitted to the West and enabled aspects of Western development (rather than independent parallel discoveries having taken place there) and (b) later Western inventions may have been translated into Chinese settings?

The first of these debates was the one that fascinated Needham to the end of his life, and he was convinced it was more in the differences in political, economic, social,

religious and educational organisation than in any differences in scientific and technical ability *per se* that the answer lay (e.g. Needham in Temple, 2007: 10-11). However, scholars have increasingly needed not just to ask why such development in China did *not* happen but to focus more on the factors, both structural and contingent, that produced the developments in the West that led to the Renaissance and to the Scientific Revolution there (e.g. Sivin, 2005). The second debate—as to the mechanisms, and direction, of diffusion between East and West—has also often proved to be dominated by speculation rather than by reliable historical evidence.[3]

In both cases it is only fairly recently that questions have been asked about the possible roles of the historical accounting developments that were taking place. Such questioning in relation to China forms a valuable complement to the re-awakening of a wider interest in the 'macro-questions' of the roles of bookkeeping and accounting in the shaping of Western organizations and institutions (e.g. Chapman *et. al*. 2009): but we shall argue here that those questions have generally been posed about China without an adequate theoretical framework from which to explore the potential significance and power of accounting.

In a separate paper (Anon*** 2012) we shall focus on the later history and the developments associated with industrialisation, first in the West and much later in China. Here we focus primarily on developments that had enabled the breakthroughs in the West associated with the Renaissance and succeeding centuries, focusing in particular on the 'conditions of possibility' for, and the specific emergence of, double-entry bookkeeping (DEB), as a technology which has often (particularly since Sombart) been associated with the subsequent spread of mercantile capitalism there. At both these key historical junctures we shall argue for the need to focus on the roles of particular textual and institutional forms of 'new' knowledge generation and transmission, on the consequent and historically specific 'new' practices of thinking and acting of those engaged in such generation and transmission, and on the distinctive new

[3] Tapping into the increasing fascination in the West with China as it emerges as an economic superpower, there have been recent intriguing and popular speculations by Menzies (2003; 2008) that Renaissance Italy derived its range of technical advances from supposed expeditions there by the famous Chinese admiral Zheng He. These were then supposedly 'lost' to China itself. Menzies's speculations have however been generally dismissed by mainstream academic historians (e.g. Thompson, 2008, consistent with Franke, 1967; http://www.1421exposed.com/ [*accessed 29.01.12*]).

knowledge forms and discourses that ensued. One such in the European world, we argue, was DEB.

With regard to China we shall correspondingly draw on our formulation of how the Western developments must be understood to approach the Chinese history in a way that problematizes the approaches of previous researchers (both Chinese and Western). We shall focus both on what we can know about the diffusion of accounting and managerial practices and discourses there from the limited evidence currently available and on where further key evidence is still needed from future research.

In the next section we first set out the key historico-theoretical issues, and how we have been able to utilise the evidence available to date, while recognising its essential limitations. Then in Section 3 we rehearse our own understanding of the textual, institutional and individual factors ('conditions of possibility') underlying the emergence of DEB in Italy in the Renaissance and its subsequent gradual take-over of Western accounting, to be able to have a basis for comparisons with the situation in China at various stages—dealing in Appendix II with related written monetary instruments. After that, in Section 4, we shall describe and evaluate the main interpretations given by previous authors of what is known about Chinese developments (with a particular focus on possible influences, in either direction, between the West and China)—with the details of the development of accounting practices being described in Appendix III. Finally in Section 5 we shall give our own evaluation, in the light of this comparative evidence, of how far we can know whether DEB did have an important role to play in the development of Western capitalism—although for the reasons first given by Yamey (see e.g. Macve, 1996) this role must surely have remained embryonic at best until the advent of 'managerial capitalism' in the US in the 19th century (Hoskin & Macve, 2000)—and correspondingly whether and how far what we (unlike much of the literature to date) see as the absence of a full DEB in China during the period up to 1840 may be considered to have conditioned the development of economic institutions and business organizations there. Given these respective problematizations of the effects in each geographical-economic-political arena and also of their possible historical interactions, Section 6 summarises our conclusions and indicates the future research potential of bringing study of China to illuminate the mainstream of accounting research.

2. Historico-theoretical debates: the significance of Western double-entry bookkeeping (DEB) and the evidence available for evaluating possible corresponding Chinese developments and its implications

Despite Yamey's continuing opposition (e.g. 2005),[4] Waymire and Basu (2007) have recently drawn on a number of authors' support in restating the 'Sombartian' and related arguments (such as Weber's) for the importance of accounting, and in particular of DEB, both for the economic development of Western capitalism and its business organizations, and for wider social and cultural influences in the West.[5] DEB has acquired a status that is now so surrounded by myth[6] that it is hard to disentangle the surviving evidence and gauge how far it has been either a sufficient or necessary response to meeting the information-processing demands for decision-making and control within a new economic and social order, or a sufficient or necessary instrument in creating that order—or indeed how far it exhibits both characteristics in a 'positive feedback system'. While Miller & Napier (1993) long ago deplored its excessive elevation to being the keystone of accounting, fascination with the phenomenon of DEB, and with Pacioli's first printed exposition of it in 1494, continually re-emerges (e.g. McCarthy *et al*., 2008; Sangster *et al*., 2008; Edwards *et al.*, 2009; cf. Yamey, 2010b).[7]

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[4] Confusingly, Auyeung *et al*. (2005) cite Yamey *in support* of Sombart's claim.

[5] Waymire and Basu do not include Bryer's (e.g. 2004) claimed Marxist restatement of DEB's Sombartian significance (cf. Macve, 1999); or the arguments subsequently advanced by Edwards *et al*. (2009) for DEB's significance based on the 'prospectuses' of authors of accounting treatises. See also Chapman *et al*., 2009.

[6] For example, many have cited Goethe as saying 'It is among the finest inventions of the human mind'. But Goethe puts these words into the mouth of Werner in *Wilhelm Meisters Lehrjahre* (I.10).Werner is an anti-hero so we need to respect the distinction between what a fictional character says and what an author believes (Macve, 1996).

[7] The major issues are reviewed in Macve (1985; 1996; 2002). As argued by Yamey (e.g. 1994) scepticism about how essential was DEB as a tool of capitalism's advance would suggest first the need to distinguish carefully between any reading of DEB as a cultural 'symbol' of capitalism's rationality and morality and an empirical, historical identification of the nature and extent of its use in practice by capitalists; and second a related need to distinguish claims made by those advocating its use (such as the writers of accounting treatises and teachers of DEB) and its actual advantages in practice, given how new 'information technologies' have been and are still rhetorically 'oversold' as essential to business success and/or organisational efficiency. Even if the authors of treatises were convinced themselves, they wanted to sell their books and/or attract pupils to their classes, so that, as with those who evangelise management techniques today, they had incentives and, under the traditional rhetorical commitment to presenting the good cause eloquently, justification for overselling the vaunted business efficacy of DEB. With the advent of the late 19th century professionalization of accounting, the need for a hallmark of their (contestable) distinctive professional knowledge (Abbott, 1988) would have given another boost to the propensity of auditors and other accountants to recommend adoption of DEB to replace traditional 'charge and discharge' accounting, whatever the disputed technical merits of the alternative systems (e.g. Baxter, 1980; Jones, 1992).

In exploring the development of Chinese bookkeeping and accounting over the corresponding centuries preceding the 1949 Communist transformation of economic and social forces and relations, it has been characteristic for researchers to take one of two approaches. The first is to take the Sombartian-style approach and see Chinese 'failure' to develop, or import, full Western DEB until relatively recently as at least a symptom, if not a cause, of its 'failure' to embrace modern industrialisation on any scale until the first half of the 20th century, some 150 years or more after the conventional dating of the start of the British Industrial Revolution (BIR) (e.g. Fleischman and Macve, 2011).

Alternatively, a more sceptical view of the significance of DEB in Western economic development has been taken (e.g. Gardella, 1992, following *inter alia* Yamey's work), which then challenges the perception that the Chinese were 'backward' in developing commerce and enterprise. That perception was largely inherited from the Western occupants of the Treaty Port Concessions (beginning in the 1840s following the Opium Wars) and was reinforced by Maoist propaganda that depicted the desperate state of most of the country's population for centuries preceding the 'necessary' Communist takeover (cf. Deng, 2000). Accounting researchers here have developed an argument that, while perhaps not achieving all the features of DEB, Chinese businesses and their bookkeepers/accountants over the centuries developed an indigenous form of 'Chinese double-entry bookkeeping' (which we here label 'CDEB') that was at least adequate for the development of the increasingly lively commercial sector in China, whereby the overwhelmingly agricultural economy brought a significant amount of its output (including home produced textiles) to market, and trade increasingly spread across regions as well as internationally (Richardson, 1999; cf. Xu and Wu, 2000). This kind of analysis has arguably been able to draw support from the growing range of work, associated with the 'California School', detailing the sophistication, extent and success of Chinese forms of agricultural, business and proto-industrial activity, and of the forms of banking and finance connected to them, across the centuries from the twelfth to the eighteenth / early nineteenth, and drawing positive comparisons with the analogous sets of activity as undertaken in Europe across the same eras before the BIR (e.g. Bin Wong, 1997; 2002; Goldstone, 2000; Pomeranz, 2000; 2002).[8] Recent comprehensive surveys

[8] At the same time, we stress the term 'arguably', since such work has focussed mainly, in the economic historiography tradition, on the similarities and differences between such constructs as levels of

of these historical developments, arguing for the importance of institutional features of the Chinese state and the structure of its political economy over the *longue durée* and how their legacies may be seen to have continued to shape the recent resurgence of the Chinese economy, are given by Deng (2011) and Brandt *et al*. (2011).

Evaluating the historical merit of these respective positions and their resulting understanding of Chinese development is complicated by three overarching difficulties. First is the continuing debate on both the origins of DEB and its significance in relation to Western post-medieval and modern economic development. Did it originate outside of or before late 13th century Italy? Was it integral (and if so how?) to Renaissance or Reformation capitalism and the subsequent centuries of development of commerce and trade? Was it subsequently integral to promoting the capital formation needed for the constitution of, and then measuring and managing the results of, firms of ever increasing scale, starting with the BIR in the 18th century? Or was it a technology of only limited and patchy adoption and import until it became an integral constitutive feature of the nineteenth-century US 'managerial revolution' when it discovered the power and significance it manifestly holds today (e.g. Hoskin & Macve, 1986; 2000)?

Second is the paucity of first hand evidence on developments in China, particularly at the levels of institutions' and organizations' accounting, financial and organizational practice, and the difficulty of generalising over such a long time scale about such a vast country, allowing for the many regional differences, at different times (e.g. Richardson, 1999; Ma, 2004). Compared to a British colony of comparable size, such as India, there are very few reliable statistics even about 19th century China, compounded by the hiatus in the Maoist period from 1949 until the 'reforms and open policy'—begun under Deng Xiao Ping in 1978—that has led to China's amazingly rapid economic growth in the last three decades. Moreover, there are, in particular, few surviving original business and accounting records from before 1949 that have been reported on, and access to those has mainly been by researchers writing in Chinese; while researchers who have written in English have sometimes, as we shall see, exhibited a less than complete grasp of the technicalities of DEB and the historical arguments surrounding it, which undermines

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production and productivity, rather than the micro-level of the technologies of financial record-keeping, performance tracking and stewardship evaluation or audit put to use (or not) in these respective cultural contexts.

confidence in some of their comparisons between DEB and their claimed indigenous equivalent in CDEB.

Thirdly, the issues of the extent to which the Chinese developments were indigenous and isolated from Western influences, and *vice versa* how far Western developments may be traced back to China, are also highly contested, often well into the 20th century.

The last question is the one we are primarily interested in exploring here, motivated by the questions raised by Needham's discoveries about early Chinese scientific and technical knowledge. But as all three questions are interrelated we propose to approach it first, by making clear our own interpretation of the role of DEB and accounting more generally in Western business and management history, based on previous literature; second, by setting out our own critical interpretation of previous literature on Chinese accounting and management history;[9] and finally, by considering how far influences in either direction between China and the West can be identified in the light of our reappraisals of both the Western and the Chinese developments.

While the limited first-hand evidence available still forces us to conclude that at this stage there remain far more questions than answers, our aim here is to clear away misconceptions that have accumulated in the existing literature and to indicate what we believe are the important questions that should in future guide Western and Chinese researchers, preferably working collaboratively, in approaching the original Chinese archive material that now appears to be opening up. We believe this archival research is now crucial for further understanding and has the potential to shed light not only on the nature of Chinese developments and their possible interaction with those in the West, but thereby also to reformulate how Western developments themselves should be understood through a comparative international, historical lens. In turn, this reformulation may have potential interesting implications for the future path of globalisation (Chiapello and Ding, 2005) and in particular, now that China has joined the global standard setters,[10] for the project for internationalisation of accounting and

[9] In a separate paper (Anon***, 2012) we shall report our own investigations into what is known about the development of the Chinese railways from around the end of the 19th century and the possible interrelationships between the Western and Chinese histories of the emergence of industrialized 'big business' (and the role of Japan—Kudo & Okano, 2011).

[10] The IASB's first Chinese Board Member, Dr. Zhang Wei-Guo, joined in July 2007: http://www.ifrs.org/The+organisation/Members+of+the+IASB/Zhang+Wei-Guo.htm and was reappointed

auditing standards and the 'translation' of the models of these that have developed in the West into the very different linguistic and literate traditions of Chinese culture (cf. Mennicken 2008 with respect to Russia).

In order to manage this wide range of historical material, we limit our explorations in this paper by selecting our historical dividing line around the middle of the 19th century. In China the Treaty of Nanking in 1842, following the first Opium War, was the first of the 'Unequal Treaties' that created the Treaty Port system that gave trading and other privileges to the Western powers and has generally been seen (especially in conventional Chinese presentations of history—Richardson, 1999: 40-41) as the watershed that 'opened up' China to Western influences (cf. Deng, 2011).[11] Elsewhere by international comparison, this period saw Britain's industrial and imperial might celebrated in the Great Exhibition of 1850, at which were also exhibited examples of the 'American System of Manufactures' that symbolised the emergence of the US, which was destined to become the next major world economic, and then military, power (e.g. Hoskin & Macve, 1994a).

In exploring our three questions we focus here on comparisons with the knowledge developments in medieval and Renaissance Europe and how these were exemplified in the invention of DEB. We seek to ask whether—and if so when—we can see knowledge developments in China that match those that have been argued (e.g. Hoskin & Macve, 1986; 2000) to have formed the constellation of 'conditions of possibility' in which first DEB and then, much later, the managerial capitalist revolution engendered major historical discontinuities in the West. Building on that foundation, we also wish to ask: what do we know, or alternatively can we now begin to know, of the history of mechanisms of transmission and translation in either direction between China and the West of knowledge developments—such as accounting practices, or circulation of money, or management and accounting activity—through undertaking a 'genealogy'

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for a second term in January 2012. A Chinese practitioner member, Chen Jianshen, was appointed to IAASB in January 2011: http://www.ifac.org/IAASB/bios/bio.php?bio=jianshen-chen ; Yong Li, President of the Chinese Institute of Certified Public Accountants (CICPA) and Vice Minister to the Ministry of Finance (MoF), PRC, was appointed a Trustee of the IFRS Foundation in January 2012: http://www.ifrs.org/Alerts/PressRelease/new+trustees+jan+2012.htm; and Yang Min (Director General of the Accounting Regulatory Dept, MoF, PRC) and Prof. Huang Shizhong (Vice President and Professor, Xiamen National Accounting Institute) as members of the IFRS Advisory Council in January 2012: http://www.ifrs.org/The+organisation/Advisory+bodies/The+SAC/Members.htm [all sites accessed 3.Feb.2012].

(e.g. Foucault, 1977, 2009; Gutting, 2005; cf. Power, 2011) of the respective practices through which *writing-based* instruments such as forms of accounting, paper money and management texts were articulated and implemented in the respective literate cultures?

Such a form of analysis needs to respect differences in such necessary vehicles of knowledge as sign systems, textual layouts, and forms of teaching and learning. While both the West and China had paper and printing by the time of Pacioli (the Chinese inventions having been several centuries earlier) Chinese modes of writing—characters and layout—are strikingly different from those of Western alphanumeric systems (Robinson, 2009—see Appendix I). An analytics of accounting needs to consider how and how far this may have affected the conditions of possibility for the emergence in China, first of Western-style DEB and, much later, of 'grammatocentric' modes of exercising knowledge-based power of the calculation-centred kind that developed in Europe and the US by the mid 19th century (e.g. Hoskin & Macve, 2000). At the same time analysis needs to acknowledge that, across all such differences, a principle of interlinguality or translatability apparently obtains universally, whereby humans succeed in communicating, orally and in writing, across languages and sign systems, and thereby in supplementing what was previously known within and by a given culture. More specifically, when such interlinguality and translatability take place between literate cultures (e.g. Ong, 1982; Harris, 2000)—proceeding through the given sign systems, textual layouts and modes of teaching and learning of each—then the interplays that take place, while never precisely specifiable, are bound to contribute to supplementing, within each culture and across them, not only what was previously known but what becomes knowable and even how it becomes known.

Previous researchers in accounting history (see e.g. Lu and Aiken, 2003) have addressed possible religious and philosophical cultural influences on the development of Chinese accounting such as Confucianism (Bloom & Solotko, 2003), alongside Feng Shui and Buddhism (Gao and Hendley-Schlacher, 2003) but have failed convincingly to delineate how these influences actually distinguish Chinese from Western *accounting practices*. Such influences would in our view—as in all societies—seem more likely to operate at the level of the social and cultural frameworks underlying work organisation,

[11] The Emperors had closed all ports except Canton (modern Guangzhou) to all foreign trade, except that

employment practices, and business and financial relationships (e.g. Child, 1994), and also often be characterised by a kind of necessary collective 'hypocrisy' (e.g. Brunsson, 2002), where at one level respect is always ritually paid to these higher ideals to cement social and organisational cohesion, while at another there is development of institutions, practices and attitudes which encourage apparently incompatible activities.[12]

Our own historical explorations here have faced the severe historiographical constraint that we have had to rely on secondary sources for all the historical material relating to China itself.[13] Moreover the similarities found in extant histories of early Chinese accounting developments may suggest that there has been little available first hand evidence to date with which to challenge possible interpretations, so we are at present still left with 'more questions than answers'.

We shall concentrate on the development of commercial bookkeeping and accounting practices in China, to complement the well-established history of developments in Governmental accounting, audit, finance and money-supply management (e.g. Li, 2007; Davies, 1994; Guo *et al*., 2011). Generally previous writers have focussed on indigenous factors that may have influenced or been influenced by developments in commerce, industry and in accounting. Our primary focus however remains the possibility of Western-Chinese exchanges of influence at key junctures before the clearly identifiable later 19th century introduction of Western DEB and management practices and, in addition to setting out our distinctive view of the genealogy of the significant Western accounting and management developments, this is the major new aspect of our approach.

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with Asian partners, since 1757 (Brandt *et al*., 2011, fn 54; 57).

[12] An example where such ideals clearly influenced the need to develop alternative accounting and business practices in Europe was the medieval ban on usury, requiring the development of alternative legal forms to achieve the effective payment of interest; which has parallels in the some of the techniques of 'Islamic finance' today (e.g. Napier, 2009).

[13] We generally use the modern pīnyīn system for Romanisation of Chinese characters, but where our sources use Wade-Giles we sometimes follow them. An equivalence table can be found e.g. in Appendix II to Hsü (2000). We also selectively give the corresponding Chinese characters.

3. Double-entry bookkeeping (DEB)

Like some previous authors on accounting history in China and other related Asian countries who have questioned the significance of DEB's role in the West,[14] we regard it as essential in interpreting the possible significance of developments (or lack of developments) in the Chinese context, to first set out our understanding of the significance of Western developments in the Western context.

By the 'full' DEB against which we will compare CDEB we mean the system whereby fully monetised changes in assets-liabilities are processed through an integrated, fully indexed and cross-referenced system of account 'books' (whether kept manually or nowadays electronically), and thereby equal the change in equity for the accounting period. If there are no transactions between the owner and the business entity this change will equal the profit (or loss) for the period as revealed by the balance of the 'revenue' and 'expense' accounts[15] (what is nowadays labelled the 'clean-surplus equation'). A 'balance sheet' and a 'profit and loss account' are thereby quasi-automatic outputs of the system which are nowadays presented as 'financial statements' (e.g. Macve, 1985).

'Double-entry' is sometimes used in the literature more loosely to refer to systems which only record the 'natural' functional duality of asset (inventory) movement accounting, reciprocal debtor/creditor accounting (particularly in ancient banking-type institutions—Davies, 1994: 53) and summarisation of detail, which are found (both with and without monetary amounts) in many cultures. In more modern Western records, historians have, in similar manner, sometimes also seen DEB where there is really only 'charge and discharge' accounting, which may also employ the labels 'Dr' and 'Cr' (cf. Lee, 1994; Hoskin and Macve, 1994a: 6). But here we use DEB to refer to the 'full' system[16]—as described in Pacioli's first printed exposition of it in 1494—which forms the basis for the arguments by Sombart and Weber, and in a later context by Bryer (claiming the support of Marx), that capitalists could, thanks to the new technology, generate a new kind of measure of the rate of their accumulation of capital (c.f. Macve, 1999; Chiapello & Ding, 2005; Chapman *et al.* 2009).

[14] e.g. Gardella (1992) on China; Jun and Lewis (2006) on Korea.
[15] perhaps supplemented by 'other comprehensive income' accounts for revaluations etc.
[16] What King (2010), who describes the variety of bookkeeping systems employed in the Foley family's charcoal ironworks in the late 17th century, calls 'the classic Italian method'.

Attempts to find the origins of, or forms of, DEB as understood here in a variety of other ancient civilisations have so far failed (e.g. Macve, 2002), but here we will attempt to explore the possibilities for any links to China. First we need to restate the thesis for its emergence complementing the unique 'conditions of possibility' in late 13th century Italy (i.e. approximately 200 years before Pacioli's exposition), when the first examples of DEB as a practice can be found (e.g. Macve, 1996).

3.1 The genealogy of DEB: text layouts, sign systems, pedagogy and examination: on the conditions of possibility for forms of bookkeeping (and paper money)

Our first issue of concern confronts what may be treated, at least initially, as a textual and sign system problem: the conditions of possibility for particular forms of paper monetary instrument and accounting. Here we wish to extrapolate a possible way of approaching the possible differences and overlaps between European and Chinese experiences by drawing on ideas first developed in Hoskin & Macve (1986). That paper sought to explain how DEB was first developed when and where it was in medieval Europe as one precipitate of a set of textual and sign system breakthroughs taking place in the elite educational institutions of twelfth-century Europe which then transformed the existing alphabetically grounded ways of writing and thinking and the institutional places where they were undertaken.

The central *theoretical* argument of that work was derived from a reading of Foucault's analyses of how historically particular *forms* of power-knowledge relations take shape only as humans come to think and act under historically specific types of pedagogic practice, which then shape in new ways both how and what they learn. In a central section of *Discipline and Punish*, 'The Means of Correct Training' (Foucault, 1977: 170-195), he observed how the modern pedagogic practice of 'examination' as developed in the later eighteenth century was the technology through which modern disciplinary ways of acting and of knowing began to become integral to us as human subjects and to the construction of the social and institutional worlds we inhabit. As he put it in reflecting on the examination's central role in the constituting of disciplinary power: it 'combines the deployment of force and the establishment of truth…. The

superimposition of the power relations and the knowledge relations assumes in the examination all its visible brilliance.'

The theoretical extension involved analysing how an earlier but structurally similar set of power-knowledge relations was articulated in medieval Latin Europe, particularly from the twelfth century on. This analysis focused on how members of a literate elite, educated within Cathedral schools and the nascent universities, came systematically to engage with learning through new modes of writing and reading texts, crystallised in a new pedagogic practice of critical reading named by Abelard in the 1130s in his *Sic et Non* as '*inquisitio*'. Members of this new literate elite generated forms of re-writing—not only intellectual texts but forms of juridical truth-telling or 'veridiction', as in the legal form of inquisition first established in the 1200s by the Catholic Church—and also of administrative coordination, through such textual forms as the *contrarotulus* / *contre-rolle* or counter-roll, the first-named vehicle of 'control', developed as a written digest of key decisions in the Norman court in England around 1200.[17] The inquisitorial 'hearing' of the periodic state of accounts (an oral/aural examining practice hence known as 'audit') was another development of this pedagogic world that mixed new modes of reading and writing with a new inquisitorial and examinatorial practices of truth-telling.

What we need to recognise here is that parallel to this earlier Western pedagogy, enabling the development of the first universities, which was a mainly *oral* form of examination combined always with *qualitative* evaluation, there was also a Chinese pedagogy of much longer pedigree, of centralised, uniform written examinations developed in elite educational settings and to select potential scholar-administrators; but again these also had, so far as the historical record indicates, only *qualitative* forms of evaluation (e.g. Elman, 2000; Brandt *et al*. 2011).[18]

[17] This was not, as its name might suggest, a duplicate copy of an original but a digest made of key issues from already duplicated books of initial entry, and the etymological source of today's 'control'.

[18] When we consider the later 19th century developments in China and their interrelationships with the influences of the newly arrived Western powers (Anon***, 2012), we shall draw further on Foucault's work on the *particular form* of examining, developed for the first time, it appears, in the late eighteenth century in elite Western institutions of higher education: namely an examining that was both written *and* numerically graded (cf. Hoskin, 1993) and which was introduced to the US at the military academy at West Point (Hoskin & Macve, 1988). We shall also explore the significance for the development of the 'governmentality' framework in understanding accounting's power on recent exegesis of how Foucault's more recently published works reveal *his own* endeavour to analyse the importance of *gestion* ('management') as a new form of power, originating 'from the bottom up' in new practices of action and thinking (e.g. Hoskin 2012). This leads us here to think in terms of considering how new pedagogic and textual practices at *other* historical moments than the late eighteenth century may have constituted new

At the same time, we are in no way *then* committed to having to see DEB as having had to play, in the ensuing European centuries before the nineteenth, any significant transformative economic or governmental effects at the level either of business organizations themselves or of those large European entities of 'the state' or 'the economy'. The fact that DEB became thinkable, and then thought and written by a range of literate human subjects within Europe, carries no implication that it must *ipso facto* have become some major transformative economic or governmental technology. That is an issue for empirical investigation.

If that is the theoretical argument we wish to build on here, its central *empirical* ground is that, particularly—although not only—in France, three types of new textual and pedagogic developments came together from the twelfth century: these comprised (A) changes in reading and writing, including the adoption of word division within a silent *critical* reading of alphabetic texts (Abelard's *inquisitio*); (B) the development of arabic numeral notation including the '0' signifier (thus enabling the writing of numbers with 'place value' and the development of columnar forms of addition and subtraction of specific numbers—gradually (cf. Macve, 1996; 2002) displacing the previous default technology of the West as much as of China, the abacus); and (C) the development of the first pedagogic institutions whose teachers undertook formal examination (via the new *inquisitio*) of student performance and were empowered to award qualifications based on their evaluation of that performance. Thus a new textual formatting and way of reading of accounts became possible, for those who became proficient in the new 'alphanumeric' sign system, particularly where they had studied and acquired qualifications from the new 'universities'.

This set of textual, pedagogic and institutional transformations and the correlative constitution of the new kind of literate knowledge expert, the 'graduate', constituted the conditions of possibility, both for the specific and Western textual breakthrough known as DEB; and also for such supplementary accounting-grounded developments as

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sufficient 'conditions of possibility' for thinking and acting, which consequently made for new things thought, said, written and done. In particular, following up on the analysis given in Hoskin and Macve (1986), we would argue here that, once one views DEB as one of the things rendered thinkable for the first time by the new twelfth-century western European pedagogic and textual conditions of possibility that we shall trace below, we have the *analytical* basis (in Foucault's use of the term) for seeing it as something that would not be replicable in any easy way in a cultural world that did not have all those conditions of possibility—unless it is possible to conceive of *alternative* sufficient sets of conditions arising there (Hoskin & Macve, 2000; Morley, 2011).

the first European form of paper monetary instrument, the bill of exchange. Soon there were endorsed and discounted bills which circulated in the world of DEB and constituted—even before the establishment of the first central banks—a form of paper money whose value was guaranteed not only through the writing on the bills but also through their connection to the accounts, ultimately held in banks, upon which they were 'drawn' (for Chinese developments, see Appendix II).

These new conditions of possibility did not, of course, only enable the constitution of DEB. But DEB's appearance by the early 1300's in this elite literate European context makes sense as one feature of a general shift in how elite literate human subjects thought and acted, through a new engagement in writing and examining which led more generally to texts developing a new visually informative clarity, allied to the development of techniques for the swift and accurate location of passages for scholarly re-writing, e.g. the use of numbers for text divisions (as in the chapter and verse format in the Bible, or forms of page numbering), leading to the development of information location and retrieval systems, such as the alphabetised index, the word list or lexicon, and such supplementary forms of textual writing as marginal notes and footnotes. New kinds of organized compilation texts were then developed: not only the *Summae* of theologians and the 'Mirror books' of philosophers, but such texts as the (English) Norman court's 'counter-roll'.

DEB, as later expounded in the 1494 printed work of Pacioli, therefore initially emerged as a textual breakthrough, through the combination of the new kind of textual layout with the use of the new 'alphanumeric' signs. Such signs, laid out in columnar form, and kept in sets of accounting entry, could then be made up into 'mirror texts' where debits reflected credits, for example through being laid out side by side in the columnar entries of the 'Venetian method', and these mirror texts could then be formed into counter-roll series enabling 'control', as in the waste-book (or 'memorandum'), journal and ledger structure.

Once these textual and scriptural techniques were brought together DEB was 'invented', in the sense of being a knowledge breakthrough which had simply been absent before; and behind its invention were those who had become literate in the new ways first taught and internalised in the first universities, many of them taking the step (or in Latin *gradus*) up to becoming 'graduates'.

These ‘graduates’ were the majority of the men who had begun to occupy positions of state and religious power—in a new world where the spheres of power, money, art and culture were intertwined (Jardine, 1998)—and to circulate the new kinds of text, which increasingly (although not all at once) began to be written in alphanumeric script. As they did so they also carried the practice of examination into new arenas of formal activity, including the development of the ‘audit’ (i.e. aural ‘examination’) of financial stewardship. Pacioli was a product of this system (Macve, 1996).

Therefore in arguing that the system of DEB did not emerge simply in response to commercial needs, what Hoskin & Macve (1986) argued was that it was developed when and where it was because of the circulation by the newly powerful graduates both of the appropriate form of textual layout and sign system and equally because of their commitment to a constant critical reading and examination of what was written in the alphanumeric signs in the new forms of text. Auditing, bookkeeping and a commitment to (textual) forms of control were one set of outcomes which we can now see as interrelated, as a series of precipitates of these three new ‘conditions of possibility’. From these beginnings DEB emerged to become what we recognise today as a fully integrated system whereby the duality of all transactions is reflected in appropriate real, personal and nominal accounts, allowing tracking of all changes in owners’ equity, in particular by periodic transfers from ‘profit and loss’. Historically in handwritten accounts transactions were marshalled through three stages: an initial chronological memorandum/waste book, followed by a journal which identified the two accounts to be affected, and then by posting to the respective accounts in the ‘ledger’. From the ledger accounts a ‘trial balance’ could be extracted (in principle at any time) preparatory to preparing closing entries and financial statements, in particular the ‘balance sheet’ and ‘profit and loss account’ (see e.g. Yamey, 2010a).[19]

[19] There are of course essential ‘functional’ elements of duality in other systems that are not full DEB. Where businesses trade with other businesses on credit their suppliers’ and customers’ ‘personal’ accounts will need to be ‘debited and credited’ as appropriate with respect to transactions for goods and cash settlements. And where there are loans or borrowings, as were made by banks and also by many ‘merchant bankers’, the respective counterparties’ personal accounts will need to be ‘debited and credited’ with advances and repayments. Keeping track of movements in stocks of inventory likewise requires the relevant ‘real’ accounts to be ‘debited and credited’ Again, in ‘charge and discharge accounting’ a ‘steward’ or ‘accounting officer’ is held accountable by being ‘debited’ for all cash and property with which he is entrusted and ‘credited’ when these are rendered back or disbursed on legitimate expenses (e.g. Baxter, 1980; Hoskin & Macve, 1994a). But these systems lack the final

What we would therefore wish to pursue in relation to China is the possible set of interplays between that culture's non-alphabetic sign system—with its own distinctive systems for numbering or counting, and its distinctive forms of textual layout[20]—and its independently developed and earlier form of examination in the constitution of its own literate and educated elite,[21] together with its own forms of paper money and accounting. We do so, not assuming that the conditions of possibility would need to be the same, but simply raising the idea that conditions of possibility should be sought and compared.

One possibility of course is that there is some direct translation from China to the West of such forms. However although, as we have noted, there are recent speculative claims by Menzies (e.g. 2008) of circumstantial evidence that the Chinese 'kick-started' the European Renaissance in a range of ways in 1434, in fact Menzies himself is well aware that DEB had already been a Venetian practice for a long time.[22] So we need to go back further: and of course the late 13th century coincides with the travels of Marco Polo to China.

Arguably the evidence for a translation of Chinese accounting to the West looks tentative at best: and we might add that, if the three conditions of possibility for DEB set out above are accepted as reasonable, then any such a translation would need to allow for the differences in forms of: (A) textual layout, (B) sign system and (C) specific modes of examination (not least the connection of examination to formal qualification granted by the examiners themselves but also exportable into other 'power-knowledge' arenas). With respect to (A) and (B), Appendix I illustrates how different are the ways of reading Western and Chinese textual (including numeric) presentation which, as we shall argue,

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interlocking achieved by DEB through the use of nominal accounts that record the causes of the increases and decreases in the equity owner(s)' own interest in the entity being accounted for (which may or may not include the owner's personal property). We shall argue below that the secondary evidence presented in the existing English-language literature has so far failed to establish that CDEB went beyond the functional level of duality that is needed in maintaing 'real' and 'personal' accounts.

[20] For illustration see Appendix I. Cf. Derrida (1978)—although the significant new change in the West is actually the grammatocentric move *within* the logocentric/grammatological truthworld that had been analysed by Plato long ago.

[21] Elman (2000) suggests that the ideas of evidence-based scientific enquiry may first be seen emerging in China in the practice of critical commentaries by examiners on the candidates' scripts of their 'eight-legged' essays for the Imperial Examination.

[22] Menzies (2008: 74), describing Venice and its prosperity at the time he claims that Admiral Zheng He arrived in Italy, observes that: 'For more than 150 years before Zheng He appeared, Venetian bankers had been using a cashless giro system, crediting one merchant and debiting another'. That is a very strange description of the banking examples in Pacioli's *de Scripturis* (e.g. Macve, 1996).

is evidenced by the layout of Chinese accounting books throughout the Imperial period and beyond.[23] Moreover, while a standard currency unit and coins were introduced under the first Qín emperor (who ruled 221-210BC), the extent of monetization in the economy at different times is unclear.[24] With respect to (C), while the practice of examination in determining qualification for the Imperial Civil Service lasted for hundreds of years, and cast its shadow over the whole of Chinese education, it offered only qualification into that one elite cadre and did not have the wider powerful influence of Western 'graduation' from the new 'universities' that provided the intellectual underpinning for the advances that would gradually be made in all spheres of learning and ultimately in modes of scientific enquiry and philosophical scepticism that were opposed to the religious legacy of their institutional foundation.[25] Ultimately, in the 'new West' of the 19th century USA the universities would embrace the disciplines that extended into the new areas of professionalisation, including management and accounting (Hoskin & Macve, 1994b).

However, while the conditions for transmission of DEB seem absent, the possibility of transmission from China of ideas about, or forms of, paper money or bills of exchange / drafts may be more plausible. We address this possibility in Appendix II in order to keep the main focus of the paper on the development of and possible Western influences on Chinese bookkeeping and accounting systems.

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[23] For an example of complaint by a modern Western-educated Chinese about the difficulties of the Chinese character system see: http://www.learnchinese-all.com/chinese%20writing.html (*accessed 31.08.2011*).

[24] Yuan & Ma (2010) discuss the problems caused by bimetallism in the 18th-19th centuries.

[25] Brandt *et al.* (2011) situate the persistent role of this elite institution, and of the universal, if near impossible, aspiration to qualify to join it, in shaping China's political economy over the *longue durée*, seeing residues in the re-emerged thirst for educational qualification in China today, overcoming the intellectual deprivation of Mao's 1966-76 Cultural Revolution.

4. Chinese bookkeeping and accounting history.

Previous English-language literature has identified several stages in the development of Chinese bookkeeping practice, beginning with the first evidence of writing.

Lu and Aiken (2004) argue for a broadly similar but independent[26] line of Chinese development to the Mesopotamian findings by Schmandt-Besserat, from about 3,200 BC, of impressions made on clay *bullae* containing tokens. They focus on the interrelated evolution of writing, abstract counting and accounting systems and the development of Chinese characters, of which the most famous early examples are the ox-bone and turtle-shell oracular inscriptions from the late Shāng dynasty (1766-1122 BC). Called *jiǎgǔwén* [甲骨文] and discovered in 1899, they record divinations and include countings of various animals. They have linkages to slightly later bronze-vessel inscriptions, reaching their acme in the Western Zhōu dynasty (1100-771BC). There are possible, albeit still controversial, linkages to earlier pottery inscriptions dating back to at least 4000 BC and possibly even earlier (e.g. Basu, 2009).[27] This Chinese evidence is consistent with that from Sumeria (e.g. Macve, 1993—although its stages also remain contested)[28] that people invented writing for purposes of counting and accounting, and

[26] Robinson (2009: 20-23) notes that some scholars argue that 'China could surely have borrowed the idea of writing from Mesopotamia during the 3rd/2nd millennium BC or after via the Central Asian cultures of the Silk Route, and gone on to develop the unique set of Chinese characters' but points out 'that there is no evidence for any such borrowings from Mesopotamia by writers in China, the Indus Valley, Crete, or Meso-America. Moreover the signs of the scripts from these regions are extraordinarily unlike each other'. So independent development 'in response to local needs' is supported by many scholars.

[27] Unfortunately Lu and Aiken's conclusion (p.48) states that 'Chinese characters…remain pictographic in nature' whereas their discussion (p.38) has shown that the signs include both pictographs (of objects) and ideographs (including numbers; prepositions) which later Chinese characters have supplemented with 'phonetic derivatives' (where words borrow the sounds of other words, such as in the word for the 'sampan' kind of river-boat, 舢舨 [pīnyīn: *shānbǎn*] which makes use of the symbol for 'mountain' 山 [pīnyīn: *shān*] just to indicate the pronunciation). Robinson (2009: 111-113) notes that 'today the vast majority of characters, over 90 percent, are of [this last] "semantic-phonetic" variety.'

[28] E.g. Robinson (2009: 7) summarises the case against Schmandt-Besserat's argument that the external marks on the clay *bullae* that contained tokens counting sheep, bushels of grain etc. 'were a step towards the marking of clay tablets with more complex signs, and the consequent emergence of writing'. Nevertheless he accepts (p.8) the general view that the first writing was for counting and accounting 'as a result of commercial requirements', while noting that 'it is puzzling that in China, India and Meso-America accountancy is little in evidence in the earliest writing' that has survived. A crucial stage in conceptual development was the separation of 'naming' and 'counting' (which constitute the double role of accounting—Ezzamel and Hoskin, 2002) from the original language systems that identified 'numbered collective objects', of which a few relics (such as a 'brace' meaning 'two game birds', or a 'yoke' meaning two oxen) still survive in English today (Macve, 1993). Mattessich (1994) is cited by Lu and Aiken (2004) in support of the view 'that the ancient Sumerians practiced a kind of double-entry record keeping some 5000 years ago'. Mattessich's argument here is unconvincing. Arguments like this for 'ancient' examples of DEB unjustifiably extrapolate from the basic functional duality of asset (inventory) movement accounting, reciprocal debtor/creditor accounting and summarisation of detail, which are found (both

from Egypt that accounting relationships pre-date writing (Ezzamel and Hoskin, 2002). 'Money-of account' often predates physical monetary forms (Davies, 1994: 47-57).

Several authors[29] have traced the history of Chinese bookkeeping from the earliest forms of government accounting and related government 'auditing' known in the Western Zhōu dynasty, through what is claimed to be the emergence of an indigenous Chinese form of commercial double-entry bookkeeping (which hereafter we call 'CDEB') during the Míng and Qīng dynasties (mid-14th to early 20th centuries AD), prior to the known introduction into China of Western DEB during the late Qīng period after 1840, and continuing into the 1920s-30s. While this time-scale potentially suggests some possible knowledge-transfers between China and the West, or between the West and China, these claims for CDEB first need to be examined carefully for sufficient 'conditions of possibility', with particular reference to the textual, script and institutional power-knowledge conditions we have identified in the case of Western DEB (as (A), (B) and (C) above).

The various authors who have published in English present the historical developments in China, on the whole, as generally received knowledge, and without critical debate.[30] In the absence of much identification of surviving original records, distinguishing the precise 'stages' and extent of these claimed historical developments is not straightforward.[31] The detailed stages that these authors set out are given in

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with and without monetary amounts) in many cultures and also form basic elements of—but do not in themselves constitute—the full DEB system. Ancient systems of this kind could reach a high degree of complexity in interlocking accounting systems, e.g. for the multiple sub-entities of a large estate in 3rd century AD Roman Egypt (Rathbone, 1994; Macve, 2002).

[29] e.g. Zhao, 1987; Guo,1988b; Gardella, 1992; Lin, 1992; Aiken and Lu, 1993, 1998; Huang and Ma, 2001; Lin, 2003; Li, 2007; Solas and Ayhan, 2007; Song, 2011; Guo *et al.* 2011. Further authors have focussed more on the period after 1850 (Anon***, 2012).

[30] We mainly follow Aiken and Lu (1998) as these various authors all generally appear to base their evidence primarily on the prior secondary literature in Chinese, in particular Guo Daoyang's two-volume *History of Chinese Accounting* published in 1982 and 1988 in Beijing by Chinese Finance and Economics Publishing House; as well as Wei Zhenxiong (1984), *Chinese Bookkeeping Methods*, Beijing: Chinese Financial and Economic Press; and Zhao Youliang (1992), *Accounting and Auditing History in Ancient China*, Lixin Publishing Company. They generally do not differ significantly in their interpretations of these Chinese writers, whose only papers to date in English appear to be Zhao, 1987 (who makes reference to some archival records but without identifying how they can be accessed), Guo, 1988a, 1998b, and Guo *et al*. 2011. However, Lin (1992; 2003) differs from Aiken and Lu (1998) over some of the nomenclature and dating of developments (but neither specifically comments on the other) and Ji (2000: 50) notes, in relation to the similarities between CDEB and DEB, that 'Lin [1992] believes that the principles between the two methods are basically the same. Aiken and Lu [1998] contest that the underpinning of Western bookkeeping method is the property right and the fundamental basis of the Chinese bookkeeping method is the cash movement.' But he does not elaborate further.

[31] Extensive accounting records of the Tǒng Tài Shēng enterprise, from Daliu Town, Ninjing County of Shandong Province, have recently been found covering 1798-1850 and are being analysed for the data

Appendix III. Here we summarise the story that is told, incorporating our own more critical commentary.

The main developments in antiquity occurred in government accounting, beginning in the Western Zhōu dynasty (late 12th to early 8th century BC), which was 'still in the era of the slave system' (Zhao, 1987: 166), where the authors identify early record keeping by the 'Three-Column' method for tracking receipts and disbursements and their balances, in accounting for inventories of grain and precious goods— such as gold, silver, silk and jade—collected through different kinds of taxation; together with the related emergence of various early forms of audit.[32]

Commercial activity suffered from the stated distaste for 'profit' in the Confucian doctrine that permeated society and the imperial civil service. Merchants did flourish for over 500 years in the Spring and Autumn period (early 8th-early 5th centuries BC—when the economy was transformed from slavery to feudalism (Zhao, 1987: 167)) and in the Warring States (early 5th-late 3rd centuries BC) period. However thereafter, from the ascent of the first Qín emperor in 221 BC, they were more often despised and even branded as criminals for more than 800 years, until the Táng and Sòng dynasties (early

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they reveal about the economic history of the time (Yuan and Ma, 2010) but exposition of the accounting system (Yuan, 2010) has not yet been published in English, although we have had the benefit of discussions with Dr. Yuan Weipeng during his visit to the UK in 2010-11 and we aim now to collaborate with him on producing an English-language analysis of the accounting structure and practices that they reveal. Prof. Cao Shuji of Shanghai Jiaotong University has shown us account books from a Qīng dynasty iron mill in Shichang village (so far only published in Chinese) which mainly comprise daily financial records with periodic aggregations of only physical output quantities. Some photographs of a bank draft, and of transfer and deposit records from the famous *Rìshēngchāng* bank in Shanxi province in the 19th century are given by Morck and Yang (2010); and Gardella (1992: 325) gives a photograph of a sample page from the general account book of a Shanxi bank in Beijing dated 1842-44. Gardella (1982) describes and gives some photographs of simple business records—the earliest from 1842—held in Columbia University's library. Guo *et al.* (2011) give photographs of a 'silver receipts and payments' annual report from a pawnshop in the Wànlì period of the Míng dynasty (1563-1620) and a 'Red Account' from a Shanghai private bank from the Guāngxù period of the Qīng dynasty (1875-1908) but they are too small to read and no translation is provided. Surviving Korean records of the Mun Clan Association from 1741-1883 are discussed and illustrated by Jun and Lewis (2006). (Some records of Chinese and Japanese accounting in the late-19th century will be discussed in Anon***, 2012.)

[32] Of Guo's (1988b) eight pages almost all are devoted to the developments in governmental accounting, internal control and audit from the end of the 2nd millennium BC, with only about one page focussing on the developments in commercial accounting and CDEB (a comparable relative emphasis is presented in relation to the relevant historical periods in Guo *et al*. 2011). In the case of the former, it is not clear what the relationship would have been at different times between oral accountability and written records, although the scale of Chinese geography and the long-standing stability of the system (despite frequent changes in the ruling dynasties) perhaps makes it more likely that written accounts and reports had greater importance for the Emperors much earlier, and with much greater continuity back to antiquity, than in say England in the Middle Ages (e.g. Jack, 1966). Against this it can be argued that the retention of the format of writing out numbers in full in Chinese characters (See Appendix I) may suggest a tradition

7th to late 13th centuries AD) adopted a more encouraging approach.[33] As, noted above, circulation of paper money by the state, and also among merchants, appeared as early as the 9th century AD (Davies, 1994: 180-83), but writings about commerce, banking and accounting remained rare.

During the era of the Míng and Qīng emperors (mid-14th to early 20th centuries AD), commercial and credit activities gradually increased further, albeit still circumscribed within the 'bureaucratic feudalism' that characterised most of the mainly agricultural and domestic economy. There were now three successive stages of records in the bookkeeping system, argued to be comparable to the 'Memorandum' (or 'Waste Book'), the Journal and the Ledger used in DEB. What the authors generally claim to be the indigenous development of CDEB (the *Lóngmén* system) originated from about the middle of the 17th century (i.e. about 150 years after the first appearance in Italy in 1494 of Pacioli's printed *Summa*, and up to 350 years after the first Italian records believed to have been kept in full DEB) with a final refinement (the 'Four Feet' system, also known as 'Heaven and Earth Matching': *Tiān Dì Hé* 天地合) coming in the mid-18th century—although elements of 'reciprocal-entry' in accounting for movements in personal accounts and accounts for various commodities (the 'Three Feet' system) can be traced back to around the middle of the 15th century.

It is clear however that, in addition to their natural use of the Chinese-character writing system (rather than the Western alphanumeric system: see Appendix I), and of writing from top to bottom but in columns from right to left,[34] the CDEB books differed in other significant ways from the processing methods of DEB. Their physical layout placed entries for income and 'owing' accounts at the top of the page, and entries for outgo and 'keeping' accounts at the bottom. While DEB originally followed various

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of assisting the reading out aloud of the accounts, as in the medieval UK Exchequer 'audit' (literally 'hearing'—Hoskin & Macve, 1986).

[33] Confucius (551-479BC) was himself a lowly 'stores accountant' in a state warehouse in his poverty-stricken youth, and the story goes that Chairman Mao was familiar with his saying 'Accounts must be recorded correctly and accurately' (Guo, 1988a; Zhao, 1987: 166). In Confucian ethics, 'noblemen think about *Yì* (justice) while common people think about *Lì* (profit)', and desire for profit was seen as an evil for society (Gao and Handley-Schlacher, 2003: 49; Richardson, 1999: 66-7). However this has never stopped Chinese individuals, except perhaps in the Mao era under a different ideological repression, from being shrewdly practical about how to make profits (e.g. Gardella, 1992: 322; Brandt *et al*., 2011). It is now recognised that systems for marketing agricultural surpluses and agricultural family textile products were well developed by the 18th century and that successful merchants were an important economic group in China (e.g. Richardson, 1999: 16; 72), while the overseas (and Hong Kong) Chinese in particular have been exemplary business entrepreneurs, especially since the mid-nineteenth century (e.g. Gardella, 2000).

[34] Huang and Ma (2001:8) mistakenly transpose this to 'left-to-right'.

layouts in different cities (including 'top' and 'bottom'), the method which eventually became dominant was that used in Venice and described by Pacioli ('*alla veneziana*'), which placed the comparable Credit and Debit entries on opposite pages of the ledger, in the now-familiar 'T' account layout with Debits on the left and Credits on the right (e.g. Yamey, 2010a: 166).

More significantly, taking the illustration in Aiken and Lu (1998: 232), progress of entries through the three stages of the Chinese 'books' apparently required transcribing each entry *in full* each time. This was unlike DEB where, after transcription from the rough Waste Book to the formal Journal—which might at that stage involve compression into 'compound entries'—posting into a ledger account was effected largely by cross-referencing to the Journal, coupled with some (often abbreviated) identification of the *corresponding* ledger account. So in DEB a purchase on credit of calico cloth merchandise for £100, for example, might appear in the Journal (or a subsidiary purchases journal) as 'Dr. calico £100; Cr. X cotton mill £100', showing the cross-references to the folio pages of the respective ledger accounts; and then in the ledger account for calico inventory as a debit cross-referenced to the folio (or identifying number) of that journal entry and stating 'To X cotton mill' (maybe also referencing the folio of that ledger account), and in the ledger account for X cotton mill as a credit cross-referenced to the folio (or identifying number) of that same journal entry and stating 'By calico' (and maybe also referencing the folio of that ledger account).[35]

In CDEB apparently this entry (#1 in Aiken and Lu's example) would, in the equivalent of the 'journal' (*Xì Liú*),[36] also be entered in the same fashion as

[35] 'Compound entries' (used to reduce clerical effort and potential posting mistakes) would only be able to identify the original journal source, often appearing in the respective ledger accounts as 'To/By Sundries' or 'To/By Several Accounts' (e.g. Yamey, 2010a: 168-9). Again, if the double-entry ledger used 'control accounts' (e.g. for debtors, creditors, or inventory classes) only the 'control totals' would be posted from the journal and appear in the main double-entry ledger, while the related subsidiary day-books and ledgers containing the individual accounts and their detail would strictly be 'memorandum' books, further assisting the division of clerical duties and 'internal control' (e.g. Bigg & Perrins 1971, Chapter II). The use of such control accounts in Italy predates Pacioli's treatise by about 100 years, although he does not mention them himself (e.g. Macve, 1996).

[36] The authors writing in English give only a few Chinese characters (Gardella, 1982 and 1992, is a helpful exception, but giving the traditional character forms, not the simplified forms now used in PR China), and their pīnyīn Romanization often appears to contain typographical errors and always omits the four tone-marks that the pīnyīn system uses to help distinguish different Mandarin Chinese words that have the same letters. While the etymology is often obscure, we have included these tone-marks (and some characters, using the simplified forms), but only where they are indisputable (or at least appear to us to be clearly the most probable), so there necessarily remains some inconsistency in the degree of precision of our own presentation of the Chinese terms. As noted, we have had to rely on these secondary English-

'disbursement for calico T100' (in the bottom—i.e. *Fù* = pay—portion of the page) [≈ 'Dr.']; and as 'receipt from X cotton mill T100' (in the top —i.e. *Shōu* = receive—portion of the page) [≈ 'Cr.'].[37] However, in the equivalent of the 'ledger' (*Zǒng Qīng*) it would appear *in full again* in a *Cún,* i.e. 'keeping' [≈ 'Dr.'] account, as 'disbursement for calico T100' (in the bottom portion of the page) and in a *Gāi*, i.e. 'owing' [≈ 'Cr'] account as 'receipt from X cotton mill T100' (in the top portion of the page), instead of using DEB's posting method of simply cross-referencing the journal and the ledger. The visual structure within the CDEB 'books' and accounts was therefore quite different to that in DEB, which showed the reciprocal interrelationships, giving support to Aiken and Lu's observation (1998: 231) that the 'ledger' accounts for 'Keeping' and 'Owing' were not strictly equivalent to DEB accounts but represented *increases* of assets and liabilities respectively. In other words they were more like modern 'uses and sources of funds' accounting statements.[38] Our conditions of possibility 'A' and 'B' for Western DEB were not therefore reflected in CDEB; and the key 'differences that make a difference' from Western DEB are, first, the lack of the Arabic numerals that allow ready visual representation of the 'counting' of what is 'named' in the accounts and their summation;[39] and, second, the repeating of entries in full at each stage of processing in CDEB rather than DEB's system of gradual reduction through integrated cross-referencing.

Although 'profit and loss' statements and statements of inventory and personal balances are identified by most of the previous English-language authors, their expositions currently leave it somewhat unclear how the Chinese bookkeeping actually achieved any integration comparable to DEB's internal structure which formalizes the

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language sources rather than on identified original accounting records (or even secondary sources in Chinese) and we may have misinterpreted them. We have tried to avoid repeating their usage of terminology where it reflects modern accounting concepts that may convey a misleadingly anachronistic impression (such as 'revenue and 'expenditure' where there is no clear reason to believe that anything more than basic 'in' and 'out' transactions were being recorded—so 'income' literally means 'come in' or 'bring in' rather than the complex economic concept it now represents: e.g. Bromwich *et al*., 2010).

[37] We are here using 'T' to represent the monetary unit of taels of silver 银两 (pīnyīn: *yín liǎng*).

[38] However other authors (e.g. Lin, 1992; Auyeung *et al*., 2005; Guo *et al.* 2011) regard the ledger accounts as showing 'assets' and 'liabilities/equity', more comparable to Western DEB. They do not give any (legible) illustrations of actual account layouts or individual entries. Writing out entries in full would provide the customer/supplier's accounts in a form that could be used as evidence in settling disputes, which may have been their primary function.

[39] Cf. Appendix III for discussion of the special '*Sūzhōu mǎzì*' [苏州码字] number characters found in the 18th and 19th century Tǒng Tài Shēng merchant account books (and elsewhere) (Yuan, 2010).

equation 'profit (or loss) = change in net assets other than transactions with owners'.[40] The chart of the full CDEB system given by Lin (1992: 117) leaves it unclear which accounts in the *Zǒng Qīng* were for 'real' movements (such as changes in merchandise inventory) and which (if any) were for 'nominal' movements (such as 'sales' and 'purchases') that would be periodically transferred into 'profit and loss' and thence into equity.

In the case of the early 20th century Zìgòng brine-wells (which are argued by Auyeung *et al.* 2005 to illustrate traditional practices) the original *Zǒng Qīng* ('ledgers') that survive included nominal accounts for sales and expenses; but cash movements as such were not recorded ('Three Feet bookkeeping') so closing cash had to be counted and then reconciled with recorded sales and expenses. Brine and salt inventory movements were only recorded in quantities (as they had standard government-controlled selling prices), and their values, together with the values of other remaining supplies and expense prepayments, were then brought in at market price at the (monthly) period-ends as assets in the financial statements and as additional revenues (Auyeung *et al.* 2005: 84-7; 90-91).[41]

Even more significant from the perspective of economic history than the form of the accounts, it remains unclear just how far recognisable and/or comparable bases for calculating for calculating profits and valuing assets were established.[42] Again it is not apparent—as most papers do not give analyses of any identified original records—whether this uncertainty is due to lack of surviving records, or to difficulties in interpreting any that have survived. Clearly treating period-end expense deferrals and

[40] It is still a matter of choice within DEB systems how far matching of costs and revenues (e.g. by measuring cost of sales, depreciation and accruals and prepayments) is carried out continuously within the system or only at accounting period-ends when financial statements are to be prepared (Macve, 1985). Of course DEB can also be adapted to not-for-profit accounting as in its survival in Communist Russia (discussed further in Anon***, 2012; see also Chiapello & Ding, 2005) and in the 1716-26 recommendations of the Paris Brothers for French government accounting, where its main value would lie in its power to systematically integrate information originated from multiple and diverse lower-level sources of record-keeping (Lemarchand, 2010).

[41] It is not clear whether these monthly accruals and adjustments were formally entered into the book-keeping system or just adjusted for in preparing the financial statements; or similarly how opening balances were dealt with, although they were reconciled by the 'four pillar' balancing method (Auyeung *et al.* 2005: 90-91 and Figure 1). Nor is it clear whether profit shares and distributions were entered in partners' accounts or whether these only contained capital contributions (pp. 91-2). While their Appendix 2 gives a section from an 1869 partnership agreement that specifies the partners' profit shares, it does not include any specification of how the monthly profits are to be determined.

[42] The development of modern, consistent conventions (what we now call 'accounting principles') in the West was also a piecemeal process (e.g. Gardella, 1992, following Yamey, e.g. 1977).

the value of inventories and supplies on hand as *additional revenues* rather than *reductions of costs* (as found in the surviving records from Zìgòng discussed in Auyeung *et al*., 2005) would not be normal in modern Western accounting practice and, although in terms of technical book-keeping the effect on 'bottom-line' profit would be the same, this presentation does not appear helpful as 'management information' for understanding business performance.

How widely were these various systems used? Auyeung and Ivory (2003: 11) claim (following Guo's book in Chinese) that: 'During the Qīng dynasty the four pillar balancing method was used by the majority of commercial firms, regardless of their size. While the three-leg bookkeeping was employed by a minority of small- and medium-sized businesses, the dragon-gate [i.e. *Lóngmén*] bookkeeping and the four-leg bookkeeping were adopted only by a small number of large scale firms.' After all these developments they conclude that 'bookkeeping was mainly valued as a more effective memory aid rather than a means of determining business profit. Profits and losses were calculated on the cash basis and hence prepayments and accruals were generally not accounted for. There was no clear distinction between capital and revenue expenditures and no attempt was made to allocate capital expenditures to accounting periods by anything resembling the present-day depreciation'. On the other hand, Lin (1992: 116) argues that the *Tiān Dì Hé* system 'improved the calculation of cost of goods sold and earning determination', although he also says (p. 118) that amongst its weaknesses were 'lack of distinctive separation between capitals vs. liabilities, and capitals vs. earning'.

5. Evaluation of the historical significance of CDEB

The Chinese history that has been reported in Western literature to date has, with minor exceptions, followed a common pattern as set out above (see also Appendix III). We therefore conclude by commenting both on the bookkeeping developments and on the accounting principles that have been revealed, in the light of our main questions about possible transfers between the West and China and the significance of the accounting developments in both economic hemispheres.

Even though, as noted above, all interpretation and commentary remains severely constrained by the inability to access original accounting and other business records, nevertheless joint work by Western and Chinese accounting and business/economic historians on the archives that are gradually becoming available is beginning to enable a new interlingual / translational understanding of the significance of the accounting developments both in the West and in China and of the possible interactions between the two. In that process we wish, on both sides, to avoid terms such as 'relative sophistication' in seeking to understand and evaluate CDEB and Western DEB. However we have enough to support efforts (e.g. Hoskin & Macve, 2000; Fleischman and Macve, 2011) to continue to question the traditional view of accounting as adopted by many economic historians and expressed by Gardella (1992: 320; see also 1982: 62), who argues that 'technical changes in accounting practices have followed, rather than anticipated or determined, changes in the structure of Western economies…In this respect, at least, late imperial China and the West up to the mid-1800s appear to have shared common ground.'

We have argued first that Western developments cannot be simply understood as rational adjustments of technique to changing business and economic conditions. Yamey (e.g. 2005) has continued to warn us that Renaissance capitalism and its successors did not rely on rigorously kept DEB accounts for their success: it was useful but not essential (e.g. Macve, 1985) and there was more accounting than was needed for economic and business efficiency. This has led to our argument that its origins or genesis need to be sought outside the wholly commercial sphere, and instead focus on 'conditions of possibility' which affect in a more general way how humans think and act (and in the case of literate cultures write and read) in particular historical settings. This does not necessarily mean that if CDEB was to be seen as in some sense 'fully matching'

Western DEB we would need to find similar sufficient conditions in China. However, we suggest that it is helpful to take into consideration, in beginning an analytics of these two systems, conditions such as the differences in (A) textual presentation and (B) sign system (including the traditional writing of Chinese number characters), plus (C) the different institutional arrangements for education and examination at the highest level that lasted until 1905 (at nearly the end of Imperial rule), and the possibly different ways of thinking and acting that were therefore embodied and embedded in the literate knowledge experts who were an integral part of each polity and its economy.

Once DEB had arisen in Europe its power was gradually (albeit slowly) reinforced over subsequent centuries by becoming embedded in a range of institutions. Pacioli's *Summa* in 1494 began a succession of printed treatises that spread throughout Europe (including England and Scotland). Their authors and especially the teachers in commercial schools such as those in London (Edwards *et al*., 2009; Edwards, 2009) had a commercial interest in arguing for its merits. While 'trade' was always sneered at by the gentry, nevertheless the growing economic and political power of the middle classes in Europe (and perhaps especially England and the Netherlands) provided an environment in which financial, business and accounting skills acquired respectability as a 'useful' form of knowledge. Accounting even became a subject for artists (Yamey, 1989). Emigrants took these enterprising values, along with DEB, to America where it was further institutionalised in its new universities, academies and technical institutes. In France it was proposed in the early-18th century for Government accounting (Lemarchand, 2010). By the mid-19th century the emergent accounting profession (on both sides of the Atlantic) adopted DEB as a badge of its distinctive knowledge.[43] And respected economists and sociologists such as Sombart and Weber were further elevating its discursive status by asserting it to have been a key factor in Western development[44] so that its powers have now achieved an almost mythical status. In contrast, it is at this point difficult to find any comparable significant institutional or intellectual developments in Imperial Chinese economy and society that similarly reinforced the status and visibility of its indigenous accounting. Instead it appears to have remained essentially a set of textually based techniques for simple accounting (with

[43] We explore the development of industrial capitalism and modern managerial and financial capitalism further in Anon*** (2012).
[44] For doubts about claims that Marx shared these views, see Macve 1999; Fleischman and Macve, 2011 (cf. Chapman *et al*., 2009).

little evidence of how far there was systematic abstraction of information into higher-level accounts or analyses)—techniques that were simply passed on informally from one practitioner to another within a lowly regarded stratum of society with local improvements probably largely regarded as business secrets.

Second we have argued that the development of CDEB as explained by previous authors in Western literature still leaves many details unclear. The 'four column' balancing attributed to the Táng and Sòng dynasties (early 7th to late 13th centuries AD) seems no more advanced than that found in ancient Greek and Roman records and, while the tripartite processing from a 'waste book', through a 'journal' to a 'ledger' parallels DEB, in the absence of identification and clear reproduction of what original documents have been found it is hard to envisage precisely how the *Cǎo Liú, Xì Liú* and *Zǒng Qīng* were interrelated in a set of 'account books', and how the *Hóng Zhàng* (financial statements) were prepared from them. The descriptions available in English of even the most developed form of the CDEB *Lóngmén* system (the *Tiān Dì Hé* system) leave it unclear how far there was full integration and articulation of equity and correspondingly a profit and loss account and balance sheet that were an output of the system rather than a supplement to it.[45] Moreover the 'accounting principles' deployed for determining profits also appear to have remained confused and underdeveloped (although this was true in the West also until the rise of the joint stock company and the growth of external passive investment requiring financial reports on directors' stewardship and business performance (Yamey, 1977)).

Moreover, while there has been speculation by previous authors as to its uses for management decision making and control, there is little positive evidence for this given the absence of (i) supporting management correspondence, 'minutes' etc, and (ii) the lack of treatises or professional guidance to provide illustrations. There appears to be no evidence of any business entities combining some kind of staff office structure with the constant processing of accounting and statistical information that Chandler sees as

[45] Without seeing the original documents it is not possible for us to know the nature of any 'equity' accounts that may have existed, and whether any 'owners' equity' there may have been was equivalent to equity/capital in Italian DEB accounting. In conversation, Dr. Yuan Wei Peng has indicated to us that he has not yet identified equity accounts in the 18th-19th century Tǒng Tài Shēng account books (Yuan, 2010). Guo *et al.* 2011 identify 'equity' accounts but not until the Guangxu period (1875-1908) late in the Qīng dynasty, by which time practices 'had converged with Western bookkeeping'. We discuss the later accounts of the Zìgòng salt-mines (brine-wells) as reported by Auyeung *et al*., 2005, and comparisons with Japanese developments in the Meiji period, further in Anon***2012.

necessary to enact the kind of 'administrative coordination' that distinguishes the modern Western business enterprise from any predecessor entities, beginning in the US in the first half of the 19th century (Hoskin & Macve, 2000).[46] The potential for combined work by Chinese and English-language accounting experts on original Chinese records as they become available remains largely untapped here also.

Third, while we have been unable to identify any mechanism of historical transfer from China underlying the creation of Western DEB, we have also challenged the general acceptance by previous authors in Western literature that CDEB was a wholly indigenous development. Over the long period of the Míng and Qīng dynasties (mid-14th to early 20th centuries AD), given some international (especially from Guangdong province via Guangzhou [Canton]) and extensive internal trade (especially originating from the lower Yangzi region) there could have been a spreading among merchants and bankers of Western influences prior to the watershed of the Opium Wars in the 1840s (for example from the Jesuits[47] or even perhaps from Russian sources through connections with the Shanxi merchants and their banks, or along the 'southern silk road' through Yunnan province). It remains unclear what, if any, such influences lay behind the Chinese developments, including the claimed indigenous emergence of CDEB about the middle of the seventeenth century (i.e. some 150 years after Pacioli's *Summa* and up to 350 years after the earliest Italian examples of full DEB accounts, e.g. Macve, 1996). We concede however that no such international influences have yet been positively identified.

If CDEB is indeed an independent development does it change our view of the conditions of possibility for DEB's emergence in the West? We do not think so given that the stage of development achieved by CDEB appears to contain only as much 'duality' in processing transactions as is needed for the kinds of business being carried out. Bankers need to be able to record transfers in and out of customers' accounts, and traders buying or selling on credit similarly need to record the effect of purchases and sales, and

[46] Developments in China after 1850, and the possibility of interactions with US developments, are discussed further in Anon***2012.

[47] The Jesuits, who were active in China in the 16th and 17th centuries (beginning with the Italian Fr. Matteo Ricci's mission of 1582) and brought with them examples of 'Western' inventions (some of which had originally been Chinese but long forgotten there) were probably familiar with DEB. After the Procurator of the Sicilian Province, Ludovico Flori, wrote a treatise on DEB for its use in the Jesuits' Sicilian Colleges in 1636, it was then recommended for use throughout the Colleges of the Italian Assistance (Quattrone, 2004: 664).

then the offsetting payments and receipts in due course, in order to keep track of what they owe to suppliers or are owed by customers. Inventory acquisition needs similar dual recording. But while CDEB clearly contains this level of 'natural' or 'functional' double-entry, as currently understood it does not in any clear way go beyond this to a full integration and internal cross-referencing of the Western DEB type. While we remain open to being convinced by the discovery of further evidence from original records (or more expert interpretation of the existing evidence), our current view, on the basis of what the archive shows—but also does not show—is that such evidence/interpretation is unlikely to be forthcoming.

So finally how do we see CDEB's role in Chinese economic development? And does that change our understanding of the role of accounting, and in particular of DEB in the West during this period? For the period up to 1850 there is evidence now increasingly recognised by economic historians (e.g. Richardson, 1999; Yuan & Ma, 2010; Deng, 2011; Brandt *et al*. 2011) that the Chinese economy had an active merchanting and banking sector, with links to international trade, and that the bookkeeping and accounting systems that were developed were sufficient, if not to promote, at least not to inhibit the growth of that activity.[48]

Controversies over the extent of the marketisation of the Imperial Chinese economy seem likely to continue, as they have over the 'embeddedness' of the Ancient Greek and Roman economies (Macve, 2002). But just as in the latter cases it does not seem reasonable to believe that the absence of DEB was a significant brake on what market-oriented activity was developed (Macve, 1985), neither does it in the case of China. This is consistent with Yamey's sceptical view of the significance of DEB for capitalism's development in the Renaissance, and therefore also consistent with our view that the origins of DEB lay outside commercial needs, albeit that its precipitates included some favourable influence over those developments so that gradually it became itself so embedded an institution that ultimately (as is the situation today), it became almost impossible to imagine 'non-DEB' commercial accounting.

So the ultimate acknowledgement in China of Western DEB as 'superior' during the developments after 1850 (at least until the Communist era, and revived after Deng

Xiao Ping's 1978 reforms) may reflect as much changing power-relations and the rhetorics of 'modernization' (as undertaken in the West as well as within China itself) as any inherent technical superiority of DEB.

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[48] We consider further the issues relating to Chinese industrialisation and the advent of modern management in the early 20th century, and the reasons for the 'takeover' then by Western DEB, further in Anon*** 2012.

6. Conclusion and future research

We have contested three widespread views about the significance of bookkeeping and accounting developments in China in the period before about 1850. First we have reiterated the longstanding challenges to the currently re-emergent belief that DEB was significant in the development of Western capitalism—and have thereby undermined the motivation for finding its equivalent in China to support the recent re-evaluation by economic historians that the extent of Chinese economic achievement at that time was indeed impressive. Secondly we have challenged the claims in the extant English-language literature on Chinese accounting history that there was a Chinese version of DEB ('CDEB'), arguing that the development of bookkeeping and accounting there does not appear to have reached the level of integration and self–referencing that characterises DEB and that this is consistent with the very different textual traditions of writing words and numbers in Chinese to the visual forms of the alpha-numeric textual layouts that were a necessary part of the conditions of possibility for the original emergence of DEB in the West.[49] Thirdly we have queried how far the Chinese developments may have been indigenous and explored how far there may have been influences through trading or other relationships from (or to) the West (including possible familiarity with DEB). We have found more questions than answers.

Given these problematizations of the developments in both economic hemispheres, we have argued that any assessment of the institutional significance of the developments in the role of bookkeeping and accounting in pre-modern China needs to reflect the particular characteristics and history of Chinese political, social and economic organisation—and in particular its modes of visual representation of words and numbers—while being aware of possible interactions with Western influences. Our major handicap has been the current lack of access by English-speaking researchers to original archives of Chinese accounting records. There is now an urgent need for collaborative research between Western and Chinese accounting scholars and historians to share and debate understandings, insights and interpretations of what those archives may reveal and thereby bring more illumination to the arguments we have rehearsed

[49] Comparisons with the other Asian cultures that shared similar writing systems are explored further in Yuan *et al* (2012). See also Kudo and Okano (2011). Elman (2005) gives examples of how the visual representation of scientific illustrations brought by Western missionaries was given very different forms in the Chinese treatises that incorporated them. Understanding of the interrelationships between Eastern

here. At this stage one can only speculate on what a fuller understanding of these Chinese institutional traditions may imply for the nature and success of 'translation' of the modern Western-based apparatus of international accounting and auditing standards (e.g. Mennicken, 2008; Kettunen, 2011), for adoption in modern China.

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and Western modes of language, writing and picturing, and their consequences, will repay further theoretical and historical exploration.

Appendix I: Illustration of comparative visual forms of Western alphanumeric and Chinese characters

The same article from the English and Chinese versions of the Wall Street Journal online, 8 December 2009:

> Zhou Dewen, the head of the Wenzhou Small and Medium Enterprise Business Development and Promotion Association, told The Wall Street Journal that he estimates the combined losses of Dubai's 20,000 Wenzhou entrepreneurs at more than 1 billion yuan ($146.5 million).
>
> Since Dubai opened its real-estate market in 2002, the tiny desert oasis drew a huge influx of foreigners who came to invest and work. Of Dubai's current 1.4 million residents, the vast majority are expats and migrants. At the same time, housing prices in Dubai skyrocketed, with the average price for a villa rising from only 8,000 yuan per square meter in 2001 to more than 40,000 yuan per square meter before the financial crisis last year, according to Wang Weisheng, a Wenzhou merchant who has been doing business in Dubai for more than 10 years.

http://cn.wsj.com/gb/20091208/rec081804_ENversion.shtml

温州中小企业发展促进会会长周德文向《华尔街日报》表示，他估计在迪拜的两万名温州商人所遭受的总损失超过人民币10亿元（合1.465亿美元）。

自2002年迪拜开放了房地产市场以来，这个弹丸大小的沙漠绿洲吸引了大量外国人，他们来这里投资、工作。在迪拜现有的140万居民中，绝大多数是外派人员和海外移民。据一位已经在迪拜做了10多年生意的温州商人王伟胜说，迪拜的房价飙升，别墅的平均价格从2001年的每平方米仅人民币8,000元一直升到去年金融危机前的每平方米人民币4万元。

http://cn.wsj.com/gb/20091208/rec081804.asp

NB: The use of Arabic numerals in Chinese is a modern innovation. Traditionally the numbers would be written in characters too, so this text could appear as:

温州中小企业发展促进会会长周德文向《华尔街日报》表示，他估计在迪拜的两万名温州商人所遭受的总损失超过人民币十亿元 (合一亿四千六百五十万美元)。

自二零零二年迪拜开放了房地产市场以来，这个弹丸大小的沙漠绿洲吸引了大量外国人，他们来这里投资、工作。在迪拜现有的一百四十万居民中，绝大多数是外派人员

和海外移民。据一位已经在迪拜做了十多年生意的温州商人王伟胜说，迪拜的房价飙升，别墅的平均价格从二零零一年的每平方米仅人民币八千元一直升到去年金融危机前的每平方米人民币四万元。

So while there is some punctuation, there is no indication to the reader of the formation of compound words, or of dates (and other numbers) or of names (and in the case of Western names the Chinese equivalent is commonly formed from characters which are phonetically similar even though their literal meaning may be quite different (so here 'Wall' Street is *huá'ěr jiē* [华尔街]—literally 'prosperous (*or* Chinese) that (*or* you) street'—not translated literally as *qiángbì jiē* [墙壁街])). Moreover as there are generally no plural forms of words, or declensions or conjugations, those grammatical props to understanding in Western writing (as well as in speaking) are also absent.

APPENDIX II: Paper Money/drafts in China

Marco Polo's account of his travels to China in the last decades of the thirteenth century[50] describes how the Great Khan has paper money made from the bark of mulberry trees, to which Polo attributes the Khan's great wealth (1958 edn: 147-9).[51] Rectangles of different sizes of paper, to denote different denominations, are signed and stamped by the various responsible officials and sealed with the seal of the Great Khan. Forgery would be punished by death, as would refusal to accept it in payment, so that it is in general circulation throughout his empire. Traders and others who, several times a year, voluntarily or compulsorarily, bring precious stones, metals and materials to the Great Khan have their valuables valued by 'twelve experts' and then are paid in the paper currency. 'And all the Khan's armies are paid with this kind of money.'[52] Old notes that are growing torn and frayed 'are brought to the mint and changed for new and fresh ones at a discount of 3 per cent'. In later chapters Marco Polo mentions in passing

[50] We do not here enter the controversy over whether Marco Polo actually reached China or reported other travellers' tales: http://www.usnews.com/usnews/doubleissue/mysteries/marco.htm (*accessed 31.08.2011*)

[51] Latham's edition has consolidated Marco Polo's original 234 chapters of about a couple of pages each into 9 chapters. This account appears in Chapter 3 'Kubilai Khan' (*sic*), which comprises chapters 76-105 of the original. Hence Temple's (2007: 133) comment that Marco Polo devotes a whole chapter to the subject. Latham notes (p.147, fn.) that part of the description only appears in the 'R' manuscript, and that: 'This account of Chinese paper money, apart from its general economic misconceptions, raises several technical questions that are still unresolved.'

[52] The 'R' manuscript adds that 'the traders are allowed a profit on the exchange, and if they come from regions where the paper money is not current, they invest it in other goods that have a value in their own countries' (1958: 148, fn).

the fact that in Tibet the Great Khan's paper money is not used, while in the area of Kuiju '12 days by river' from Ch'êng-tu-fu [= Sindufu (modern Chéngdū)—capital of the province of Sichuan] it is the only currency in use (1958: 173; 192).

Needham (1985: 96-102) supplements Marco Polo's account under the Mongol Yüan dynasty with evidence of earlier issues. Paper money 'originated probably in the early +9th century,[53] when increasing needs of business and government transactions encouraged the institution of "flying money" (*fei chhien*)[54] as a convenient way to obviate carrying heavy metal from one place to another'. Proceeds of sales in the capital could be deposited and a certificate issued for cash in the designated provinces. 'The institution was originally a private arrangement by the merchants but was taken over by the government in +812 as a method of forwarding local taxes and revenues to the capital. Since the "flying money" was primarily a draft, it is generally considered a credit medium rather than true money. The system continued in the following dynasties and gradually evolved into a true paper currency'.[55] By the Northern Sòng [北宋] dynasty +1023 the notes were printed. Breaching of quantity limits led to more than one inflation and its ultimate demise.[56]

Needham (1985, p.99) comments that Chinese paper money spread to other areas in the late thirteenth century, 'but the use of bank notes was not begun in Western countries until the later part of the 17th century.'[57] Although nothing has been said about any accounting methods that may have complemented the systems for issuing and receiving the Chinese drafts and paper money, Needham nevertheless continues: 'It is probable that certain European systems of banking and accounting, as well as vouchers

[53] Needham uses '+' to signify 'AD'.
[54] = pīnyīn*: fēi qián* [飞钱]. More recent scholars agree that circulation of these money drafts and paper money (originally called *Jiāozi* [交子] and later *Qianying* and then *Huìzi*[会子]—Zhao, 1987: 177-179) among merchants, and then adopted by the state, appeared as early as the 9th century AD (Davies, 1994: 180-83; cf. Aiken and Lu, 1993: 178). This currency was used alongside more traditional exchanges made in coin, precious metals, grain etc.
[55] The Flemish Franciscan William of Rubruk's expedition of 1253-4 to the Great Khan did not quite reach 'Catai' (= 'Cathay', i.e. North China) but reported: 'The ordinary money of Catai is a piece of cotton cloth, as long and wide as a hand, on which lines of writing are impressed and also the seal of Mangu. The inhabitants of Catai write with a brush such as painters use, and they include in a single character several letters, forming a word' (Franke, 1967: 10).
[56] Needham (1985: 96) cites *inter alia* Yang Lien-Sheng (1952: 51-2). See also Brandt *et al*. (2011).
[57] Needham's footnote here says: '…Sweden in 1661; America 1690; France, 1720; Russia, 1768; England, 1797; and Germany, 1806.' The reference to England must be to the introduction of £1 and £2 notes that year in response to the shortage of gold, as the Bank of England had been issuing forms of banknote since its foundation in 1694 (Bank of England: http://www.bankofengland.co.uk/banknotes/about/history.htm (*accessed 31.08.2011*).

for deposited money, were also influenced by Chinese examples obtained by merchants and travellers to China.'[58] But there seems to be no actual evidence for these claims.

The Manchu (Qīng) dynasty did not use paper notes for currency, and '[i]t was not until the later part of the 19th century that a Chinese bank issued a new bank note, which was inspired primarily by Western influence.'(Needham, 1985: 102).

[58] Needham's footnote here says: 'Max Weber said that the accounting system (*Verrechnungswesen*) of the old Hamburg Bank was based on a Chinese model, and Robert Eisler said that the old Swedish system of banking and money deposit vouchers followed the Chinese system' (citing Yang, 1952: 65). Hence Temple's (2007: 133) even stronger formulation: 'The Old Hamburg Bank and the Swedish banking system were set up on Chinese lines. Thus, some of the fundamental banking procedures of the Western world came from China directly.' Needham's and Temple's observations are disputed but we have not pursued the historical arguments here.

APPENDIX III: STAGES IN THE HISTORICAL DEVELOPMENT OF CHINESE BOOKKEEPING

An outline of the detailed stages that are set out by the researchers writing in English, as summarised in Section 4, is as follows:

1. The first bookkeeping, found from the Western Zhōu dynasty (1100-771BC)—where government accounting was far more advanced than any non-government accounting—was single-entry and used a kind of rough memorandum/waste book, the *Cǎo Liú* to jot down transactions (in quantities not money) as they occurred for subsequent classification in a set of accounts, the *Zǒng Qīng*, under various transaction categories of receipt (*Rù* [入]: 'in') and disbursement (*Chū* [出]: 'out'). The difference between *Rù* and *Chū* gave the balance of the account (this was called the 'Three Column' or 'Three Pillar' balancing method),[59] as in all Chinese accounting records, the writing, written from top to bottom, was in columns arranged from right to left. Aiken and Lu (1993) and Li (2007) describe the hierarchy of government officials, the organization of the government accounting system and the kinds of taxes and tributes collected and how their collection and disbursement were recorded and audited.[60]
2. Following the standardisation under the first Qín emperor (Qín Shǐhuáng [秦始皇], who ruled 221-210BC)—who standardized *inter alia* the writing characters, a currency unit and a system of weights and measures, and introduced coinage (as well as creating the famous Terracotta Army to guard his tomb at Xi'an (Wood, 2008))—accounts could also be kept in money terms. Despite Confucian distaste for activities aimed at profit (*lì* [利]) and legal discrimination against merchants,

[59] *Sānzhù jiésuàn* [三柱结算]. According to Lin (1992: 106-7; 2003: 85) the balance was called *Yú* [余] and the accounts also included 'net worth'. However, it is not clear how 'net worth' could be calculated if only physical quantities were being recorded. If there were inventory-type or liability-type accounts as well as receipt and payment accounts, it is also unclear how opening balances would have been dealt with at this stage in order to check the accounting accuracy. That would appear to need the later 'four column' balancing (stage 4 below). [In conversation (November 2011) Prof. Guo Daoyang has indicated that initially each period's account was regarded as conceptually separate: opening balances had to be extracted as required from the preceding period's books. However problems of loss and theft of records led accountants to recognise the need for continuous records and to incorporate the opening balance in the new period's books, thereby inventing the 'four column' system.]

[60] Presumably all in kind, including any silver and other precious metal as 'bullion', although cowrie shells (*bèi* [贝]), which have also been so used in many other cultures (Davies, 1994: 36), were already in use as a form of currency. Metal currency objects did not appear before the Eastern Zhōu dynasty (770-256 BC)

non-government accounting for commercial activity grew and used the terms *Shōu* [收] for receipt and *Fù* [付] for disbursement. Apparently accounts receivable and payable classifications also appeared.[61]

3. By the end of the Eastern Hàn dynasty (25-221AD) paper was used and the abacus had become popular.[62] According to Lin (1992: 106), followed by Sohas and Ayhan (2007: 164), the concept of 'profit' (but not yet a process for determining it) had appeared in Chinese literature.
4. During the Táng and Sòng dynasties (618-907; 960-1279AD), when commerce became less restricted, both government and non-government units now used either the terms *Rù* and *Chū* or *Shōu*[63] and *Fù* for income and outgo. Accounting reports were required at regular periods and were now in a regular, usually 'Four Column' (or 'Four Pillar'), form showing a) Opening Balance, b) New Receipts, c) New Disbursements, and d) Closing Balance[64] (so 'balancing' checked either that a) + b) = c) + d); or equivalently that b) - c) = d) - a); or a) + b) - c) = d)). However, it is not clear whether/how far this involved going beyond confirming

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and coins not before the Qín dynasty (221-210BC): http://primaltrek.com/chinesecoins.html#Introduction_and_History (*accessed 02.09.2011*).

[61] Zhao (1987: 168-9) dates debtor/creditor contracts to the preceding centuries, including the use of *Qì* and *Quàn*, inscribed on bamboo or wood, with one part held by the debtor and the other by the creditor as evidence of the contract (in a similar manner to tallies, e.g. Baxter, 1994). Bound together such *Qìquàn* [契券] became a 'ledger' of accounts receivable and payable.

[62] Before paper, the account 'books' (*bùshū*) were made of bamboo slips or silk pieces (Zhao, 1987: 174; Guo, 1988a). Aiken and Lu, 1993:173 illustrate a bamboo slip 'roll' (which is presumably a facsimile of an original although no source is identified). According to Zhao (1987: 175) the preceding bamboo slips used for recording might be bound together either chronologically (to act like a 'journal') or by classification (to act like a 'ledger' account). Guo *et al.* (2011) refer to the earliest accounts being on wood (*Jian Ce*). While China has been credited with the invention of the abacus (*suànpán* [算盤], lit. 'counting tray') (e.g. Zhao, 1987: 174-5), this is still contested as similar technologies were used by the ancient Greeks, Romans and other even more ancient civilizations. http://en.wikipedia.org/wiki/Abacus#Mesopotamian_abacus (*accessed 02.09.11*). Zhao (1987: 168) refers to identification of similar calculating devices as far back as the Western Zhou dynasty.

[63] Confusingly, Aiken and Lu, 1998 sometimes use '*Shou*' and sometimes '*Sou*' (which has no relevant meaning in modern Chinese).

[64] The descriptions by Lin (1992: 107-8; 2003: 85), Auyeung and Ivory (2003: 10) and Guo *et al.* (2011) of the method (*Sìzhùfǎ* [四柱法] or *Sìzhù jiésuàn* [四柱结算]) indicate these were labelled respectively *jiùguǎn*, *xīnshōu*, *kāichū*, *shìzài*. While Guo (1988b: 6) claims that, using this 'world famous' method, 'the application of these accounting equations in China was several hundred years earlier than that in the Western world' it is unclear what, if any, technical advance they represented over the processing and balancing of inventory accounts (e.g. of grain, wine, animals) and cash accounts to be found on the Zenon estate Egypt in the 3rd century BC, in Roman farm accounting in the second century AD, and on the Appianus estate in Egypt in the mid-3rd century AD (Rathbone, 1994: 59), although in Europe these written forms may have been lost and had to be 'rediscovered' in the Middle Ages (Jack, 1966: 139-40). While one must respect the 'archaeology' of concepts (e.g. Gutting, 2005), to modern eyes, at least, these arithmetical relationships between accounting for stocks and flows seem 'only natural'—and indeed still underlie the 'asset/liability' approach to measuring income in accounting as now propounded by accounting standards setters (e.g. Bromwich *et al.*, 2010: 360).

the internal consistency of the accounts to 'audit' verifications of the closing balances).[65] Some famous examples of government reports included comparisons with the previous year and explanations for income and outgo variations (Aiken and Lu, 1993: 179-80).[66] Commercial activities and credit expanded and paper money appeared (Lin, 1992: 106-7).[67] Trade reached the Mediterranean and then Continental Europe (Aiken and Lu, 1993: 178)—although we presume this was through intermediary traders—where by the end of the thirteenth century researchers have argued the earliest examples of Italian DEB have been identified (e.g. Macve, 1996).

5. During the Míng and Qīng dynasties (1368-1644; 1644-1911AD, i.e. until the end of Imperial rule) commerce expanded yet further[68] and it is claimed that CDEB emerged, although single-entry bookkeeping still dominated. By now, in between the *Cǎo Liú* and the *Zǒng Qīng*, there was the *Xì Liú*.[69] The *Xì Liú* organized the account entries from the *Cǎo Liú*, still chronologically (*liúshuǐ zhàng* [流水账]: 'running water recording'—Lin 1992: 105), into a 'top' and 'bottom' layout for their *Shōu* and *Fù* aspects respectively. It was usually updated from the *Cǎo Liú* daily, and totalled every ten days (*xún* [旬]): one third of a lunar month), every (lunar) month (*yuè* [月]) and every year (*suì* [岁]).[70] From it 'postings' were made to the *Zǒng Qīng* (although these 'postings' actually

[65] Lin (1992: 108) refers to Guo's 1982 book [in Chinese] as reporting that the complete books of the Jìngtǔ Temple in Central China were kept by this method in 925AD.
[66] Zhao (1987: 176-8) notes that during the Western Wèi dynasty (535-557AD) official forms had 'stipulated red characters for payment and black for income'; while during the Táng dynasty simplifications in summarization were introduced which reduced the enormous volume of individual records submitted to the central government, together with significant improvements in audit with the establishment of the *Bibu* as an inspection department.
[67] This paper currency was used alongside more traditional exchanges made in coin, precious metals, grain etc. While accounting for 'cash' transactions is discussed and illustrated by various authors (see below), it remains unclear to us both the extent to which economic transactions would have been monetized at different periods, and how any transactions involving paper money/drafts would be recorded, i.e. whether as a 'cash' or form of 'credit' transaction.
[68] Zhao (1987: 181) describes a very large grocery for delicacies in Sūzhōu that lasted for over three hundred years. It had six departments, with defined managerial responsibilities under the general manager, and used what was to become a common system of internal control worldwide, i.e. that customers made payment only to the 'cashier' in exchange for a warrant to collect the goods from the department(s) where they had purchased them.
[69] All three 'books' had several alternative names (Gardella, 1992: 324-6; Lin, 1992: 107; Aiken and Lu, 1998: 227). Aiken and Lu (1998: 228) explain how the paper was pleated in the case of *Cǎo Liú*, and ruled in the case of *Xì Liú* and *Zǒng Qīng*, to give the necessary columns and, in the case of *Xì Liú* and *Zǒng Qīng*, to show receipt entries in the top portion of the page and payment entries in the bottom portion.
[70] These Chinese terms are given by Guo (1988b: 2).

appear to have involved writing out the original entries in full yet again, but now marshalled under the *Zǒng Qīng* 'ledger' account headings).

6. With increasing commercial and credit activities, financial statements—*Hóng Zhàng*—calculating 'cost, profit and loss'[71] were prepared from the accounts in the *Zǒng Qīng*, normally for distribution at Chinese New Year.
7. An intermediate framework, before 'full' CDEB emerged, was the 'Three Feet' (or 'Tripod', 'Three Leg', or 'Lame' bookkeeping system—*Sānjiǎoshū* [三脚书] or Bǒjiǎo Zhàng [跛脚账].[72] Auyeung and Ivory (2003:10) and Lin (1992: 109) date this to the mid-fifteenth century. While it still used single-entry for cash (*Yín* [银]: 'silver') transactions, it developed a form of double-entry for non-cash transactions. Moreover, according to Aiken and Lu (1998: 230) the latter were apparently treated 'as if' the transaction had first involved a receipt/payment of (the notional) cash for the item and then a settlement in (the notional) cash.[73] The actual cash movements were recorded in one or more cash day-books/journals[74] from which, using the pre-existing 'Four Column' method, the actual cash balance could be obtained.

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[71] Without seeing original accounts it is not possible for us to know whether 'profit' here meant any more than a surplus of receipts over payments, and *vice versa* for 'loss'.

[72] We use 'Three Feet' (and correspondingly 'Four Feet' for the later full CDEB system) as the translation for this bookkeeping system, to avoid confusion with the 'Three Column' and 'Four Column' methods for calculating the balances on individual accounts.

[73] Aiken and Lu, 1998: 230 give the (somewhat unusual?) example of settling an account payable for firm B in silk, requiring 'Receipt: silver from silk' followed by 'Disbursement: silver to B firm'. So there may be an alternative interpretation, as presumably a purchase on credit of silk from B firm would be recorded by the reverse of these two entries, which would appear indistinguishable from the example of a credit purchase of calico from a cotton mill given as transaction #1 in the example of the full *Lóngmén* CDEB system that they describe next. So it seems to us that the 'notional cash' transaction in the 'Three Feet' system might also represent no more than the fact that a credit sale transaction is being recorded in money units, i.e. taels of silver 银两 (pīnyīn: *yín liǎng*) for both the inventory item and the (previous) creditor.

[74] According to Lin (1992: 109) and Auyeung and Ivory (2003: 10), there were two such cash journals, the *huoqing bu* (cash sales and purchases journal) and the *yinqing bu* (cash journal); while a third journal, the *wanlai bu* was the 'personal account and transfer journal'. It seems natural that the last would have to reflect a double-entry for the transactions, as in Western accounts for debtors and creditors (and especially banks) before full DEB (e.g. Lee, 1994). Without access to the original documents, it is not clear to us whether 'sales and purchases' were focussed on the revenue/cost aspects ('nominal' accounts in DEB, pending transfer to the profit and loss account) or on the outflow and inflow of inventory aspects ('real' accounts in DEB which remain in the balance sheet). As *huò* now primarily means 'goods/commodities' (although it can also mean 'money') the word is probably *huòqīng* [货清] and probably means 'goods settlement', suggesting a focus on the movements of physical inventory out and in. Gardella (1992: 326) refers to a 'stock ledger that listed the quantities and values of incoming merchandise' at the famous *Ruìfúxiáng* [瑞蚨祥] department store chain (sometime from the end of the nineteenth century onwards) and observes (p.326) that 'accounts were customarily kept in permanent ("real") rather than temporary ("nominal") terms'. Inventory accounting in DEB also is not straightforward and can be 'continuous' or 'periodic': Stoner (2010) comments on the peculiarities of the method of 'continuous inventory accounting' recommended by Pacioli which credited sales at sales price to each merchandise inventory

8. Lin (1992: 110) comments that under the Three Feet system profit and loss calculations 'were either ignored or calculated by the very crude method of "Total of receipts (inflow) compared against total of disbursements (outflow)" '. He labels these (2003: 86) *Lái Zhàng* [来账] and *Qù Zhàng* [去账] ('come to account' and 'go to account'—which terms appear respectively within the individual entries classified under *Shōu* [收] and *Fù* [付] in the example given by Aiken and Lu (1998: 232) of the later full CDEB *Lóngmén* system.
9. About the middle of the seventeenth century (late Míng / early Qīng dynasties) the most significant commercial bookkeeping development appeared—the *Lóngmén* ('dragon's gate')[75] CDEB system. It was supposedly invented by Fu Shen, a merchant from Tàiyuán, the capital of Shānxī Province in northern China. (How far there may have been any foreign influences at work is unclear.)[76] While it retained the three kinds of existing records (*Cǎo Liú, Xì Liú*

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account, yielding the profit when all the inventory had been sold but causing difficulties for profit and balance sheet measurement when items still remained in inventory at the accounting date. Nowadays this problem is solved either by making transfers out to a nominal 'cost of sales' account as sales take place ('continuous') or by entering the cost of closing inventory at the accounting date as the closing balance, leaving the residual 'cost of sales' to be transferred to the trading and profit and loss account.

[75] The etymology is obscure. Although Zhao (1987: 181) does not translate it, *Lóngmén* is translated as 'dragon's gate' by Gardella (1992: 324), Chen (1998: 77), Huang and Ma (2001: 8) and Solas and Ayhan (2007: 164); and Aiken and Lu (1998) give the corresponding characters [龙门] in their example at p. 232, as does Yuan (2010), while Zhao (1987: 191) and Gardella (1992: 335) give the equivalent 'traditional character' form. However Lin (1992: 111) translates it as 'embankment', as balancing the accounts was *Hé Lóngmén* ('close the embankment/bridge', by analogy with bringing together the two ends of an embankment/bridge that was being built from each end, cf. our 'make the two ends meet'). (Arguably this analogy could reflect the ideas of *Fēng Shuǐ* (e.g. Gao and Handley-Schlacher, M., 2003: 54; Solas and Ayhan, 2007: 160.) However in conversation Dr. Yuan Weipeng has suggested it may refer to the kind of traditional accounting office desks he has seen (in a commercial building museum in the Huīzhōu [徽州] region of Ānhuī province) where two separate semi-oval desks used by different clerks are brought together at the new-year Spring Festival (*Chūnjié* [春节]) to make one oval desk when the accounts need balancing.) *Hélóng* [合龙] (despite using the 'dragon' character) has the same meaning of 'join together the embankment/bridge' in modern Chinese (although the stand-alone character for an embanked path is *lǒng* [垄]). However, Chen (1998: 77) translates it as 'close the Dragon Gate'. *Héjì* [合计] (which also appears in the Aiken and Lu (1998: 232) example) means 'to total', while another character, *lǒng* [拢], is also used in modern Chinese to mean 'sum up (accounts)'. Auyeung and Ivory (2003: 10-11) use both translations at different points. The examples in Aiken and Lu, 1998: 232-6 of the *Lóngmén* system and the later 'Four Feet Bookkeeping System' appear to be illustrative not actual records; in the former (as in Zhao, 1987: 191; Gardella, 1992: 334-5) the character 帐 for *zhàng* (now meaning 'curtain/tent') is repeatedly used instead of the normal 账 for *zhàng* ('account'), which is used by Yuan and Ma (2010), and which incorporates the 'phonetic derivative' of 贝 for *bèi* ('cowrie [shell]')—i.e. the original medium of currency in antiquity—in order to provide the 'radical', i.e. the representation of the meaning. That the alternatives may simply reflect some accidental confusion of two similar radicals in writing the simplified characters seems unlikely as in their traditional form the radicals appear quite different, In conversation Dr. Yuan Weipeng has suggested that the use of帐may reflect the writing of early accounts on material such as silk.

[76] His name is given in this form by Aiken and Lu (1998: 230, fn.8), but alternatively as Fu Shang by Lin (2003: 96, fn.1) and Song (2011: 324) or Fu Shan by Auyeung and Ivory (2003: 10) and Auyeung *et al.* (2005: 88)—who describe him (without giving a source) as 'both a merchant and a scholar of philosophy,

and *Zǒng Qīng*) it added the rule that every *Shōu* must appear with an equal *Fù;* and it classified the account titles into four categories: Receipt, Payment. Keeping, and Owing (each with sub-categories). The examples given by Aiken and Lu (1998: 231-234) illustrate its basic principles for recording some transactions.[77] A feature of the *Zǒng Qīng* is that its classification of accounts gives the equivalent of what would be 'credit balances' in DEB for *Jìn lèi* (Receipt type) and *Gāi lèi* (Owing type), all headed *Shōu*, at the top of the 'page'; and of 'debit balances' in DEB for *Jiǎo lèi* (Payment type) and *Cún lèi* (Keeping type), all headed *Fù*, at the bottom. However, according to Aiken and Lu (1998: 236), the accounts 'classification is based on the results of activities, not on the transaction contents'. So *Cún* and *Gāi* are not strictly equivalent to 'asset' and 'liability' accounts as a cash payment (transaction #3 in the example) results in a closing

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literature and medicine'—as well as by Chen (1998: 77). 'Shānxī 山西 merchants 晋商(pīnyīn: *jìnshāng*) constituted a historical phenomenon that lasted for centuries from the Sòng to the Qīng Dynasty. Shānxī merchants ranged far and wide from Central Asia to the coast of eastern China; by the Qīng Dynasty they were conducting trade across both sides of the Great Wall. During the late Qīng Dynasty, a new development occurred: the creation of *piàohào* (票号), which were essentially banks that provided services like money transfers and transactions, deposits, and loans. After the establishment of the first *piàohào* in the city of Píngyáo [the *Rìshēngchāng* (日升昌) in 1823, whose building still survives as a banking museum and which had branches all over the country], the bankers in Shānxī dominated China's financial market until the collapse of Qīng Dynasty and the coming of British banks' http://en.wikipedia.org/wiki/Shanxi (*accessed 02.09.11*). Morck and Yang (2010), who note that earlier dates have also been suggested for foundation by Li Daquan of the *Rìshēngchāng* (which they name as the 'Sunrise Provident Bank'), suggest that as the tea trade of Shānxi merchants ultimately reached St. Petersburg (via the border trading post with Russia of Kyakhta, that was opened to private merchants in 1762), 'a strong case can be made that Western banking diffused into Shanxi via Russia' (in which case we would suggest that their bookkeeping practices may have been introduced from Russia too: although we do not know how far DEB had been adopted in Russia by then—Sokolov & Sokolov (2011: 813) indicate that 'the double-entry accounting system came into our lives during the 18th century reforms' [i.e. of Peter the Great]). Ji (2003: 75) comments that during the Qīng dynasty 'Accounting in private lending shops (*JianZhuang*)…in private exchange shops (*Piaohuao*), and …in Pawn shops (*Diandong*) all advanced and were well organized' However Lin (1992: 109; 2003: 86) dates the emergence of 'Credit unions' (*Qianzhuang*), 'Pawnshops' (*Danpu*) and 'Banks' (*Piaofen*), alongside early 'capitalist' mining and manufacturing ventures, to the Míng dynasty around the fifteenth century, thereby contributing to the evolution of the *Lóngmén* CDEB system which (by also classifying the 'Three Feet' (or 'Lame') bookkeeping as an early stage of *this* system, rather than a precursor) he now dates to the late 15th century (i.e. contemporaneous with Pacioli), whereas previously (1992: 111) he also accepted the late Míng/ early Qīng dating for the *Lóngmén* system given by other scholars, i.e. broadly late 16th to 17th century. Song (2011: 324) also now follows this late 15th century dating. According to Auyeung *et al.* (2005: 85), Guo's book (in Chinese) argues that 'the growth in interregional trade and commercial banks, called *qianpu* or *qianzhuang*, during the Ming dynasty was the impetus behind the invention of double-entry accounting'. However, Guo (1988b: 7-8, in English) dates the emergence of CDEB and the *Lóngmén* system to 'the end of the Ming dynasty and the beginning of the Qing dynasty' (about 1644 A.D.) and Guo *et al.* (2011) give an example of a 'silver receipts and payments' annual report from a pawnshop in the Wànlì period (1563-1620, i.e. towards the end of the Míng dynasty).

[77] Lin (1992: 112-3) also illustrates some transactions but, while Exhibit 1 on p.113 is correct, his description of transaction #2 on p.112 has reversed the correct positioning of the entries on the page.

'Owing account' for the *yín gùi* ('silver cupboard' / 'safe').[78] Indeed they appear to us more like modern 'Uses' and 'Sources' of Funds accounts[79] and Lin (2003: 96) notes that the somewhat similar 'increase-decrease' system introduced in PR China in the 1960s to 1980s (which we discuss further in Anon***, 2012) 'is a continuing innovation of the traditional Chinese-style bookkeeping'. However Lin (1992: 111ff.) clearly regards the accounts for *Cún* and *Gāi* as equivalent to asset and liability/equity accounts in DEB.

10. The *Zǒng Qīng* account categories contained both the individual transaction entries—apparently repeated in full, rather than merely with the amounts cross-referenced to the *Xì Liú*—and totals for each category (Aiken & Lu, 1998: 232). It was therefore visually unlike a DEB ledger where the entries are simply cross-referenced to the journal and indicate the *reciprocal* ledger account (e.g. Yamey, 2010a).
11. Checking that the accounts 'balanced'—*Hé Lóngmén*—was accomplished by checking that the total of (Receipt-Payment types) = the total of (Keeping-Owing types).[80] It is not clear whether any 'profit and loss' accounts were derived automatically from the system or calculated as a separate exercise. However, Lin (1992: 113-4), who gives two alternative equations for calculating profit (Total

[78] *Cún* is used in modern Chinese for a deposit (as in a bank deposit account)—Yamey (2010a: 171) reminds us that Pacioli insisted that the cash account can never have a credit balance. *Gāi* is used to mean 'owe'. Aiken and Lu (1998: 228) initially translate *Cún* as 'assets' and *Gāi* as 'liabilities/owners' equity', as do Lin, 1992: 111-12 and Auyeung and Ivory, 2003: 10-11, but none of these authors give any examples of an 'equity' account.

[79] However, as there is only one entry to any one account in Aiken and Lu's (1998) example it is not clear how net balances would appear; and as entries from only one period are illustrated it is not clear how 'opening' and 'closing balances' were handled in 'closing (and reopening) the books'.

[80] It is not obvious why the arrangement on the page of the *Zǒng Qīng*, as illustrated by Aiken and Lu (1998: 232), does not put the *Jìn lèi* above the *Jiǎo lèi* (and similarly the *Gāi lèi* above the *Cún lèi*), which would make this reconciliation of the balances more visually obvious, but instead places them diagonally opposite each other. We conjecture this may possibly have been to preserve the 'right to left' reading order of the *Shōu* and *Fù* entries in the original *Cǎo Liú.* (Unfortunately Aiken and Lu present the English transcription of their Chinese example in Western DEB's 'left-right' layout—albeit with the equivalents of 'Credit' on the left and of 'Debit' on the right—rather than in the original CDEB 'top-bottom' layout, so readers have to make their own mental transpositions.) Aiken and Lu's diagram of 'the accounting circle (*sic*) under the *Lóngmén* system' in Figure 3 (1998: 234) ends with a '*Positive ledger*' but no Chinese term is given and no explanation of what it represents or its function. Practice may have varied: Lin (1992: 114) had previously described the trial-balancing as involving transcription of all the ledger entries (apparently individually yet again) into a special 'Trial Balance of Totals' book called *Lóngmén Bù*, again with all *Shōu* entries in the upper section (organized by *Jìn* and *Gāi* accounts) and all *Fù* entries in the bottom section (organized by *Jiǎo* and *Cún* accounts), so that balancing (*Hé Lóngmén)* similarly required that the total of (Receipt-Payment types) = the total of (Keeping-Owing types). (Again, it is unclear how opening balances were dealt with to achieve this equation.)

Jìn - total *Jiǎo*, or equivalently total *Cún* - total *Gāi*),[81] argues, presumably again following Guo's book, that 'merchants calculated the cost of goods sold before closing the books at the end of each period' by one of two methods. The first was by appraising closing inventory and then deducting the closing balance from (total purchases + beginning balances). However Lin (who himself here mistakenly reverses the signs, as also do Solas and Ayhan, 2007: 159) does not say how the closing inventory was valued for this purpose. The second method was by valuing the units of goods sold using the highest price paid for purchasing merchandise during the period. Like modern-day LIFO in a period of rising prices, this would increase the amount for cost of goods sold and lower the profit and ending 'balance sheet' value. Lin says this 'conservatism' apparently benefited merchants and this method was the most popular, although he does not explain what the benefits were perceived to be (for example, it is not clear what, if any, taxation or contracting consequences might follow, although the example of the secret reserve accounting at the famous *Ruìfúxiáng* department store chain, sometime from the end of the 19th century, indicates that owners may have lowered reported profits to minimise the amounts to be paid to managerial staff under profit-sharing agreements (Gardella, 1992: 330).[82]

[81] In which case here *Gāi* must mean only 'liabilities'—albeit presumably plus any *previous* equity—if the difference is to equal an increase in equity representing profit. Huang and Ma (2001: 8), who refer only to asset and liability movements within the accounts, merely say: 'This balancing method of calculating the profit for the year was described as "settling *Longmen*".' Gardella (1992: 324) equates *Gāi* with liabilities and says that 'at the end of the year, the profit or loss from subtracting expenses from income had to tally with that obtained by deducting liabilities from assets', which leaves the same lacuna about accounting for the opening balance of equity. The same problem remains in the exposition by Guo *et al*. (2011).

[82] Aiken and Lu (1998: 228-9) had previously said, in relation to what they called the earlier 'single-entry' system, on the one hand, that *Shōu* and *Fù* only represented cash flows, and on the other that if 'the amount of *Cún* exceeded *Gāi* a profit was made' (in which case here again *Gāi* must mean only 'liabilities'—presumably plus any *previous* equity—if the difference is to equal an increase in equity representing profit). They give no information on how *Cún* and *Gāi* were valued. Auyeung and Ivory (2003: 11) are similarly ambiguous about how profit was determined through the balancing in the *Lóngmén* system. Neither of these papers comments on Lin's (1992) exposition, and nor does Lin (2003). Lin (1992: 115) concludes his discussion of the *Lóngmén* system by observing that there was a 'lack of an integrated account system. Particularly, the links between nominal and real accounts were indistinct and the use of nominal accounts was not fully understood. Also the limited number of general ledgers in use seemed insufficient for a comprehensive accounting of financial positions and operating results.' However, he does not expand on these brief comments or give any examples from original records. Gardella (1992: 325-6) summarising what 'was a mundane, pragmatically evolved tradition' notes in similar terms: 'Calculations of profits and losses, as opposed to periodic balances, were usually done by larger firms. If the profit/loss figure did not jibe with the balance, the discrepancy might be naïvely indicated as such (*bùfú* [不符]) or as a "surplus" (*yíngyú* [盈余])! Accounts tended to be weakly integrated with one another,

12. The form of accounts, and methods of creating 'columns' on the 'page' of paper, varied between the various records but in all cases (except in the memorandum *Cǎo Liú*) the *Shōu* items appeared in the top section and *Fù* items in the bottom section of the page, with Chinese characters being used (i.e. the numbers and the descriptions were written in the same textual format).[83] As noted above, according to the illustrative example given by Aiken and Lu (1998: 232), transferring entries through each stage of books actually involved writing out the original entries in full each time, finally marshalled under the *Zǒng Qīng* 'ledger' account headings (but in a different manner to that used in DEB, which was based on *cross-referencing*).[84]

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and the proliferation of similar account subclassifications could lead to a junglelike undergrowth, unnecessarily complicating ordinary business operations.'

[83] Solas and Ayhan 2007: 164, following Auyeung and Ivory (2003: 9-10) who give no source, distinguish three kinds of 'number' characters as being used during the Míng-Qīng period (1368-1911): *cǎomǎ*, the commercial forms; *hàntǐ*, the standard forms, and *kuàijì tǐ,* the accounting forms: used in the *Cǎo Liú*, *Xì Liú*, and *Zǒng Qīng* respectively. However, the example given by Aiken and Lu (1998: 232) shows just the two forms normally recognised to this day, i.e. the simpler characters in the *Cǎo Liú* and *Xì Liú* (e.g. 二for *èr* (two)) and the traditional more complicated characters (e.g. 貳for *èr*) in the *Zǒng Qīng*—characters that are still used nowadays when writing cheques etc. as a precaution against fraudulent alteration. Auyeung *et al.* (2005: 82-3) observe the *cǎomǎ* in the surviving *Cǎo Liú* from the early 20th century AD Zìgòng accounts: but as *cǎo* [草] is also the term used to describe the rapid, cursive style of handwriting, the distinction they make between *cǎomǎ* and *hàntǐ* forms may represent no more than that between 'rough' and 'fair-copy' handwriting of the simpler characters (which is not visible in Aiken and Lu's example as all the entries there are printed). Gardella (1992: 326) also identifies three different types of numerals: 'ordinary', 'shorthand' (to facilitate calculation) and 'great' (used to avoid fraud) but again does not give illustrative examples. Yuan (2010) has identified special shorthand '*Sūzhōu mǎzì*' [苏州码字] characters being used in the 18th and 19th century Tǒng Tài Shēng merchant account books he has examined, which are probably easier to write with a writing-brush (*máobǐ* [毛笔]) using vertical strokes instead of the normal horizontal strokes used for standard numeral characters. They may also be easier to relate to the positions on the abacus. Other accountants also used variants of normal numerals (which can be hard to decipher to the untutored eye), e.g. to prevent fraudulent alteration a 'curved tail' can be added to the horizontal character for *yī* [一], i.e. 1; or *líng* [〇], i.e. zero, can be written more like a triangle. Chinese character systems lack the 'place value' of Arabic numerals (although these are nowadays generally adopted in writing 'practical' Chinese too), so that they are equivalent in English to writing out the words for the numbers (e.g. 'five thousand three hundred and twenty seven' not '5327'), which may also reflect a longstanding tradition of 'reading aloud' of the accounts—see also Appendix I. However in writing the *Sūzhōu mǎzì* the Arabic layout is used, e.g. 'yi ling ling' for one hundred instead of 'yi bai'. Albeit without access to further original examples, Dr. Yuan suggests we tentatively identify the *Sūzhōu mǎzì* as a form of *cǎomǎ* and the *kuàijì tǐ* with Gardella's 'great' forms. Further research is needed on possible influences from overseas trading.

[84] And possibly yet again into an additional *Lóngmén Bu* for trial-balancing (Lin, 1992: 114). Necessarily, as the example given in Aiken and Lu (1998: 232) is printed rather than a facsimile, it cannot show that the handwriting in the *Cǎo Liú*, being written as transactions occurred, would presumably have been very rough while the *Xì Liú* and *Zǒng Qīng* would presumably be in a fair copy hand (Auyeung and Ivory, 2003: 9). The example necessarily also illustrates the processing of only a few entries, so it is not clear from this what the physical form of the account 'books' of actual enterprises handling many transactions of different kinds over many periods would have been nor whether/when any printing was used (e.g. for account headings). Contrast the detail with which researchers have been able to reconstruct both complex ancient accounting systems (e.g. Rathbone, 1994) and early Italian DEB systems (e.g. Yamey, 1994) from surviving original records. Dr. Yuan's current (2010) investigations should shed more light in due course.

13. A final development,[85] around the middle of the eighteenth century, was the 'Four Feet (or Leg) Bookkeeping System' (also known as the 'Heaven and Earth Matching' account system *Tiān Dì Hé Zhàng* [天地合账]), which was apparently widely used in the far south-western Yúnnán [云南] Province.[86] The examples given by Aiken and Lu (1998: 234-236) illustrate its principles. It utilized the same threefold sequence of account 'books' for processing, while in practice for cash transactions it could either use what is claimed to be full CDEB ('Four Feet'), or alternatively could still use the older 'Three Feet' system.[87] Distinguishing the precise 'stages' and extent of developments is therefore not straightforward (cf. Lin, 1992: 118, fn.3).

14. The main innovation of the *Tiān Dì Hé Zhàng* system appears to have been that the period's profit (or loss) was calculated in a statement called *Cai Xian Jie Ce*, showing the various 'Receipt' accounts (*Jìn*) together with any balancing loss in the top part, and the various 'Payment' accounts (*Jiǎo*) together with any balancing profit in the bottom part. A kind of 'balance sheet' report called *Cun Chu Jie Ce*[88] was also prepared with the Owing accounts (*Gāi*) together with any balancing profit in the top part (called *Tiān Fāng* = Heaven) and the Keeping accounts (*Cún*) together with any balancing loss in the bottom part (called *Dì Fāng* = Earth). The process of balancing the two parts was called *Tiān Dì Hé* ('Matching the Heaven with the Earth'), terminology which may again reflect

[85] However Lin (2003: 86-7), who now places Fu Shang's invention of the *Lóngmén* system in the late fifteenth century (i.e. approximately contemporary with Pacioli) rather than in the seventeenth century as others do (and as he did in Lin, 1992: 111) now sees *Tiān Dì Hé Zhàng* as a refined version belonging to the beginning of the early seventeenth century, with a further evolution of the system taking place in the nineteenth century into what he calls *Shōu-Fù* bookkeeping, which required 'dual-recording of each transaction in two accounts simultaneously' and continued 'in certain sectors of the economy (e.g. banks, government institutions and small businesses) through to the early 1990s'. As he does not cite any original records or even earlier researchers, and as this description is hard to distinguish from that of the pre-existing 'Four Feet' system, his divergences on chronology from previous the English-language literature (on which he does not comment) are hard to interpret and evaluate. He is now followed by Song 2011.

[86] Although nowadays one of the poorer provinces (but famous for supplying its varieties of edible wild mushrooms, as well as Pu'er tea and now coffee), the main natural resource in Yúnnán is mineral deposits for mining. Authors who wish to stress the indigenous development of CDEB see it as remote and isolated, but like other 'remote' Chinese regions it may have been open to outside and even to foreign influences. 'Because of its geographic location [bordering Burma, Laos and Vietnam] the province has comparative advantages in regional and border trade with countries in southeast Asia'. http://en.wikipedia.org/wiki/Yunnan (*accessed 02.09.11*). The ancient 'Southern Silk Route' to India (which was to be reopened as the 'Burma Road' in the 20th century) passed through it: so it would surely have had merchants passing through and trading.

[87] However, Auyeung and Ivory (2003: 11) describe the system as using double-entry throughout.

[88] The etymology is not clear to us but *Chū* could here refer to 'source' accounts.

Fēng Shuǐ principles relating to the harmony of *Yīn* and *Yáng* (e.g. Gao and Handley-Schlacher, 2003: 54; Solas and Ayhan, 2007: 160).[89]

15. After the Opium War of 1840 the Western DEB system was gradually introduced through the European concessions that were using it (Aiken and Lu, 1998: 221**)**. Even after the Communist takeover in 1949 DEB continued to be used for many years—until the Sino-Soviet split in the early 1960s (Lin, 2003: 92)—as it was merely adapted to the Soviet bookkeeping system, which itself continued to use DEB, albeit now for accounting under state production planning rather than for capitalist 'profit' accounting. (This later period is discussed further in Anon***, 2012).
16. All the above stages relate primarily to bookkeeping developments possibly complemented by some 'financial reporting' of financial results and financial position, primarily for owner-managers, family or clan members, or absentee investor-partners. As for 'management accounting', Ji (2003) explores concepts of cost and profit that appear in scattered places within Chinese agricultural treatises (*Nóngshū* [农书]) from the first century BC to the 17th century AD. These include examples of calculations of projected profits from various activities, normally based on direct incremental out-of-pocket costs compared with sales revenues for some quantities of outputs. Ji identifies (p.76-7) the appearance of an 'opportunity cost' based calculation, and (p.78) the implied estimate of a

[89] It is not clear from the illustrative example in Aiken and Lu, 1998: 234-6 at what point the 'profit' or 'loss' became part of the 'ledger' account balances themselves, i.e. how 'brought forward' balances were dealt with and how the 'ledger' (the *Zǒng Qīng*) was 'closed' and 'reopened' in a real-world multiperiod setting. However, Lin (1992: 117) gives an English version of Guo's schematic representation of the system, showing the *Cai Xian Jie Ce* and *Cun Chu Jie Ce* reports as the end products of the system but this is not referred to in Guo *et al*. (2011). Within the ledger (*Zǒng Qīng bu)* there are subdivisions including 'Receivables' and 'Payables' ledgers, and also 'Purchases' and 'Sales' ledgers (the pīnyīn is presumably *Jìnhuò Zǒng* ('goods-in ledger') and *Xiāohuò Zǒng* ('goods-sold ledger'). As we have previously discussed, the use of *huò* suggests to us that these are likely to be inventory accounts; in which case it is not clear where in the *Zǒng Qīng bu* the 'nominal' accounts for purchases/sales/profit/loss appear (cf. Stoner, 2010: alternatively, if they are nominal accounts, where are the 'real' inventory accounts?). Lin (1992: 118) says the final balancing revealed the earnings of the period, as '*Cún* (stocks) = *Gāi* (claims) + Earning (profit or loss)'. As we have already noted in respect of earlier systems, here *Gāi* must mean only 'liabilities'—albeit presumably plus any *previous* equity—if the difference is to equal an increase in equity representing profit (cf. Guo *et al*., 2011).. Lin does appear to interpret the procedure this way as he says that thereby 'merchants and bankers recognized that the earning accounts were only temporary and that they must be closed and transferred into the Summary of Stocks and Claims (real accounts) to reflect the net changes of stocks (assets) of the period'. However no evidence is given for how this closing of the current period's books, and re-opening for the subsequent period, was effected. Huang and Ma (2001: 9) say similarly (referring to a 1997 paper by Huang and Chang but without citing any original evidence) that in the *Cun Chu Jie Ce* 'capital and liabilities were recorded in the top half of the statement and assets were recorded in the bottom half. A profit (given by the income statement) would be recorded in the top half of this balance sheet and a loss in the bottom half' so that then the two halves could be matched.

return on investment. However these calculations do not appear as sophisticated as even the (notoriously careless) calculations by the Roman agronomist Columella in the first century AD, who compared the prospective annual return from investing in viticulture to lending the money out at 6% (simple) interest per annum (Macve, 1985).[90] Despite the advances that had been made in CDEB, Ji considers that accounting progress in China stagnated after the seventeenth century due to the self-sufficiency of most family units in the feudal economy, the absence of textbooks in accounting to replace oral tradition and apprenticeship, the lack of significant opportunities to develop capitalist enterprise within the rigid class structure of bureaucratic feudalism, and the restrictive policy of the Míng and Qīng emperors with regard to overseas trade which cut Chinese accounting off from Western developments. While economic historians now recognise considerable activity in bringing agricultural surpluses and by-products (such as cloth) to market and that in the 18th century Chinese prosperity still matched or exceeded that in Europe (e.g. Richardson, 1999), these factors may well have played an important role with regard to the potential for industrialisation (which we consider further in Anon***, 2012).

[90] It is not clear to us why the conclusion from the calculation described at Ji, 2003: 76-7 indicates that hiring a long-term labourer is loss-making, given that the revenue from his working of the mulberry trees (for silk production) has not been included.

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