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Memory, transaction records, and *The Wealth of Nations*

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ABSTRACT

Adam Smith hypothesized that impersonal exchange was necessary for a society to develop specialized division of labor and create wealth. Douglass North and Vernon Smith argue that successful developed economies are the result of institutions. We hypothesize and provide evidence from ethnographic data that the basic accounting technology of recording transactions is associated with more extensive impersonal exchange and increased specialization in the division of labor. Our intuition is that extensive impersonal exchange requires reliable memory of trading partners' past behavior to sustain trust and encourage reciprocity when a group expands beyond the size of traditional hunter-gatherer groups. Our findings are consistent with the hypothesis that transaction records are necessary for the emergence of complex economies as suggested by the archaeological evidence of recordkeeping in Mesopotamian societies 10,000 years ago.

Introduction

> The palest ink is better than the best memory.
> **Chinese Proverb**

> (K)nowledge of the past, the record of truths revealed by experience, is eminently practical, as an instrument of action and a power that goes to making the future.
> **Lord Acton**[1]

> The past had not merely been altered, it had actually been destroyed. For how could one establish even the most obvious fact when there existed no record outside your own memory?
> **George Orwell**[2]

Human economies vary considerably in scale, complexity, and performance; some generate great wealth while others remain mired in poverty. In *The Wealth of Nations*, Smith (1776/1976, Book I, Chapter II, p. 17) argued that the growth of economies derived from extensive impersonal exchange, which grew out of a human "propensity to truck, barter, and exchange one thing for another." Humans sustain cooperation better than other primate species in part because we can remember and communicate information about the cooperative acts of others, which is a prerequisite for reciprocity and reputation formation (Axelrod & Hamilton, 1981; Nowak & Sigmund, 2005). Nevertheless, the evolved proclivities and abilities of the brain that favor exchange and cooperation can account for human groups only up to a size of about 200 persons (Dunbar, 1992). What role did the institution of recordkeeping play in allowing some economies to circumvent the biological constraints of memory and thereby expand impersonal exchange and produce great wealth?

The institutions that societies use to govern economic and social interaction have been suggested as necessary

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1 Inaugural lecture on the study of history, Cambridge University, June 1895, as cited in Collini, Winch, and Burrow (1983).

2 Orwell (1949/1961, p. 36).

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for economic development (North, 2005; Smith, 2008).[3] These institutions include legal codes that support property rights and money that relaxes constraints inherent to barter exchange, both of which date back thousands of years (Saggs, 1989, pp. 156–175; Redish, 2003). Recordkeeping for exchange transactions is an even older institution found in the first human settlements of Mesopotamia circa 8000 BCE (Schmandt-Besserat, 1992). Humans first invented writing to keep records (Nissen, Damerow, & Englund, 1993), which coincided in time (circa 3000 BCE) with the emergence of the first cities, underscoring the central importance of transaction records that objectively document the history of exchange. Accounting scholars have long recognized the presence of recordkeeping in ancient societies (Carmona & Ezzamel, 2007, provide an overview; see also Macve, 2002).[4] Despite this evidence, we have no parsimonious scientific explanation and little broad evidence for the emergence of transaction records and their role in economic and social development.

Basu and Waymire (2006) hypothesize that transaction records emerge to symbolically represent the history of exchange in a more permanent manner external to the human brain. External records lessen the chances of individual memory failure and are valuable in tracking a trading partner's past behavior as a basis for current decisions. Records can also establish reliable social memory and common knowledge useful to two or more parties in structuring an exchange. For example, "hard" records that are verified by witnesses can make it "difficult for people to disagree" later about whether past promises have been fulfilled (Ijiri, 1975, p. 36). As recordkeeping evolves to encode more information, it enables drafting and enforcing contracts that govern complex exchange transactions across time and geographical boundaries – e.g., reliable records are needed to secure the property rights that facilitate modern capitalism (De Soto, 2000).

Basu and Waymire's hypothesis parallels the hypothesis that double-entry bookkeeping enabled modern capitalist organization, which was advanced by Sombart (1919), Weber (1927), Joseph Schumpeter (1942), and Ludwig von Mises (1949).[5] Both hypotheses assert a foundational role for basic accounting institutions in enabling the emergence of more complex forms of economic and social interaction. The main distinguishing feature of Basu and Waymire's hypothesis is that basic accounting institutions like recordkeeping play this role early in the development of complex societies rather than in emergent business organizations within already developed societies.

Basu and Waymire (2006) predict that (1) recordkeeping emerges because increasing exchange complexity taxes the brain's memory resources, and (2) accounting records work in tandem with other fundamental institutions to promote economic development. These predictions can be investigated in several complementary ways. One is to conduct experiments using neuroscientific methods to investigate whether the human brain's evaluation of exchange parallels culturally evolved accounting practices (Dickhaut, Basu, McCabe, & Waymire, 2009a, 2009b). A second avenue is to investigate whether the causal links inherent in the Basu and Waymire (2006) story are observed in a controlled experimental setting (Basu, Dickhaut, Hecht, Towry, & Waymire, 2009). Another possibility, which we explore in this paper, is to use naturally occurring data to test whether institutional and economic development is greater in those societies that have developed technologies for recording transactions.

We present evidence on whether the association between recordkeeping technology and societal size and complexity in ancient Mesopotamia generalizes to other human societies, and how strongly the prevalence of recordkeeping is associated with the presence of other fundamental economic institutions. We explore these issues using field data collected by ethnographers and archaeologists from a broad cross-section of human societies, and subsequently coded into machine-readable data by Murdock and White (1969). Murdock and White's Standard Cross-Cultural Sample (SCCS) provides extensive coded data for a variety of cultural variables – presently over 2000 – for 186 societies selected to maximize the cross-society independence of observations. SCCS societies are "pinpointed" to specific dates that vary across societies. The SCCS data include a variable that measures a society's recordkeeping technology as well as numerous measures of economic, social, and institutional development.

We use the SCCS data to empirically evaluate whether recordkeeping is a necessary institution for unleashing the economic forces of impersonal exchange and division of labor hypothesized by Smith to be the ultimate source of economic wealth. We document that recordkeeping use and sophistication is greater in societies that have surpassed the modest levels suggested by Dunbar (1992), and also that recordkeeping is present as early as or earlier in economic development than other basic institutions such as money, property rights, hierarchical organizations, a judiciary, and the use of credit. This evidence suggests that recordkeeping is a precursor to rather than the result of economic complexity. Our analyses also demonstrate that the extent of impersonal exchange is positively associated with the use of recordkeeping, and that specialized division of labor and the level of capital accumulation are more extensive in societies with greater opportunities for market exchange. Collectively, our findings are consistent with the hypothesis that basic accounting institutions are necessary but not sufficient to foster the extensive impersonal exchange and complex

[3] We use "institution" in the broad sense of Douglass North (1991, p. 97): "Institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct) and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. They evolve incrementally, connecting the past with the present and the future; history in consequence is largely a story of institutional evolution in which the historical performance of economies can only be understood as part of a sequential story."

[4] Earlier examples include Littleton (1927), Robert (1952), Keister (1963), Keister (1964), Mattessich (1987) and Baxter (1989).

[5] This hypothesis and its empirical basis are discussed and debated by Yamey (1949), Yamey (1964, Yamey (2005), Most (1972), Most (1973), and Carruthers and Espeland (1991).