

Money, Prices and Market in the Ancient Near East

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*“Feasts are made for laughter; wine gladdens life, and silver meets every need.”
Ecclesiastes 10: 19*

Abstract

This paper is about the role of money in the Ancient Near Eastern economy. Several aspects are treated. 1. The nature of the market. An overview of the discussion on the existence of a market economy. 2. The nature of the money; the money stuff (mainly silver); trust. 3. The measure of monetization; volatility of prices as a measure of market performance.

A case study is made on the Hellenistic Period (from Alexander the Great, c. 330 BC, to the first century BC), because from this period a huge number of data on prices and coinage is available.

A market economy in the Ancient World?

A capitalistic market economy in which the means of production are in the hands of private citizens or companies and in which the economy is driven by the innate drive of humans to act as a *homo oeconomicus* to strive for maximization of profit and in which prices of goods are set by the law of supply and demand, is taken for granted in the modern western world and it is often believed that this is the only natural way in which a society can function. The basis of this concept can be found in the seminal work of **Adam Smith** (1723-1790), *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776). He promoted the idea of a free market in which individuals pursue their own interest, which in turn “by an invisible hand” leads to the best interest of society as a whole. Prices of goods are fair: though the individual producer wants to ask the highest possible price, he is bound to accept lower prices thanks to the free competition of competitors. Smith is the basis of liberal and neo-liberal economic thinking and the ideas are still prevalent in especially American economic policy and the idea of the free market is the basis of economic thinking of the European Union. The state must have a limited role in the economy and the market must be the guiding principle.

One might ask whether this really has been the case in all times and places in history and whether an economy without market ever has been a reality, and if there was a market, whether it functioned as formulated above. Now it must be said beforehand that a totally free market never existed and still does not exist today. In every society the market operates within the framework of state intervention and social customs. Products can change hands thanks to the fact that the state builds roads and harbors, provides for a legal system so that contracts can be trusted and swindlers punished. States disrupt the market and the economy by building cities, raising taxes and going to war. This insight has been furthered by the work of the American economist **Douglass North** (*1920), whose most influential work is

Institutions, Institutional Change and Economic Performance (Cambridge University Press 1990). In this book he stressed the importance of institutions (“humanly devised constraints that structure political, economic and social interactions” and transaction costs, the costs of making lawful contracts possible, the costs of transport, maintenance of roads, but also social or religious conventions about e.g. limitations in asking interest.

Earlier philosophers, historians and anthropologists already opened our eyes for types of societies that are not directed by the forces of capitalism. **Karl Marx** (1818-1883) saw the capitalist mode of production as the latest phase in a development from a slaveholding society (‘Sklavenhaltergesellschaft’) in Antiquity, through a feudal society in the Middle Ages, towards a capitalistic society in the modern world. In Antiquity (and he thought in this of the classical Greek and Roman world) the means of production (land, labor, capital) were in the hands of private citizens, while the work was done (mainly) by slaves. In the Middle Ages the means of production were in the hands of a feudal nobility, and the work was done by serfs. In the capitalistic world the means of production (now mainly factories and machines) are in the hands of ‘capitalists’ who own the factories, while the labor is done by the ‘proletariat’ of the poor and exploited labor force. This was a necessary historical process, which would end, still in the future - after a revolution - , in a classless society, a kind of heaven on earth. This historical process took place and would be fulfilled, in Marx’ eyes, in the Western world. It did not take place in the East, where he observed a different system: the Asiatic Mode of Production (AMP). He hinted on it in his *Das Kapital* and worked it out in an article on India. The Asiatic mode of production was characterized by an autocratic state (so endorsing the older concept of ‘oriental despotism’) in which the king or emperor possessed all the land, while the people lived in villages (‘Dorfgemeinden’), lived off their own land and had to pay taxes in kind to the palace, which in turn redistributed it among the elite of favorites (civil servants, soldiers, temples). There was no market and no real trade. What the villagers did not produce themselves they acquired by reciprocity and barter in the village. Marx saw this system as stagnant, so that it was impossible to have a development in Asia comparable to Europe. So it was after all not so bad that India was conquered by the British: it brought it into the western world, so that the proletarian revolution could take place there as well. Marx was not always very outspoken in his idea concerning the AMP, but the idea was taken up by Friedrich Engels and by Lenin. It was rejected by Stalin, who decreed that the ‘slave mode of production’ was also valid in the Ancient (Near) East.

The idea was also taken up and adapted by several scholars in the West. We first mention the German historian **Karl Wittfogel** (1896 – 1988). Wittfogel developed from a communist (he became member of the KPD in 1920) before the Second World War into a fierce anti-communist after the war. In 1934 he left Germany (after having been imprisoned) for England and the United States. His main publication was *Oriental Despotism: A Comparative Study of Total Power* (1957), in which he defended the idea of the Asiatic mode of production while at the same time rejecting Marxism. He surmised that Stalin had rejected the AMP, because it looked so much alike his own despotic Russian (Asiatic) state. Wittfogel coined the concept ‘hydraulic empire’. He argued that despotic oriental states emerged in the riverine deltas of Mesopotamia and Egypt, where agriculture could only be successful with the help of irrigation works, which could only be construed in cooperation and organization by an autocrat with a well-organized state mechanism that could impose forced labor. So the oriental despotic state was determined by geographical determinants.

Another scholar who took up the idea was **Karl Polanyi**, though in a loose way. Karl Polanyi (1886-1964) was born in Hungary (Austria-Hungary). He developed socialist or

‘communist’ sympathies as an editor of the Austrian economical periodical *Der Österreichische Volkswirt*, and was for that reason nowhere welcome. In 1933 he left Austria for England and moved to the United States in 1940. He got a teaching position from 1947-1953 at Columbia University in New York, but due to the fierce anti-communist atmosphere in the USA in the 1950s (Joseph McCarthy) he could not get an entrance visa and had to live in Canada. At Columbia he worked closely together with one of the most prominent Assyriologists of the 20th century, Leo Oppenheim (Vienna 1904 – Chicago 1974). His first major work was *The Great Transformation* (1944), in which he argued that the modern nation state was inextricably connected with the modern market economy (‘a market society’) and that such a society was not a self-evident phenomenon of all times and would in the end disappear. In Polanyi’s views economy was not a phenomenon that could be studied as distracted from the fabric of society; rather the economy was ‘embedded’ within society and its values. Polanyi argued that ‘economics’ has two meanings and the fact that scholars are not aware of this creates a lot of misunderstandings. He criticized the ‘formalist’ approach of the modern economists who defined economy as a study of rational decisions of individuals to deal with the scarcity of goods, how they strive for maximization of profit. This may be applicable in a capitalist society (existing since c. 1850), but was misleading in the study of older societies. In his own ‘substantivist’ approach he argued that the real substance of economy is how to make a living and deal with all kind of social forces in which market need not play a role. It is therefore not acceptable to use modern economic ‘formal’ concepts, like profit, inflation and market, in the study of early periods. Concepts like ‘reciprocity’ and ‘redistribution’ are to be preferred.

Another major work is a volume edited by him and two colleagues at Columbia: *Trade and Markets in Early Empires* (1957). In this work he presented his paper: ‘Marketless trading in Hammurabi’s time’. Hammurabi was a great conqueror king of Babylon in the 18th century BC (Old Babylonian Empire). The substance of his article actually was a corpus of a community of Assyrian merchants in the city of Kanesh (SE Turkey) in the 19th century BC. At Columbia University he developed his concept of a marketless economy in the Ancient Near East. It was a showcase for him to prove that marketless economy was possible and actually existed. As said, in his view market economy is typical of the modern nation state. In Antiquity, as especially in the Near East, trade was not organized through a free market, but through negotiations and treaties between states. Trade was in the hand of state directed commercial agents, rather than free traders. The book so initiated a discussion on the status of the trader (Sumerian DAM.GAR; Akkadian *tamkārum*). A connected issue in this discussion was the existence of a physical market, a place where goods were traded, as on the Greek *agora*, ‘marketplace’ (in Polanyi’s views the Greek economy was one step into the direction of a market economy). In Polanyi’s (and Oppenheim’s – who also had a contribution in the volume) view there was not such a place in Mesopotamia and there was no word for it. Assyriologists discussed subsequently if the words *kārum*, ‘quay’, and *sūqu*, ‘street, square’, in Arabic *suq*, denoted such a concept. And certainly there was not a word for the abstract concept of ‘market’.

The influence of Polanyi on the view of ancient historians on the ancient economy was overwhelming. He much influenced the Assyriologist Oppenheim, but also later Assyriologists like **Johannes Renger** (*1934), a specialist in Old Babylonian economic history in Berlin (Freie Universität). But his most profound influence was spread through the work of the classical ancient historian, **Sir Moses Finley** (1912 – 1986). Finley, born in New York as Moses Isaac Finkelstein, taught at Columbia University, City College of New York and Rutgers University (from 1947), but just like Polanyi he had to fear anti-communist measures. In 1951 he was denounced by Karl Wittfogel (!) before the House Un-American Activities Committee (HUAC) as a member of the forbidden American Communist party,

and since Finley refused to defend himself, he was dismissed from Rutgers University in December 1952. He then moved to Britain. From 1955 he worked as lecturer and later professor of Ancient history in Cambridge until 1979. Finley indeed professed to be influenced by Karl Marx, by members of the Frankfurter Schule (Max Horkheimer, Herbert Marcuse), but most of all he was influenced by the work of the sociologist and ancient historian Max Weber (1864-1920) and the ancient historian Johannes Hasebroek (1893-1957).

Moses Finley framed historical research in ancient economy profoundly for decades by his book *The Ancient Economy* (1973). In this book he took position in a debate that raged already since the end of the 19th century, namely whether the ancient economy can be compared with the modern economy and can be discussed with the modern economic vocabulary (a tenet defended by the 'modernists'), or had to be considered entirely different, because the ancients lacked the economic knowledge to act rationally as *homo oeconomicus* and lived mainly as subsistence farmers off their own land without much trade and pursuit of profit (a tenet defended by 'primitivists'). The discussion had already started with the German economic theorist **Karl Bücher** (1847-1930), who published in 1893 *Die Entstehung der Volkswirtschaft*. Based on criteria like division of labor and the distance between producer and consumer he distinguished three stages of economic development: (1) *die geschlossene Hauswirtschaft*; (2) *die Stadtwirtschaft* and (3) *die Volkswirtschaft*. This distinction paralleled the traditional division in historical eras: (1) Antiquity; (2) Middle Ages; (3) Modern Times. Antiquity was supposedly characterized by the *oikos*, the Greek household, which only produced for its own sustenance (strived for autarky), which made trade unimportant. **Johannes Hasebroek** (1893-1957) went further on this path. In his book *Staat und Handel im alten Griechenland* (1928) he argued that in Ancient Greece economic policy was impossible, because in the ancient Greek *polis* the citizens monopolized agriculture by forbidding metics (*metoikoi*, resident aliens) to own land and so left trade and industry to them. Economic concern did not go further than securing enough imports to feed the population. This line of thinking is of course 'primitivist'. Bücher's thesis was first attacked by **Eduard Meyer** (1855-1930) who maintained that Bücher's three types of society existed already in Antiquity: the *oikos* economy existed in archaic Greece, the *Stadtwirtschaft* was found in the classical Greek *polis* and the Hellenistic and the Roman empires experienced modern economic processes. Meyer liked it to make comparisons with his own time and can be considered a full-fledged 'modernist'. **Max Weber** (1864-1920) tried to bring the discussion to a higher level: he argued that concepts as developed by Bücher can better be seen as theoretical heuristic models ('Idealtypen') that do not exist fully in history, but can help us to understand historical reality. Moses Finley followed this idea and spoke loosely about 'models' (see his last book *Ancient History: Evidence and Models*, 1985).

The primitive position, however, was pushed to the background by the very influential and highly productive 'modernist' Russian scholar **Michael Rostovtzeff** (1870 – 1952). He chose the side of the anti-communists in the Russian revolution (1917) and had to flee. He ended up in the United States, where he could work in Wisconsin and Yale. He was a fierce anti-communist who believed firmly in the free market and trusted in the stimulating role of the bourgeois elite in the cities. Although a fierce anti-communist, he did use freely the vocabulary of Karl Marx: he frankly spoke about 'capitalism', 'bourgeois', 'proletariat.' From his impressive oeuvre two books stand out: *The Social and Economic History of the Roman Empire* (1927; rewritten and republished in 1956) and *The Social and Economic History of the Hellenistic world* (1941), in three volumes totaling 1779 pages.

The publication of *The Ancient Economy* (1973) changed all this. Finley's book marked a period in which the primitivist approach was dominant, the prevailing orthodoxy, especially at Cambridge. The idea of an embedded economy, in which order and status were

more important than economic rationality and in which proper economic knowledge was non-existent, won the day. The primary witness for Finley was Cicero, who declared his view on a decent way of acquiring fortune as follows (*De Officiis* I 150-1):

Now in regard to trades and employments (*de artificiis et quaestibus*), which are to be considered liberal¹ and which mean, this is the more or less accepted view. First, those employments (*ii quaestūs*) are condemned which occur ill-will, as those of collectors of harbour taxes and money lenders. Illiberal, too, and mean are the employments of all who work for wages (*quaestus mercennariorum*), whom we pay for their labour and not for their art; for in their case their very wages are the warrant of their slavery. We must also consider mean those who buy from merchants in order to re-sell immediately, for they would make no profit without much outright lying And all craftsmen are engaged in mean trades, for no workshop can have any quality appropriate to a free man. [...] Commerce (*mercatura*), if it is on a small scale, it is to be considered mean; but if it is large-scale and extensive, importing much from all over and distributing to many without much misrepresentation, is not to be greatly censured. Indeed, it even seems to deserve the highest respect if those who are engaged in it, satiated, or rather, I should say content with their profits (*quaestus*), make their way from the harbour to a landed estate, as they have often made it from the sea to a harbour. But from all things from which one may acquire, none is better than agriculture (*agri cultura*), none more fruitful, none sweeter, none more fitting for a free man.

But, as it so often happens, no theory is the last one. Early doubts as regards the model were expressed by **John d'Arms (1934-2002)**. He argued that a system of norms and values (status more important than profit) is not indicative of real behavior. Cicero may have expressed disdain for commercial activities, but nevertheless was a money lender and he exploited blocks of flats] (D'Armes 1981). **P.W. de Neeve (1945-1990)** demonstrated in his inaugural lecture at the VU University, *Peasants in peril* (1983), that the Roman handbooks on agriculture by Cato, Varro and Columella show that Roman farmers has a keen interest in the profitable location of their estates. Roman estate owners had plantations with goods for the market. Location theory of Von Thünen appeared to be applicable to ancient Rome. Cost-benefit analysis was better developed than previously thought, as **Dominic Rathbone** found out after his study of an archive of a Roman landowner in Egypt (Rathbone 1991).

So it had become clear in the first place that modern economy is not so 'modern' as Finley thought (modern man is also not in all respects a *homo oeconomicus*, he is also directed by social values and often strives for irrational goals) and the ancient economy did appear to be not so 'primitive': it appeared that ancient man was not averse of making profit and modern ideas about price setting and the use of checks payable to bearer did exist. A brief overview of modern discussions may be found in the introduction to *The Cambridge Economic History of the Greco Roman World* (2007) by the editors Walter Scheidel, Ian Morris and Richard Saller.

In the framework of this lecture it is good to note that Finley's understanding of the term 'Ancient' was restricted to the Greek and Roman world; the Near East and Egypt constituted totally different societies and in his description of it (Finley 1973: 27-9) you feel lurking behind the Asiatic Mode of Production (AMP).

What is the relevance of all this for the ancient Near East? We shall investigate whether the influence of Marx, Polanyi, and Finley is tangible in later research and see if their ideas have found support.

One of the first who systematically discussed Polanyi's ideas was **Klaas R. Veenhof** (*1935). He got his PhD in Leiden in 1972 on *Aspects of Old Assyrian Trade and its Terminology*, which dealt with the fascinating corpus of cuneiform documents from Kanesh (Kültepe) in South-East Turkey, a region called Cappadocia by Greeks and Romans, which revealed a community of Assyrian merchants trading with their mother city Assur in North

¹ 'Liberal' means: 'fitting for a free citizen'. *Artes liberales*, 'liberal arts', are studies fitting for a free citizen.

Iraq, 1600 km away. It was this text corpus that was at the basis of Polanyi's article on Marketless trading in Hammurabi's time. Veenhof was professor Assyriology at the VU University Amsterdam and in Leiden and is now emeritus professor. He is one of the leading experts in Old Assyrian trade (c. 1900 BC). Veenhof appeared to be very critical and argued that Polanyi misunderstood many texts. As a matter of fact, the Kanesh corpus is a show case of market awareness. Many letters testify to the endeavor of the traders to find good markets and get good prices for their goods. Modern instruments like checks were used indeed (see also Veenhof 1997).

More systematic studies of the concepts Asiatic Mode of Production and 'marketless economy' are made by **Carlo Zaccagnini** (1989) and **Pierre Briant** (*1940). Briant, professor in Toulouse and in Paris (Collège de France), the expert on Achaemenid history, adapted the concept of AMP into 'mode de production tributaire' ('tributäre Produktionsweise') to avoid the word Asian and make it a more general concept (Briant 1982). The Assyriologist **Johannes Renger** (*1934) for long counted as a defender of Polanyi's views on the Near Eastern economy, especially as regards Babylonia in the Old Babylonian period. One of the major researchers on Babylonia in the first millennium BC is **Michael Jursa** (*1966) and his research team in Vienna, among whom Kristin Kleber (VU University Amsterdam). He conducted a huge project on the economic history of Ancient Mesopotamia in the first millennium, especially in the 'long sixth century' (c. 605 – 480 BC, from the reign of the Babylonian king Nebuchadnezzar to the reign of the Persian king Xerxes, who quelled a Babylonian rebellion which led to the eradication of the ruling temple elite in 482 BC.² The relevant documents, written in cuneiform script on clay tablets that have the advantage of being fire-resistant and thus having survived massively, come from the period of the Neo-Babylonian empire (612 – 539 BC) and the Persian or Achaemenid empire (539 - 331). Ten thousands of documents from this region and period survived, administrative and legal documents that provide a unique insight into the Babylonian economy and allows quantitative, statistical and econometric research which is hardly possible anywhere else before the later Middle Ages (perhaps with the exception of Ptolemaic and Roman Egypt). It enables us to stretch out the long term history of market performance by c. 1500 years. The main result of this project is the massive volume (897 pp.) *Aspects of the Economic History of Babylonia in the First Millennium BC: Economic Geography, Economic Mentalities, Agriculture, the Use of Money and the Problem of Economic Growth*, written mainly by Michael Jursa, with contributions by J. Hackl, B. Jankovic, K. Kleber, E.E. Payne, C. Waerzeggers and M. Weszeli.³ In this, and in other publications, Jursa concluded that Polanyi's view cannot be upheld anymore. Prices of goods were not set by governments, but by the rules of supply and demand. Even the temples who were large landowners and whose economy was thought to be based on autarky and self-sufficiency appeared to be market oriented. Some temples specialized in the production of wool, others in dates. With the money so earned they could pay wages and import other goods from the market. Jursa suggests using the 'commercialization model' as advocated by Hatcher and Bailey (2001), in which markets and money based exchange are important factors (Jursa 2010: 16, 42-8; 783-800).

I have done my part in the discussion in a research project 'On the Efficiency⁴ of Markets in Pre-Industrial Societies: the case of Babylonia 485 – 60 BC', funded by the Netherlands Organization for Scientific Research. This project considers the next period in

² START Project "Economic History of Babylonia in the First Millennium BC", funded by the Austrian *Fonds zur Förderung der Wissenschaftlichen Forschung* (FWF).

³ Another major publication is Baker & Jursa, eds., 2014.

⁴ Actually the main concern of the project was 'market performance'. See for the distinction between the concepts 'market performance' and 'market efficiency' below.

time, the later Persian or Achaemenid empire (539 - 331), the empire of Alexander the Great and the Seleucid empire (331 - 141), and the Parthian or Arsacid empire (141 – 61 BC, i.e. until to end of the relevant cuneiform documentation). The most stunning part of the evidence of this period is the detailed recording of thousands of prices of food and wool. This evidence comes from a surprising source: the meticulous work of Babylonian scholars who in a quite modern way collected evidence and made databanks. The collection which interests us here are the so-called astronomical diaries. These astronomical diaries are a dataset for research in the field of divination, a type of scholarship for which Babylonia was well-known (praised as well as condemned) in antiquity. They contained a notation of celestial phenomena followed (in an increasing degree over time) by information on other (ominous) events that were supposed to be related to the position of the planets, like strokes of lightning, the direction of the wind, monstrous births, the level of the Euphrates, temple robbery, famines, human and crop diseases, but also deeds of kings (visits to Babylon and concomitant visits to temples, military campaigns), important events in Babylon and the level of the prices of six commodities, among which barley, dates (staple crops) and wool.

The basic purpose of Babylonian scholarship was to find out regularities in the relations between the position of the planets and other factors. In one field they were very successful: after centuries of scientific research the Babylonian astronomers were able to predict the constellation of the planets and the stars, and lunar and solar eclipses. Possibly less successful they were in another field: they hoped that, if there is regularity in celestial phenomena, they might one day also find regularities in other phenomena that seem irregular but may not be irregular, such as the death of kings, the level of the Euphrates and the volatility of prices. It would give them a real grip on the future. The study of omens and phenomena on earth and in the sky in a coordinate approach would help them as they believed that the signs in heaven concur with the signs on earth.⁵ The fact that these data were recorded at all thus means they were considered unpredictable and, hence, market prices. They therefore form an excellent source of data for the analysis of the working of markets.⁶

These astronomical diaries have become accessible to a wider readership by the publication of the tablets in three volumes in transcription and translation by the late Abraham Sachs and by Hermann Hunger (Hunger/Sachs 1988, 1989 and 1996). The prices have been collected in Slotsky 1997 and Vargyas 2001 (but cf. Van der Spek and Mandemakers 2003) and by the VU University Amsterdam research team.⁷

Recently a new corpus of texts has been published: documents containing just series of prices, hence without astronomical observations or other information (Slotsky and Wallenfels 2009). They seem to be the outcome of a real interest in prices as such. The compilers of these lists seem to have had a real scientific interest in the development of prices. One tablet (no. 7) for instance collects prices of dates of the months VIII (harvest month) of the Seleucid years⁸ 178 – 185 (134 – 127 BC), but others try to give a complete overview of all months (no. 8) of the years SEB 185 – 190. While the astronomical diaries give the exchange value of one shekel of silver, these texts often have two shekels as point of reference and twice it is even 1 mina of silver (60 shekels). Where we can compare the prices

⁵ The best study on Mesopotamian scholarship in this field is Rochberg 2004.

⁶ Van der Spek 2000: 295-6.

⁷ Prices published on the website of the International Institute for Social History at Amsterdam, where a huge collection of price data is published: <http://www.iisg.nl/hpw/babylon.php>

⁸ From 311 BC a real era is used: the Seleucid era (SE). According to the Babylonian calendar (SEB) it started Nisan = April 311 BC, but in the Macedonian Calendar (SEM) the new year, and hence the era, started with Dios (=October) 312 BC. Babylonian and Macedonian calendar are both lunar and the Macedonians took over the Babylonian intercalation system.

with the astronomical diaries, it is striking that the prices of these price lists confirm the prices of the diaries; sometimes exactly, sometimes one document has average prices of a month where the diary has more detailed information (beginning, middle and end of the month). As in the diaries, the price lists convey more and more detailed prices per smaller parts of the month (days or cluster of days). The pricelists have enhanced our knowledge of the prices considerably. The main results are to be found in Van der Spek 2014 and Van der Spek, Van Leeuwen & Van Zanden (eds.) 2015 [2014].

To summarize the result of this project. The high volatility of the prices is an indication of the fact that prices were set by the law of supply and demand. This conclusion was drawn in earlier studies (Van der Spek 2000; Van der Spek & Mandemakers 2003) and formally tested by Peter Temin (2002). The volatility also indicates, however, that market integration did not function well. In a well-integrated market spikes in price levels are mitigated thanks to trade. In times of scarcity (high prices) prices will be lowered thanks to imports and in times of abundant crops (low prices) will rise due to exports. The effects of the integration of markets have been studied in depth by Karl Gunnar Persson in his study on *Grain Markets in Europe 1500 – 1900. Integration and Deregulation* (1999). We used this book as a guide for our own studies in Babylonia. More on this in the final section.

One of the features of the whole debate on markets was that it was based on a rather narrow interpretation of a market economy; illustrative is Polanyi's (1944: 68) definition of the 'market economy' as "an economic system controlled, regulated, and directed by markets alone; order in the production and distribution of goods is entrusted to this self-regulating mechanism". Such a 'pure' system, however, has never existed in historical reality; the view that markets are always embedded in and regulated by social and political institutions has gained strength as a result of the rise of New Institutional Economics (North 1990). This led to a much broader definition of markets which can be applied in all periods of time and all regions and had been used in other disciplines, most notably economics and economic history of the medieval and modern world. This broader interpretation is defined by Gravelle & Rees (1992: 3) in their book *Microeconomics* as: "a market exists whenever two or more individuals are prepared to enter into an exchange transaction, regardless of time or place". As such this fits in with definitions that were en vogue in other disciplines (Van der Spek *et al.* 2015 [2014]: 2-3). One might conclude that markets existed in the Ancient Near East and that the ancient world was not as primitive as the primitivists thought, while the modern world is not as modern as many people take for granted. In the modern economy the pure *homo oeconomicus* does not exist, man's economic behavior is embedded in social values, customs, and tradition not much more than ancient man. So it is of the utmost importance to study each society for its own merits. Social restraints are different in all societies. This may be illustrated by the study of factor markets. The *Journal for the Economic and Social History of the Orient (JESHO)* dedicated a whole issue (57/2, 2014) on 'Emerging and declining markets for land, labor and capital in the very long run: Iraq from c. 700 BC to c. 1100 AD', edited by Bas van Bavel (Utrecht University).⁹ Jursa and Van der Spek argued for ancient Babylonia in the first millennium BC and the early centuries of the common era that factor markets were much more restraint than commodity markets. Age old values concerning the inalienability of patrimonial land hindered the sale of land; interest rates were often set by tradition (20%) rather than by market forces; capital markets were not very much developed.

⁹ Cf. Van Bavel 2014; Jursa 2014; Van der Spek 2014; Rezakhani & Moroni 2014; Van Bavel, Campopiano & Dijkman 2014.

Silver and Money.

The fascination with money and especially with silver as the main money-stuff emerged during the time that our VU University research team were studying the prices of so many periods and regions. Nearly all these prices were recorded in silver, from Ancient Mesopotamia and China to modern Europe. That raised several questions. First: why does humankind put so much trust in a commodity (it is after all a commodity) that may shine fine, but that cannot feed, clothe or house anyone. The answer will be the fact that it is considered beautiful, shining, rare, small and durable. It can be fractioned, it can be used for luxury goods, an important feature in a society in which gift exchange is important (apart from exchange through trade). It should be noted that the first coins (fine objects with some distinguishing mark) had that function. But the fact remains that people put their trust in a nice and shining but useless material. It remains fascinating that people accept silver for grain. Even in the modern economy silver and gold are important, even after the abolition of gold and silver standards. Until 1967 guilder coins in the Netherlands were struck in silver and even recently, December 2014, the Dutch newspaper readers learned that in a secret operation the Dutch National Bank shipped 130 tons of gold from the United States to Amsterdam. The Netherlands keep a reserve of 612 tons of gold, of which only 11% is in the Netherlands and 61 % in the US. The reserve in Holland has now grown to 31%. A similar measure was taken recently by Germany. The Islamic State is now issuing their own coinage: coins in gold, silver and bronze. So until now trust in gold and silver still is an important facet of trust in currency. On the other end of the spectrum we see the introduction of the bitcoin.

Trust in silver is not evident and trust in silver is not unshakable. Silver may be debased and be of low quality, may become abundant on occasion and scarce on another, and may easily be stolen. There are well-known periods in history that the trust in silver decreased, as in the later Roman Empire, when people began to prefer gold. Yet, silver is most of the time the basic means of exchange and when a society goes over to gold as the standard, this is usually a sign of weakness of economic performance. This brought us to the second question: what is actually the role of silver in the economy? What does it mean, when suddenly an increase of silver in circulation takes place? What does it mean when trust in silver diminishes? What is the relation between silver and credit, between other forms of money, like bronze or even paper?

It is these questions I like to discuss as regards ancient Mesopotamia and the Levant. What can we learn about 'trust' in silver? How did people talk about silver? Secondly, what did it mean when silver was abundant or scarce? How did this influence the economy? A good example from the Greek world is classical Athens. A great part of the prosperity of Athens can be explained by the availability of silver, first thanks to the finding of silver in Laurium in Attica in the 480s BC, second by the collection of tribute in silver. The silver of Laurium enabled the Athenians to build ships, with which they could withstand the Persians in 480 BC at Salamis, which provided work and a living for hundreds of carpenters, shipwrights, rope-makers, etc.; it helped the Athenians to create an empire which caused the influx of more silver thanks to the contributions of the allies in the Delian League (established 477 BC). The expansion of the Roman empire much benefitted from the influx of silver coming from the East, when the Hellenistic empires had to succumb to the Romans and when a lot of silver, some of it ultimately originating from the treasury of the Persian empire captured by Alexander the Great (cf. Van der Spek 2011), flowed into the Roman Treasury and in the pockets of rich land-owners and politicians. It is one of the explanations of the economic boom in the first two centuries of our era. 'Primitivist' scholars are right in so far that the issuing of new coins and thus bringing silver into circulation, was not driven by

economic motivation. Their main purpose was paying soldiers and workers on public works. Silver is also a convenient means for the collection of tribute and taxes. Nevertheless, the impact on the economy was great.

The narrow connection between silver and money is old and can be observed until today. In modern French ‘money’ and ‘silver’ are the same word, *argent*, in modern Hebrew it is *keseḥ*. The same is true for the Hebrew Bible. The word *keseḥ* (or: *keseḥ*) is translated as both ‘silver’ and ‘money’. This word is directly related to Babylonian *kaspu*, also meaning both ‘silver’ and ‘money’. This can be observed in many expressions, such as *ana kaspi nadānu*, ‘to give for silver; to sell’ and *ana kaspi mahāru*, ‘to receive for silver; to buy’. I do not know what the etymology of the word is. In Sumerian logograms it is written as KÙ.BABBAR. The sign KÙ (or: KU₃) is already used in the late fourth millennium BC in documents from Uruk. The meaning of the word is both ‘shining’ and as substantive ‘shining metal’. BABBAR means ‘white’. ‘Gold’ is rendered as KÙ.GI = ‘yellow shining metal’ (Krispijn, forthcoming).

In Ancient Greek there are several words for money, such as *chrēmata*, ‘things that are needed (from *chraomai*, ‘to need, to be in want of, to use’); assets, things, money’. The word *ho árgyros* (from *argos*, ‘shining’) can mean both silver and money. Greek *to argýrion* means 1) coin; 2) money. *Argyrion katharon* = ‘hard cash’, lit. ‘pure silver’ (Theocritus, *Idyll* 15: 36). Then there is the word *nomisma*, referring to coinage. It means: ‘anything sanctioned by current of established usage, custom’. The word is explained by Aristotle as follows: “...but money has become by convention a sort of representative of demand; and this is why it has the name ‘money’ (*nomisma*), because it exists not by nature but by law (*nomos*) and it is in our power to change it and make it useless” (Aristotle, *Nicomachean Ethics* 1133b 1).

Latin has two words for money: *pecunia*, derived from *pecus* (genitive *pecoris*, ‘cattle’, so it is originally property in cattle, apparently an important indicator of wealth in early Rome). But the Romans also used *argentum*, ‘silver’ as a term for money. English ‘money’ and ‘mint’ are both derived from *Moneta*, the epithet of the Roman Goddess Juno *Moneta* in whose temple the mint was established (*monēta*). Italian and Spanish words for money are derived from Roman coins (Sp. *dinero*, it. *denero* or *soldi*) from Latin *denarius* (derived from plural tantum *deni*, ‘together 10’) and *solidus*, a ‘solid’ golden coin introduced by Constantine the Great in AD 312. The denarius, which became the main silver coin of Rome for over four centuries, was introduced in 211 BC and produced in enormous quantity from the silver captured in the sack of Syracuse the year before. The coin represented 10 asses, hence the word *denarius* (from *deni*, ‘tenfold’), but after 141 BC it represented 16 asses.

The question has often been raised if money really existed in the ancient Near East. Did silver indeed function as money, i.e., as means of exchange, means of account and means of storage wealth, as it is most often defined. Or was silver not more than a commodity like grain, lapis lazuli, wood, textiles, or slaves or whatever? We shall not go into this discussion.¹⁰ Though it is true that silver was a commodity, as it now is, and was in the time that in Europe coins were made of silver, I assume that silver functioned as money. The introduction of coinage changed the function of silver as money, but not fundamentally. The intrinsic value of coins and the weight remained important, though the aspect of trust acquired a new dimension thanks to the imprint on the coins which gave some extra support, but hampered international acceptance. A second question is how far the economy was monetized. Was money used only for big transactions or was it used in daily life for all kinds of transaction? It is clear that silver (and gold and bronze) did not get the function of money

¹⁰ Consult for the view that money is basically a commodity, and thus subject to the law of supply and demand: Flynn 2009 and Flynn & Giraldez 1997.

overnight. Next to exchange with the help of silver, barter persisted; inventories of property were only partially made up in silver; salaries were paid in kind as well as in silver. We may conclude that the history of Mesopotamia and the Near east in general was a gradual monetization (with ups and downs) until we may say that Babylonian society at least was 'deeply monetized' from about the sixth century BC (cf. Powell 1996; Jursa 2010: 469-753 and 788). Following Jan Lucassen, deep monetization is defined as "a substantial (per capita equal to between five and ten times the prevailing hourly wage) stock of currencies in circulation, consisting of denominations equalling the value of one hour or less of waged work". This stock is primarily conceived as a function of the demand for small-denomination currencies needed for the spending of earnings of the common man (Lucassen, 2014A, 2014B, forthcoming). The issue was discussed at a conference held at VU University Amsterdam on December 12 and 13, 2014, 'Coins, currencies and crises. On money and trust from c. 2000 BC – c. AD 2000' (Van der Spek & Van Leeuwen forthcoming)¹¹. It was concluded that the economy from the Neo-Babylonian empire on was deeply monetized indeed. In the next section we shall delve into the perception of silver and money in the Ancient Near East.

Silver and money in the Bible.

The Hebrew Bible is the lengthiest literary source from the Ancient Near East and it provides valuable insight into the way people looked at the value and trustworthiness of silver as commodity and means of exchange. In addition, the Bible has given a strong imprint on Western civilization (which includes the world of Islam). The difficulty with using the Bible as an historical source is that it is a collection of books with a long history of composition. Large parts describe an ideal society (especially as regards the laws), rather than a real society. Nevertheless it is an important window through which we can learn about mentality and world view.

In the first place we see silver as an important asset to mark wealth. It is remarkable though that silver often comes on the second place, after livestock. "Now Abram was very rich in livestock, in **silver**, and in gold" (Gen 13:2); "The Lord has greatly blessed my master (Abraham), and he has become wealthy; he has given him flocks and herds, **silver** and gold, male and female slaves, camels and donkeys" (Gen. 24: 35). In an admonition to the people of Israel before they reach the promised land we read: "¹²When you have eaten your fill and have built fine houses and live in them, ¹³and when your herds and flocks have multiplied, and your **silver** and gold is multiplied, and all that you have is multiplied, ¹⁴then do not exalt yourself, forgetting the Lord your God, who brought you out of the land of Egypt, out of the house of slavery" (Deut. 8: 12-14).

In these cases silver is more a commodity than money, but in other cases the interpretation as money is more appropriate, as in **Genesis 23: 16** (NRSV), when Abraham buys a tract of land for the burial of his wife Sarah: "Abraham agreed with Ephron; and Abraham weighed out for Ephron the **silver** that he had named in the hearing of the Hittites, four hundred shekels of **silver**, according to the weights **current among the merchants**." We encounter a system of measures, or more specifically weights: a shekel of silver, and that as is "current among merchants". The shekel in Israel is commonly calculated as being c. 11.5 grams, but we observe other standards: "the shekel of the sanctuary", as in Exodus 30: 13 about temple taxation: "This is what each one who is registered shall give: half a shekel according to the **shekel of the sanctuary** (*šeqel ha-qodeš*) -the shekel is twenty gerahs-, half a shekel as an offering to the Lord. ¹⁴Each one who is registered, from twenty years old and

¹¹ Cf. <http://www.cgeh.nl/coins-currency-and-crisis>

upward, shall give the Lord's offering." See also Exodus 38: 25 and Numbers 7: 13 and 85. A third shekel is mentioned in II Samuel 14: 26, a shekel "by the weight-stone of the king" (*be 'even ha-melek*) in the hilarious description of the hair of the handsome prince Absalom, son of Solomon, that was so beautiful and heavy that he had to cut it every year (!) and that the hair weighed 200 shekels by the weight-stone of the king.

The Israelite society was certainly not 'deeply monetized' as we learn from this law: "When any of you commit a trespass and sin unintentionally in any of the holy things of the Lord, you shall bring, as your guilt offering to the Lord, a **ram** without blemish from the flock, **convertible into silver** by the sanctuary shekel; it is a guilt offering" (Leviticus 5: 15).

We see this conversion also in this law: "If a person consecrates to the LORD any inherited landholding, its assessment shall be in accordance with its seed requirements: fifty shekels of silver to a homer of barley seed" (Leviticus 27: 16). This converting of valuables into money (silver) is especially recommended in case of long journeys, as we see in the regulations of the Deuteronomist concerning the tithes (Deuteronomy 14: 22-27):

²²Set apart a **tithe** of all the yield of your seed that is brought in yearly from the field.²³In the presence of the LORD your God, in the place that he will choose as a dwelling for his name, you shall eat the tithe of your grain, your wine, and your oil, as well as the firstlings of your herd and flock, so that you may learn to fear the LORD your God always.²⁴But if, when the LORD your God has blessed you, the distance is so great that you are unable to transport it, because the place where the LORD your God will choose to set his name is too far away from you, ²⁵**then you may turn it into money (silver)**. With the money secure in hand, go to the place that the LORD your God will choose;²⁶ spend the money for whatever you wish—oxen, sheep, wine, strong drink, or whatever you desire. And you shall eat there in the presence of the LORD your God, you and your household rejoicing together.

In the book of Ezra we read how the Persian king Artaxerxes (I or II) grants silver and commodities to returning exiles:

I, King Artaxerxes, decree to all the treasurers in the province Beyond the River (= Syria/Palestine): Whatever the priest Ezra, the scribe of the law of the God of heaven, requires of you, let it be done with all diligence, ²²up to one hundred talents¹² of silver, one hundred kors of wheat, one hundred baths of wine, one hundred baths of oil, and unlimited salt (Ezra 7: 21-22).

Prices could consist of a mixture of silver and barley. When the prophet Ezekiel is urged by God to buy a slave girl in order to marry her as a living object show to expose the life style of the Judeans, we read: "The LORD said to me again, 'Go, love a woman who has a lover and is an adulteress, just as the LORD loves the people of Israel, though they turn to other gods and love raisin cakes.' ² So I bought her for fifteen shekels of silver and a homer (= 'donkey' = 'donkey's load' = 400 l.) and a half of barley (Hosea 3: 1-2).

Prices of bulk goods are, as in Mesopotamia, described in terms of the purchasing power of silver. When during a siege of Samaria in Israel by king Ben-Hadad of Aram (840s BC) an extreme famine broke out in the city so that women ate their own children, the prophet Elisha predicted: "Hear the word of the LORD: thus says the LORD: Tomorrow about this time a seah of fine flour shall be sold for a shekel, and two seahs of barley for a shekel, at the gate of Samaria."¹³ This is apparently a very low price in view of the siege, but it is still high in view of Babylonian parallels.

¹² The Hebrew term for "talent" was *kikkār*, meaning a round gold or silver disk, or disk-shaped loaf, weighing about 35 kg. It consisted of 60 minas (*mnh*) or 3000 shekels (one mina being 50 shekels). See Appendix.

¹³ II Kings 7:1-2. The shekel in Israel weighed about 11.3 grams and the seah was about 7.3 litres.

The high value of silver and gold is also determined by the fact that it is difficult to find and to extract from ore. This is eloquently described in Job 28: 1-11. To get high quality and pure silver is an expensive process. Trust in silver is based on purity and weight. It is so important that it is part of wisdom literature and admonitions, as we can see here, in the words of the prophet Amos (c. 760-750 BC):

Hear this, you who trample on the needy
and bring the poor of the land to an end,
⁵ saying, “When will the new moon be over,
that we may sell grain?
And the Sabbath¹⁴,
that we may offer wheat for sale,
**that we may make the ephah (22 l.) small and the shekel (11.5 gr.) great
and deal deceitfully with false balances,**
⁶ that we may buy the poor for silver
and the needy for a pair of sandals
and sell the chaff of the wheat?” (Amos 8: 4-6)

The shekel is apparently not a coin or piece of silver here, but a (false) weight, so that the merchant gets too much silver for a shekel.

The fact that silver must be pure and purified in fire is an important issue and used in a metaphorical sense. We see it in the description of the instructions of Moses and the priest Eleazar to the Israelites as regards the booty taken from the Midianites. There is a strong religious component in this instruction.

²¹ Eleazar the priest said to the troops who had gone to battle: “This is the statute of the law that the LORD has commanded Moses: ²² gold, silver, bronze, iron, tin, and lead—
²³ everything that can withstand fire, shall be passed through fire, and it shall be clean. Nevertheless it shall also be purified with the water for purification; and whatever cannot withstand fire, shall be passed through the water (Numbers 31: 21-23).

The prophet Jeremiah (c. 586 BC) compares the punishment of a foreign king, who will punish the people of Judah for their defection, with the tester of metals:

²⁷ I have made you a **tester of metals** among my people,
that you may know and test their ways.
²⁸ They are all stubbornly rebellious,
going about with slanders;
they are bronze and iron;
all of them act corruptly.
²⁹ The bellows blow fiercely;
the lead is consumed by the fire;
in vain the refining goes on,
for the wicked are not removed.
³⁰ **Rejected silver** they are called,
for the Lord has rejected them (Jeremiah 6: 27-30).

We encounter the idea also in Malachi 3:3, where the prophet predicts the coming of a messenger of God: “he will sit as a refiner and purifier of silver, and he will purify the descendants of Levi and refine them like gold and silver, until they present offerings to the Lord in righteousness.” Similar in Zechariah 13: 9.

¹⁴ Before the Babylonian exile (586 BC) the Sabbath was not yet the 7th day of the week, but the day of the full moon. In the Israelite and Babylonian calendars the month was a lunar month, starting at ‘New Moon’ (day of first appearance). The Sabbath (Shabattu in Babylonian) was the day of the full moon, c. 15th.

A comparable metaphor is used by the Greek comedy playwright Aristophanes:

Many times it seems to us the city has done
the same thing with the best and the brightest of its citizens
as with the **old coinage** (*nomisma*) and the **new gold** (currency).
For these, not counterfeit at all,
but the finest it seems of all coins,
and the only ones of the proper stamp, of resounding metal
amongst Greeks and foreigners everywhere,
we never use, but the **inferior bronze** ones instead,
minted just yesterday or the day before with the basest stamp.¹⁵

That the value of silver can change and is dependent on the amount of silver is acknowledged by Biblical authors. We see it in the description of King Solomon's extraordinary wealth:

All King Solomon's drinking vessels were of gold, and all the vessels of the House of the Forest of Lebanon were of pure gold; none were of **silver**—it was not considered as anything in the days of Solomon (1 Kings 10: 21 = 2 Chronicles 9:20).

The king made **silver** as common in Jerusalem as stones, and he made cedars as numerous as the sycamores of the Shephelah (1 Kings 10: 27 = 2 Chronicles 1: 15).

The money, the silver, was of course weighed and not counted, as coinage did not exist before the Persian Period (539-331 BC). We see it in the passages quoted above (purchase of land by Abraham, Genesis 23: 16) and it is implied in Amos' admonition concerning false weights (Amos 8: 5). We see it in Jeremiah 32: 9, where the prophet buys a tract of land: "And I bought the field at Anathoth from my cousin Hanamel, and weighed out the money (silver) to him, seventeen shekels of silver." The shekel was a weight measure, not only used for silver, but also for other products. It was used to weigh gold (Genesis 24:22), cinnamon and myrrh (Exodus 30:23), hair (2 Samuel 14:26), iron (2 Samuel 17:7), and food rations (Ezekiel 4:10). But it is still true after the arrival of coinage in Achaemenid or Persian Judaea, or actually we observe a mixture of counting and weighing. The book of Ezra (3: 68-9) recounts the following as regards the return of the first group of exiles when they arrive in Jerusalem:

Some of the heads of fathers' households, when they arrived at the house of the LORD which is in Jerusalem, offered willingly for the house of God to restore it on its foundation. According to their ability they gave to the treasury for the work 61,000 gold drachmas (*zħb drkmwnym*) and 5,000 silver minas and 100 priestly garments.

The suggestion is made that it concerns coins, 61,000 gold drachmas, which is flatly impossible, as there was no Greek currency in Judah in the beginning of the Persian era. It takes the composition or final redaction of this book to the (early) Hellenistic period, but even then gold drachmas did not exist and minas and talents were not minted. Even if we take the story at face value (and take it that gold darics [*dareikoi*, Persian gold coin] were intended), then it must be assumed that the money was weighed, as we know from Babylonia (see below). A similar story is told about the return of exiles from Babylonia led by the scribe Ezra under king Artaxerxes (I or II), when Ezra weighs out the gold and silver he gets from the king, his counsellors and people and priests:

And **I weighed out** to them the silver and the gold and the vessels, the offering for the house of our God that the king and his counselors and his lords and all Israel there present had offered.²⁶ **I weighed out** into their hand 650 talents of silver, and silver

¹⁵ Aristophanes, *Frogs*, 718-726 (according to Greek text). Translation Matthew Dillon. I owe the reference to Von Reden 1995: 114. It is actually a poetic rendering of Gresham's law: bad money drives out good money.

vessels worth 200 talents, and 100 talents of gold,²⁷ 20 bowls of gold worth 1,000 drachmas (=darics³) and two vessels of fine bright bronze as precious as gold (Ezra 8: 25-7).

The emerging monetization of society, triggered by the exaction of taxes in silver, is indicated by the complaints by the people against governor Nehemiah: “We are having to borrow money (silver) on our fields and vineyards to pay the king’s tax” (Nehemiah 5: 4). Nehemiah then urges the nobles (among whom himself!) to remit the debts:

Moreover I and my brothers and my servants are lending them money and grain. Let us stop this taking of interest.¹¹ Restore to them, this very day, their fields, their vineyards, their olive orchards, and their houses, and the interest on money (silver), grain, wine, and oil that you have been exacting from them (Neh. 5: 10-11).

Silver and money in Mesopotamia

Silver was already a means of payment in the third millennium BC (cf. Krispijn forthcoming; Powell 1996). The world of the Assyrian merchant colony in Kanesh (Anatolia) is a prime example of early sophisticated use of money in the early second millennium. It is impossible to give an overview of the use of silver in Mesopotamia in the course of three millennia. There has been a lively debate on the role of (coined and uncoined) silver as money in the Antiquity (Powell 1996; Von Reden 1995 and 2007; Le Rider 2001; Jursa 2010: 469-753). We shall not go into this debate, but it is our contention (following Jursa) that silver was used as money (means of payment, means of account, means of storing wealth) already in the Ancient Near East and that it reached a fairly deep level of monetization in the Neo-Babylonian period. The standard unit of measuring silver was the shekel (*šiq̄lu* from *šaqālu*, ‘to weigh’, but also ‘to pay¹⁶’, cf. e.g. Dercksen, forthcoming; many examples in the CAD s.v. *šaqālu*) weighing 8.33 gr. Especially in the Neo-Babylonian period fractions of the shekel were in use (up to 1/24 (*girū*, ‘carob-seed’) and 1/40 (*halluru*, ‘chick-pea’) and were indeed used in daily transactions (see Appendix). Jursa argues for a fairly deep monetization in the Neo-Babylonian period, esp. in the long sixth century (Jursa 2010: 630-1).

I shall confine myself to indicate how people looked at the role of silver in their society, much as I have done in the previous chapter on the Bible.

As in the Bible silver and gold are desirable goods, are used for luxury items and are prime targets of getting booty. It is also a means to store wealth. This is poetically illustrated by the description of “The Poor Man of Nippur”:

The Tale of The Poor man of Nippur

There was a man, a citizen of Nippur, destitute and poor,
Gimil-Ninurta was his name, an unhappy man,
In his city, Nippur, he lived, working hard, but
Had not the silver befitting his class,
Had not the gold befitting people (of his stature).
His storage bins lacked pure grain,
His insides burned, craving food, and
His face was unhappy, craving meat and first-class beer;

¹⁶ The English word ‘to pay’ has another background. It is derived from Latin *pacare*, ‘to appease’, from *pax*, ‘peace’. The same idea of appeasement by paying is found in the German word for money, *Gelt*, Dutch *Geld*, ‘requital’, which is related to English ‘yield’. The German word for ‘to pay’ is ‘zahlen’, which literally means ‘to count’. So in this world paying was counting rather than weighing.

Having no food, he lay hungry every day, and
Was dressed in garments that had no change.¹⁷

Assyrian and Babylonian kings boasted that they collected huge amounts of booty and tribute, among which silver and gold are ubiquitous. We read the same boasts as regards Solomon. We see this in an observation made by king Sargon II of Assyria (722-705 BC) in one of his royal inscriptions. In this period copper, bronze and silver were used as money in Assyria, but before 712 BC copper was preponderant. In 712 Sargon II conquered Carchemish and brought home a huge amount of silver. After that campaign, silver replaced copper as the main currency and silver is measured in the mina of Carchemish (Postgate 1979: 18, Müller 1997: 120; Radner 1999: 129). We observe this in Assyrian letters to king Sargon:

To the king, my lord: Your servant Adda-hati. Good health to the king, my lord! ⁴ The silver dues of the prefects and village managers imposed on the local population have been handed over: two talents and 18 minas of silver according to the standard of Carchemish (*ina ma-né-/e\ š[a uru gar-g]a-mis*). In addition I have sent to the king, my lord, half a shekel of gold, two [tog]as and three tunics with my messenger (SAA I 176: 1-9).

The mina of Carchemish (on the Euphrates, now in southern Turkey on the border with Syria) probably represented the western weight system, current in the Levant (see Appendix).

Sargon II plundered so much booty in that campaign that he boasted that from that time on the exchange value (*mahīru*) of silver was to equal that of bronze (Annals from Khorsabad 232-4 = Fuchs 1994: 130 ff.). Actually he boasts here a reversal of Gresham's law, namely that good money drove out bad money which underscores his achievement. Modern economists would perhaps doubt if a sudden devaluation of the silver is really so good.

Many Mesopotamian texts give testimony of concern for the **purchasing power of silver**. Prices in the Near East were expressed as the purchasing power of silver rather than as prices of products, as we observed in the preceding quotation from the Bible on the siege of Samaria by Ben-Hadad. Concern for it is expressed in royal propaganda texts. From Assurbanipal's Coronation Hymn we can deduce how desirable a good exchange value of the shekel was:

⁵⁻⁷ Just as grain and silver, oil, [the catt]le of Šakkan and the salt of Bariku are good, so may Assurbanipal, king of Assyria, be agreeable to the gods [of his] land! (...) ⁹⁻¹¹ May the people of Assur buy 30 kor (= 5400 litres) of grain for one shekel of silver! May [the people]e of Assur buy 3 seah (18 litres) of oil for one shekel of silver! May [the peopl]e of Assur buy 30 minas (15 kg) of wool for one shekel of silver! (SAA III 11).

These are pious wishful thoughts with no relation to reality. More close to real life is the Neo-Babylonian king Nabonidus (556-539 BC). He boasts in his so-called Tariff Stela from Babylon that favorable exchange values were realized during his reign:

At the command of Sîn (moon god, supreme deity for Nabonidus), king of the gods, Adad (weather god) released the rain for me and Ea (god of sweet water under the earth) opened for me lavishly his sources; wealth, fertility and plenty he established in my country. 234 liters of barley for one shekel, 270 liters of dates for one shekel, 66 liters of sesame for one shekel, [x+]18 liters of oil for one shekel, 5 pounds of wool for one shekel, 1 pound of tin⁷ for one shekel, wine, the beer of the mountains, that does

¹⁷ Clay tablet from Sultantepe from the Neo-Assyrian (ca. 911-612 BC), Archaeological Museum, Ankara. Cf. Gurney 1956+1957; Maria deJ. Ellis 1974. Translation: Jean Bottéro.

not exist in my country: 18 liters of wine for one shekel of silver was the exchange value (KILAM) in my country (Schaudig 2001: 530-2, No. 3.4:2'- 12').

Now this is a propaganda text, but actually not far from the mark. The ideal exchange value was 180 liters for both barley and dates for 1 shekel and these equivalencies occurred, but prices fluctuated. In Nabonidus' reign the rate of barley fluctuated between 90 to 257.1 liters (Jursa 2010: 445) and the rate of dates up to 259.5 liters of dates per shekel are attested (cf. Jursa 2010: 585: n. 3179 and p. 593-4). The Tariff Stela shows the real concern of the king as regards the purchasing power of the shekel.

The same concern for the purchasing power of silver we find in the work of Babylonian scholars, versed in the art of divination, i.e. futurology by interpretation of omens. The study of the abundant corpus of Mesopotamian omen texts is an extremely valuable tool in understanding the concerns of ancient Mesopotamian man. Many omens mention the purchasing power of the shekel, which means that the volatility of prices was a major concern indeed. However, it is often misunderstood by Assyriologists. It is good to note that the word *mahīru*, written epigraphically KILAM, is often incorrectly translated in the dictionaries, especially the Chicago Assyrian Dictionary. The basic meaning is 'receiving' = 'what is received' in exchange for something else and in particular for silver. The basic meaning, correctly observed in the *Akkadisches Handwörterbuch* of Wolfram von Soden, 'exchange value' (AHw: 'Gegenwert, Kurs'). As a derivative the term may mean: 'Market, market place; business' (as short for *nadānu u mahīru*, 'give and receive').¹⁸ The CAD, however starts with this interpretation and applies it to circumstances that does not fit, as e.g. in the omen texts. The omens are concerned with 'good exchange values = people receive much grain for one shekel', referring to low prices, and with 'bad exchange values = people receiving little grain for a shekel = high prices'.¹⁹

¹⁸ In the Hellenistic period the Akkadian reading of KILAM seems to be representing *nadānu*, 'to give', rather than *mahāru*, 'to receive'. See an interest-bearing promissory note arising from a deposit (277/6 BC): KÙ.BABBAR *ši-mi dan-nu* KAŠ.SAG-*a* | 5-ta *lib-bu-ú na-dan šá ina* E.KI *ina* ITI.SIG *u* ITI.ŠU *in-na-an-din-nu ina-an-din-u*', "the silver, the price of the aforementioned 5 vats of beer, they will give (pay) according to the exchange value (*na-dan*) that is given in Babylon in months III and IV": CT 49, 111: 7 (= Stolper 1993, text 13 + comm. p. 44; Jursa 2006: 183; n.b.: Stolper incorrectly deletes *ina-an-din-u* as scribal error); same text: "If they do not pay at the appointed time for them, they will pay *lib-bu-ú na-dan ma-tu-ú šá* MU 43.KAM, according to the lowest exchange value of year 43 (= according to the highest price)", CT 49, 111: 8-9 (= Stolper 1993, text 13 + comm. p. 44); in a so-called Astronomical Diary from 108 BC, Parthian period, (discussed below): *na-dan ina* SILA.MEŠ E.KI TAR-*is*, "the exchange in the streets of Babylon was interrupted." Diary -107D 32'; perhaps we might translate here: the supply (of grain) was interrupted. It is a month of a peak price in grain (December 108 BC; cf. Van der Spek e.a. 2014. Appendix for the price). Note the phrase in a diary from Uruk, 464 BC: [so and so much grain etc. for one shekel of silver] *šá ina* KUR *a-na* KILAM SUM-*nu*, "which was given in the land for exchange." Diary -463: 4'. Cf. Van der Spek 2014: 7 and p. 13, n. 7.

¹⁹ It will be apparent from omen apodoses, discussed by the CAD¹⁹: KILAM *ina* KUR ŠUB *kaspu ul ibašši*, "the exchange value (of the shekel) will be annihilated, (because) there will be no silver." (KAR 427: 4). In the above quoted passage, the CAD translates "business will collapse", which is not the issue. It stresses the role of silver: when there is no silver, there can be no exchange. *Māt šarri ša sunqa imuru* KILAM *napša mātu ikkal* (BRM 4 13: 58) does not mean "the king's country that has experienced hard times will enjoy good business", but "the country will enjoy (lit. "eat" (!)) abundant exchange value (= receive abundant grain for a shekel)". My point is quite clear in these passages: *du_d+du* (=e₁₁ = *elû*) *ki.lam napāš Nisaba* (ZA 52 238: 15a) does not mean "upswing of business, abundance of cereals", but "rising exchange value, abundance of cereals" (Nisaba is the goddess of grain, accounting and writing) and *ebūru iššir* *ki.lam sig₅ gar-an* (KUB 4 63 iii 21), does not mean "the crop will prosper, the business will be good", but "the crop will prosper, (hence) the exchange value will be good (= the prices will be low)". KILAM GI.NA (or *ke-e-nu*) does not mean "business will remain stable", but "the exchange value will be fair". Bad omens also occur of course and low exchange values = high prices belong to predicted bad omens and the interpretation is more than clear: *ki.lam tur-ir mēništu ibašši*, does not mean "business will be reduced, there will be scarcity", but "the exchange value will be low, (because) there will be scarcity" (Boissier DA 232 r. 44) and even more clear in "there will be famine in the country *ki.lam tur-*

Hellenistic Babylonia: the introduction of coinage

The situation changed when Mesopotamia immediately after Alexander's conquest in October 331 BC went over from payments with bullion into payments with coins. The Macedonian conqueror introduced Greek coinage of the Attic weight standard and this became the standard in the Seleucid Empire. As Meadows convincingly pointed out, this innovation was not led by economic motives, but by propagandistic motives: the whole world could see who the new king was; soldiers, who travelled all over the world, could use the same money everywhere, in the empire, and beyond, esp. in the Greek world where the use of the Attic drachma was dominant. Very important for soldiers returning home (cf. Meadows 2014).

The metrical unit was the drachma (weighing c. 4.31 g); the didrachm (8.62 g) more or less equaled the shekel; the four drachma piece, the tetradrachm, weighing 17.25 g, also called *statēr*, was a kind of standard unit (see Appendix). A mint was established in Babylon which was very productive, as is summarized by Meadows (2014: 178): "The mint of Babylon from c. 333–318 BC probably used just over 200 tetradrachm obverse dies. At 20,000 coins struck per die that is 4 million tetradrachms (2,600 Talents or 70 tonnes of silver) entering circulation within a period of 15 years. To these figures we must add those for the gold. Using Callataÿ's methods and figures, it seems likely that approximately 14 % of all Alexander's gold coin was produced at Babylon, using approximately 140 obverse dies. At 10,000 coins per die this equates to a production of 1.4 million gold staters, 12 tons of gold, equivalent in value to almost 4,666 Talents (120 tons) of silver. These two denominations - tetradrachm and stater - alone, therefore, may have put some 7,266 talents into circulation in the new monetary medium of coinage." 7,266 Greek talents equal c. 188 tons of silver. The bullion from which Alexander produced the coins was taken from the Persian treasuries, which valued nearly 5000 tons of silver.

Is this reflected in the Babylonian cuneiform sources? One of the most important sources for our knowledge on silver and exchange values is the collection of the Astronomical Diaries from Babylon (ADART). It was the main source for the VU University project on Babylonian prices which eventually led to the above mentioned volume on the history of market performance from ancient Babylonia to the modern world. The astronomical diaries constitute a collection of data for the research into divination / futurology. One of their major concerns apparently was: the purchasing power of the shekel in relation to five basic foodstuffs: barley, dates, *kasû* (variously translated as mustard or cuscuta [dodder], used as spice for the preparation of date beer), watercress (or cardamom) and sesame, all in liters, and wool, in *minas* (pounds). The full formula is as follows: "That month: the exchange value of barley (was): *n* liters, dates *n* liters, cuscuta *n* liters., cress *n* liters, sesame *n* liters, wool *n* pounds, for one shekel of (refined) silver, (that was given in the land²⁰)". Most often the formula was abbreviated to: "That month: the exchange value was: barley *n* liters, dates: *n* liters; etc." Sometimes there is reference to scarcity, as e.g. in Diary-

ir (so that) the exchange value will be low (= the prices will be high)" (Leichty *Izbu* XI 68) and "the enemy will 'eat' the possessions of my country *ki.lam šub-ut*, the exchange value will collapse" (not: "business will collapse") (KAR 427: 4). Finally I will show how this led to the misunderstanding of a letter of a certain Baysar to the governor of Nippur: Cole 1996, No. 59: 11-14: "Concerning the property of my lord – in terms of silver it has gone up in value. I have not given (=sold) it to anyone." [(11) *áš-šú níg.šú/meš\ šá be-lí-ia* (12) *a-na /muhi kù.babbar* (13) *i-lu-ú a-/na-mam\ -ma* (14) *ul ad-di-sí*], should be translated as: "Since my lord's property went up against (one shekel of) silver, I did not sell it to anyone." He did not sell, because the price fell. Hence the interpretation is opposite the one proposed by Steven Cole.

²⁰ Cf. Slotsky 1997: 12. It is not quite clear to me what this formula, added on occasion, means: it refers either to the exchange value, 'that was given in the land', i.e. the price that was paid in the land (but I do not think that the astronomers would argue that the prices were valid in all of Babylonia), or it refers to the silver 'that was given in the land', i.e. to the silver that circulated as currency in Babylonia; cf. n 18 above.

324B 12': "[That month (II, c. May 325 BC)] the sale of barley and the sale of everything else was interrupted in the streets of Babylon until the fifth; (the exchange value of) barley: 9 liters, on the sixth and seventh: 24[+ liters ...]; in the middle of the month, barley: 36 liters; at the end of the month: 48 liters; dates, in the middle of the month 36 liters, at the end of the month 42 liters; etc." These prices exhibit hardship and extreme high prices in the time of Alexander the Great. The supply of food fell to (nearly) zero until the fifth of the month; conditions improved somewhat on the sixth day, possibly owing to the arrival of a new harvest.

Administrative documents right from Alexander's reign use the formula 'x shekels of silver in staters of Alexander' and under later kings always the reigning king. Sometimes specific coins are mentioned, such as the 'elephant staters' and the 'lion staters'. Some texts add: 'according to the counting (*manûtu*) of Babylon' (possibly referring to the exchange rate between shekels and drachmas; see for more information Doty 1979: 69ff; Van der Spek 1982: 218f; 2005; 1998: 211, 246–7; Stolper 1993: 22–3).

It is difficult to be sure if coins were always weighed (that is what the texts suggest), but it seems as though a rule of thumb emerged that one shekel equaled two drachms. See for this idea the Appendix.

In two cases an exact equation one shekel = two drachmas (or one didrachm) can be deduced from the texts. In 2002, a document was published by Michael Jursa, dated to 7 January 321 BC, recording the wages paid to five hired workers who removed the debris of the temple²¹, apparently as part of the job undertaken by Alexander the Great for the reconstruction of the temple tower (mentioned in Astronomical Diary No. –321 Rev. 14': "the debris of Esagila (temple of supreme deity Marduk) was removed to the west bank" (August 322 B.C.)). The tablet mentions the wages for 15th of month X to the 16th of month XI = 10 January to 9 February 321 B.C. The way the salary is expressed is unique in that it is given both in shekels and staters: "1/3 mina (= 20 shekels) of silver, the weight of 10 staters". It means that the weight of a Babylonian *stater* (= tetradrachm) was set at 2 shekels (16.67 gr.). This is lower than the standard attic weight of 17.2 grams, although the staters struck in the early Hellenistic period in Babylon were somewhat lighter, e.g. 16.8 gr. and thus amounting to two shekels indeed; but even lighter staters were found. Weighing of the coins remained advisable. It should be noted that in hoards from Mesopotamia coins were sometimes cut and collected with silver objects and *Hacksilber* (cf. Duryat 2014: 375).

The other text is a price list from Babylon recording prices of barley, dates, mustard, sesame, cress, sesame and wool (just as in the astronomical diaries – see below) of the years 173 -175 of the Seleucid era (Slotsky – Wallenfels 2009: 83-97, text 6 r. 12' - 15'). It gives two distinct exchange values of barley (for two shekels of silver = c. 1 tetradrachm!) for month III 175 SEB = 27 May – 25 June 137 BC: 84 liters in staters of Demetrius and 72 liters in staters of Arsaces²². Slotsky and Wallenfels observe (2009: 94, n. 65): "The increased purchasing power (+6%) of the Demetrius staters is almost identical to the greater average weight of silver tetradrachms minted at Seleucia on the Tigris by Demetrius II (+6.7%) over those of Mithradates." The document refers to the time shortly after the abortive attempt of Demetrius in 138 BC to reconquer Babylonia from the Parthians. In his short reign a few months he was able to introduce new coins, which had a higher weight than the Parthian coins. After the demise of Demetrius (he was captured), his coins remained in use for some time. The strange thing is that coins, produced by a foreign enemy, enjoyed more trust than coins of the reigning king. But the issue might simply be weight of the coin and the two shekel measure of this tablet apparently is simply the coin: a two shekel piece = tetradrachm

²¹ Jursa 2002: 120 Nr. 8.

²² All Parthian kings had the throne name Arsaces. Mithradates I was king.

of Demetrius buys 84 liters of barley, while the lighter two shekel piece = tetradrachm of Arsaces is good for 72 liters. We must conclude that the shekel, at least in this period, wasn't a weight measure of silver bullion anymore, but a coin. It partly explains the higher prices in the Parthian period, as the weight (and content) of the Arsacid coins further deteriorated (though this cannot explain everything).

Apart from the numerous passages recording the prices, silver and gold are mentioned a few times more, unfortunately mostly not with much context. An intriguing text is the diary concerning month VIII (November) 303 BC: "113 talents of silver, 2 talents of gold of Nabû, which at the disposal of x [.. .. to/from?] the house of the craftsmen and the streets of Borsippa they brought x [.. ..]". It is an enormous amount of money enough to feed an army during a whole year of 18,620 soldiers at the rate of one liter of barley per day at the exceptional high prices that were current in 309 and 308 BC (Van der Spek 2000: 302). It is not unthinkable that this money was taken by the government to be melted down for the minting of money for the army of Seleucus I who was preparing the final battle of Ipsus in 301 BC against his rival Antigonus the One-eyed. Another interesting passage is the expression 'silver of the heads' which probably stands for a poll tax.

- r7': ... That month, one G[ree]k man
- r8': [.. .. 'the silver] of the heads' from month I to Babylon [.. ..]
- r9': [.. ..] rai[sed] a complaint [.. ..]
- r10': [.. ..] of the 'silver of the heads'; every single person [*should pay*?] ½ shekel [.. ..]

(Diary – 183A, concerning month II of Seleucid year 128 = 8 May – 6 June 184 BC)

I deduce that half a shekel of silver (= 1 drachma) was raised, perhaps as a war tax; cf. fragment of diary -183C concerning same month: "of the silver of the heads he brought out". It seems as though a certain Greek was raising taxes to the dismay of the Babylonian population. The same expression occurs in the so-called Lehmann text, the record of a royal land grant to Babylonians, in which royal land is parceled out to inhabitants of Babylon and the tracts are freed from all kinds of tax, among which the KÙ.BABBAR šá /SAG[DU].MEŠ, "the silver of the head tax" (CTMMA IV, no. 148A: 14). I mention finally AD -261C, r11: "That year, silver and gold, garments and linen [.. ..][.. ..] was placed in the royal palace in Babylon for protection against the enemy."

Bronze money is mentioned only once, and that in the time of famine, high exactions of tribute in silver and commodities from king Antiochus I in view of his military campaign against Egyptian forces in the first Syrian war. It is a diary concerning the 38th year of the Seleucid Era (274/3 BC) (Diary no. -273B; full passage at <http://www.cgeh.nl/translation-astronomical-diary> :

- 30': Month XII, day 24 (26 March 273 BC): the satrap of Babylonia, sent^{1. 32} much silver, clothing, goods and equipment?
- 31': from Babylon and Seleucia, the royal city, and 20 elephants, which the satrap of Bactria has sent to the king, to Syria
- 32': to the king. That month, the general assembled the royal army which was in Babylonia, from its beginning to its end, and he went to the aid of the king in Month I to Syria.
- 33': That year, purchases in Babylon and the (other) cities were made with Greek bronze coins. That year, there was much *ekketu*-disease in the land.

...

Upper edge of the tablet:

1: [That year] there was [fa]mine in Babylonia, people sold their children for silver. People died of [... ..]. That year, [there was much] *ekketu*-disease [in the land.]

2: [Pur]chases in Babylon and the cities were made with Greek bronze coins. Year [38], Seleucus and Antiochus king[s].

3: Regular observations from month VII of year 38 to the end of month XII of year 38, Antiochus and Seleucus (being) kings.

Nevertheless the barley prices were given in silver (36 liters for one shekel, which is an extremely low exchange value and means famine, as is indicated by the astronomer. An exchange value of 120 liters is more or less standard, but with enormous deviations). Also the children were sold for silver, which seems strange in such a period of scarcity of silver. I have discussed this text at length in Van der Spek 2000: 305-7. For now I want to make the following observations.

1. Although silver is scarce (but see below 5), people do not turn to barter, but to bronze, which is a sign of a highly monetized economy.
2. The barley prices are given in silver, in spite of the fact that purchases (the Akkadian has KILAM = *mahīru*, which in this case indeed must mean ‘exchange of goods; purchase’) are made in bronze. It means that in normal times bread was bought with silver (tiny silver coins of 0.09 grams, the *hemitartemorion* = 1/8 of an obol, which is 1/6 of a drachma existed), but now it was converted into bronze coins, which happened elsewhere too. In this period of high prices (October 274 to April 273, when a liter of barley cost 0.23 grams; this could be paid with one *trihemitartemorion*, which weighs 0.27 grams).
3. The phrase ‘people sold their children for silver’ should not be taken too literally. In the first place: it is a well-known omen apodosis and is thus formulated here in the relevant formula. What actually did happen is that people could not pay their debts in silver and gave their children instead. Not without reason the verb *pašāru* (BÚR) is used here, what literally means ‘to make loose’; they had to hand over their children for silver.
4. One would expect low prices of silver in times when silver is scarce. That this is not the case here, I explained by assuming that not only silver was scarce but grain as well. There was famine. It was a time that the General of Babylonia was raising an army for Antiochus’ campaign. It must have resulted in thousands of extra mouths to feed in and around Babylon in this period, while at the same time grain was stored in view of the campaign for the baggage train of the army.
5. Reinhard Pirngruber argued in his dissertation (Pirngruber 2012: 74-76 and forthcoming) that it is very doubtful if there was a scarcity of silver in this time. In times of war the government usually mints a lot of money to pay soldiers and he indeed argues for this, as the mint of Seleucia on the Tigris throughout the reign of Antiochus I was very productive. In addition, bronze coins were not new. The high requisitions of money may have encouraged the Babylonians to use bronze instead of silver, that they hid. In other words bad money drove out good money. From Panos Iossif (2014) we learn that hoarding of silver had begun already in 281, when Seleucus led his abortive campaign to conquer Macedonia, but was killed. The period around 274 also witnessed a sizable hoarding. One should, however, not ignore the express statement of the astronomer that much silver from Babylon drained off to Syria!

Summarizing the evidence from Hellenistic Babylonia one may conclude that Babylonian scholars had a keen interest in the purchasing power of silver. This is apparent from the diaries, where they meticulously noted down the exchange value between silver and a couple of foodstuffs and wool. In addition they produced lists of these equivalences, which demonstrate their interest in this particular topic. The fact that they used the shekel is explained by the fact that they continued a practice that was centuries old. This conservatism we also encounter in the use of ancient geographical names. It fits in with the language of age old omen collections. But it also shows an intensive concern for the role of silver in society and the consequences of the volatility of it for the welfare of the people. The interest is also apparent in the omen texts. They were well aware of the relation between currency and crisis.

The impact of silver on the economy

It is widely acknowledged that the production of coinage by states in Antiquity was not motivated by economic reasoning, but by the wish to pay soldiers and laborers on public works and finally to facilitate taxation. The fact that Alexander introduced coinage in a world where trade with silver bullion had been successfully conducted for millennia was led by motives of political propaganda and the standardization of payments to soldiers, who mainly came from the west, where coinage was common. The choice for coinage was taken much earlier in the Greek world. Alexander's policy created a large unified area from Greece, where the Attic weight standard prevailed, to Afghanistan. This had an economic advantage over the different currencies of the Greek and former Persian world and diminished transaction costs. Yet it was not motivated by that, as Meadows (2014) rightly observes. After the demise of this empire, local currencies emerged again (among other regions in the Ptolemaic empire) for reasons of national pride. There is, by the way, nothing new in this. In all countries of the European Union one can find people and parties who long for the return to local currencies. The fact that the United Kingdom did not opt for the Euro was not primarily dictated by economic motives (although they were presented of course), but was dictated by national pride. Modern man, including the modern politician, does not really fit in with the ideal-type of the *homo oeconomicus*. The difference between the currency of the Euro and the Hellenistic world is, that silver was the standard money stuff which allowed comparison by weight of different currencies and denomination. And this happened on a large scale in the Seleucid empire. But fiduciary money was not absent in Antiquity. The silver's purity was a matter of trust and distrust (was more or less guaranteed by the coin legends) and bronze coinage was not based on intrinsic value at all. In addition, bonds, checks and credit notes were used as means of payment throughout Mesopotamian history.

Concluding remarks on markets and money²³

Market

From time immemorial people have exchanged goods. Hunters brought home their prey and shared it in the community in exchange for services at home. Friends gave presents to and received presents from each other, mostly in order to get something back: *do ut des*, I give in order that you give. The gift exchange can develop into a sophisticated exchange of necessary goods embedded in all kinds of social customs and values (Marcel Mauss 1923-24). In more complex societies people can obtain desired goods by barter, often after a long ritual of bargaining, and barter gets facilitated if there is one commonly valued and accepted means of exchange. In very early times silver took that role and it is stunning that this remained so for

²³ These concluding remarks are mainly from the concluding chapter of Van der Spek, van Leeuwen & Van Zanden 2015 [2014]. See further Van der Spek 2014a and b; Van der Spek & Van Leeuwen 2014; Pirngruber 2012.

about 5,000 years. This acceptance of silver is based on social values and irrational trust: why did people accept silver for any good when it is a commodity that you cannot eat, nor make clothes of, nor live in, and is not suitable for making utensils? Yet it was an important means to get desired goods, to hoard wealth, to provide prestige, to become rich. It helped enormously to fix values and to set what we now call 'prices'.

But is all this exchange of goods evidence of the existence of a market? Is in all these cases a free exchange of goods at stake in which the value is decided on the basis of the relative scarcity of supply and demand? Is the economic history of mankind the history of the free market or do we have to evaluate each society taking restraints, values and tradition into account?

Presently many economists and especially neo-liberal politicians adhere to the idea that the free market is the motor of the economy and will indeed bring prosperity owing to Smith's invisible hand. The failure of communism has become apparent since 1989 and the official policy of the European Union is that the state should retreat, that all kind of tasks that the state had acquired (such as public transport, mail services, health care) should be left to the free market, even in branches where competition is hardly possible. Contracting out a railway line is hardly furthering the free market, rather the granting of a monopoly for some years. The customer, however, has no choice when he wants to travel from A to B. Yet everything is supposed to be better than state control.

On the other hand, economic historians, especially historians of antiquity, have long been under the spell of Polanyi, denying the applicability of modern economic theory to the ancient economy, and arguing that factors of status and tradition played a larger role than laws of supply and demand. It led to a long enduring battle between 'primitivists' and 'modernists'.

Who is right and who is wrong? It is my opinion that both are right and both are wrong. The mere fact that through the ages there was discussion about the just price shows that everybody knew that prices were not set by the 'commonly accepted' value, but by the law of supply and demand. The traders in the Old Assyrian colony in Kanesh (SE Asia Minor) were keen on finding ways to maximize their profits in the nineteenth century BC and used remarkably modern instruments, such as the check payable to bearer, investment loans and investments companies paying dividends (Veenhof 1997). Traders and people were well aware of the price differences in different regions.

Is then the reasoning of people like Karl Marx and Karl Polanyi (and in their wake historians such as Johannes Renger and Moses Finley) completely wrong? Certainly not. It is true that markets sometimes are not efficient and do not perform very well. In Ancient Babylonia interest rates were for a large part dictated by custom. So it is evident that interest on 1 mina (pound) of silver was ideally one shekel per month = 12 shekels per year = 20 per cent. That is a kind of iconic interest and we see it often in the documents. Yet the law of supply and demand did its work. We do find deviating interest rates. The same is true for food prices. The Babylonians had a view on a 'just price' of grain and dates: 1 shekel (8.33 g.) silver is the exchange rate of 1 *kurru* (180 l.) of grain or dates, which corresponds to an iconic salary of 1 shekel of silver per month. In Rome a kind of iconic price existed as well: in c. 250 BC a *modius* (about 8.6 l.) of grain was valued ideally as 1 bronze *as*, and this was later changed (c. AD 64) to 1 silver *denarius*. Though these prices were sometimes real, the very fact that the Babylonian astronomers daily recorded the exchange rate of the shekel proves that they were well aware of the daily reality and the unpredictability of prices. They even made study of the prices, as is shown by the commodity price lists.

Yet Polanyi was right in stating that the economy in antiquity was not an abstract formal ubiquitous power monitoring exchange of goods, but that it was embedded in society, was directed by informal rules and conventions. He was not right, however, in setting the

modern economy apart. We must accept that in antiquity as well as in modern times the law of supply is valid, but we must also accept that the modern economy cannot be studied ignoring societal forms, rules, values, habits and paradigms that shape the possibilities and limitations of free exchange of goods and services. A rational profit maximizing *homo oeconomicus* did not exist in antiquity, but nor does it in our age – even now, economic decisions are also based on ideas of fairness and reciprocity, as experimental economics has demonstrated.

So what we have done in our research project at VU University is study the market through the ages, from Ancient Babylonia to twentieth century AD Belfast. We did not ask whether there was a market, but how it functioned, how it performed. We did this in a fairly formal manner, namely by quantification, by measuring. One of the tools to measure market performance is to look at and analyse price data. Histories of prices are not new. But most of these studies start with the Middle Ages. The innovative aspect of our research is that we are now able to extend the history of prices by one-and-a-half millennium, thanks to the availability of a huge amount of quantitative evidence from Ancient Babylonia, which allows a true statistical approach. Another feature of this book is that we clearly define what we are doing, what we mean by efficient and well-performing markets (which appear not to be the same).

How did we define these concepts and what did we learn from applying them to price series? A market performs well if it has the ability to cope with unexpected shocks, such as climatic shocks, wars, and human and crop plagues. Factors that directly enhance a market's capability to deal with such shocks are trade (which makes it possible to reduce shortages by imports of foodstuffs), storage (inter-temporal risk reduction by storing food from the previous harvest, technology (increasing output and making production less vulnerable to, for example, natural disasters) and consumption (diversification of consumption means that people have the possibility of consuming other foodstuffs when one harvest fails). To this we may add two other factors that indirectly (i.e. via the four previously mentioned factors) affect market performance, namely institutions (for example government actions can reduce risks by the appropriate policy measures, reduce monetary fluctuations) and geography (e.g. having navigable waters increases trade).

Methodologically, many different ways for calculating the working of markets can be distinguished. Some authors focus on the co-movement of prices in different cities, which is closely related to trade and, as trade is only one of the indicators of market performance, only partially captures market performance. Other researchers focus on the speed of adaptation of prices to a standard price level. This is connected to market performance as, for example, trade may speed up the return of prices to their standard levels. But again this does not capture all aspects of market performance, such as consumption diversification etc.

We therefore used a third method to analyse market performance, i.e. the volatility of prices. We did this by computing the standard deviation²⁴ (or rather co-efficient of deviation²⁵) of the Babylonian prices and compare these with the results from other regions and periods. So we could take back this research into an unprecedentedly long period of time – the history of Babylonia (south Iraq) in the later part of the first millennium BC. Point of departure was the study of the grain markets in Europe, 1500–1800, by Karl Gunnar Persson (1999). Focusing on the long-run factors affecting market performance, he argued that, in terms of institutions, market performance increased over time thanks to a diminishing intervention of the state (state intervention to regulate prices and to store food for times of

²⁴ Standard deviation (SD) is the mean deviation of the mean in absolute numbers. High SD = much volatility, low SD = low volatility

²⁵ Is standard deviation divided by the mean. It indicates relative spread. High CV = much volatility (close to 1), low CV = low volatility (close to 0).

shortage was hardly of any avail) and consequently a freer market emerged. Another (though not *per se* contradictory) perspective is presented by the work of Douglass North (North and Thomas 1973; North 1990). He stressed that institutions working well may lower transaction costs and, for example, increase trade. From this vantage point it is clear that the state (as the most important institution) may have an essential role in market performance in the form of lowering transaction costs by, for example, providing a good legal framework.

But the state did not only have an effect (for good or bad) on the legal framework. It could also influence the market via the other factors influencing market performance such as technological development, storage and consumer diversification. For example, markets also improved via increased productivity caused by the invention of steam power and the building of a railway network, originally by private companies, but later for efficiency reasons taken over by the state in most countries (the present policy of privatization in the EU is in this respect historically speaking a step backwards). In the same vein the state has in all times been important as an upholder of justice, builder of roads, provider and protector of a reliable means of exchange (silver, money), defender of safety and security on the roads and so forth. The state has always been important as investor, even if these investments were not done for the sake of improvement of economic performance. When the state built roads to make transports of armies easier, it also facilitated trade. When the state built harbors and ships to wage war on sea, it also facilitated off-shore trade and provided employment for thousands of people working in the harbors, such as shipwrights, rope-makers and sail makers. When Babylonian kings or Roman emperors built walls, temples and palaces, they provided work for construction workers. When kings issued money to pay armies for some campaign, they inadvertently promoted the circulation of currency and collateral expenditures. The monetization of the Hellenistic Near East was much furthered by the minting of silver for the payment of the armies. Keith Hopkins (1980) argued that the stationing of armies at the borders of the Roman empire was fundamental to the development of the local economy and trade routes between the center and the periphery and we see a diminishing market economy as soon as the armies leave. Aarts (2014) and Buringh & Bosker (2014) demonstrated that the market economy at the borders of the Roman empire depended on the existence of the Roman army.

So it seems that market performance and hence economic activity thrived in states with a strong and active government. The most flourishing economies are those of Babylonia in the Neo-Babylonian empire (sixth century BC), Athens in the time of the Delian League (fifth century BC), the Roman empire in the first centuries of the common era, the Mediaeval cities in well-organized city states and developing central states, Venice, the Dutch Republic and England in the early modern period and the United States after its unification and rise to world power. In most of these cases the intervention of the state was not intended to be for the benefit of the economy, but the measures inadvertently facilitated market performance. Of course, the policy of states can be detrimental to the economy as well. The fact that the Neo-Babylonian empire fell to the Persians in 539 BC, may have been good for Iran, but it was bad for Babylonia, as much of the surpluses now were drained off to the Persian capitals Susa and Persepolis, while factor markets were hindered by the allocation of lands to royal princes and other favorites (Jursa 2014). The circulation of coins in the later Hellenistic period in western Asia was fragmented due to the crumbling of the Seleucid empire. And to take an example from contemporary history, George W. Bush II, the president of the United States between 2001 and 2009, whose credo it was that the market should be free and that the state should retreat as much as possible from economic life, had an unheard-of impact on the American economy. His attack on Iraq in 2003 combined with tax reduction, an unprecedented combination, contributed hugely to the vulnerability of the American economy, creating a state deficit of a thousand billion dollars and making China the major

creditor; by neglecting to maintain the infrastructure thus raising transaction costs, and by deregulating the supervision of the banks and the stock markets the foundations of the bank crisis of 2008 were laid. Iraq itself is another example. Iraq has the same favorable geographical conditions for (irrigation) agriculture as in antiquity and is even richer thanks to the presence of oil, yet its population is poor, due to a failing state.

One should be wary of trying to find one linear development from poor market performance to better market performance. But there does appear to have been a general trend upwards, although certainly with ups and downs and regional differences, as we examined in more detail in the edited volume on market performance. Market efficiency, however, did not change much since antiquity. Apparently, despite all information coming to us via modern communication technology such as the internet, people are just as unable nowadays to outsmart the market of primary products as they were in Babylonian times 600 BC. One might adduce here a famous dictum by John Kenneth Galbraith: ‘The only function of economic forecasting is to make astrology look respectable.’ The ancient Babylonians found astrology respectable, as they made their databases of prices and celestial observations exactly with the aim to be able to predict prices (Van der Spek, Van Leeuwen & Van Zanden 2015 [2014], p. 542).

Silver and money

We have seen that in Mesopotamia and the Levant the role of silver is basic for the functioning of the economy from the third millennium BC through the Hellenistic period. Silver and to a lesser extent gold were the basic anchors of the economy, they constitute the money stuff par excellence. The Ancient Near Eastern Economy was monetized to a high degree, and one might add ‘deeply monetized’ since the sixth century BC, especially in Mesopotamia. Silver worked well as means of payment and means of account. It provided confidence, trust, in negotiating transactions, in establishing values of goods and in storing of wealth. Silver and gold are important items in literature, admonitions, propaganda texts and scholarly work, such as the astronomical diaries and price lists. Purity is an ongoing concern. Availability of silver is on continuous concern for kings and governments. Purchasing power of silver is something that fascinated all kinds of people.

Silver is sought and found in regions far away and mined in difficult circumstances. Very often we do not know where the silver comes from. We know that silver was not found in Mesopotamia; nevertheless even there silver was the main currency. It was obtained mainly by conquest, plunder, taxation and international trade. Babylonian textiles were an important export product throughout ancient history. The relative importance of these factors is hard to establish.

Availability of silver is the motor of the economy. Dearth of silver coincides with periods of economic and political weakness. We see this in the Late Bronze Age in Babylonia under the Kassites, when silver was scarce and gold became more important (see Kleber forthcoming). This is usually a sign of weakness, as it was in the Later Roman Empire when silver decreased in value and trust and gold became the leading metal.

Silver as currency can hardly work well without institutions. Kings and temples establish fixed weights and guard purity. Kings procure the import. Kings stimulate (unintentionally) the economy by investing in city building, canalization, military campaigns. The campaigns are to a large extent destructive of course, but successful warfare is the basis of the wealth of many ancient states, such as Assyria and the Persian empire. Evidently not for everyone: what is good for the core is not good for the periphery; Babylonia suffered from the fact that it changed from core to province. The author of the book *Ecclesiastes* (Judaea, Hellenistic period) saw it correctly: silver meets every need.

Appendix 1: Overview of Near Eastern History

Year BC	Greek world	Egypte	Levant and Asia Minor	North Mesopotamia	South Mesopotamia	
3000		Early dynastic Dyn. 1 Menes			Early Dynastic I-III Gilgames of Uruk 2700	
2900						
2800	Early-Minoan/ early-Helladic					
2700						
2600		OLD KINGDOM Dyn. 3 Djoser Dyn. 4 Cheops (c. 2575), Chephren, Mycerinus. Dyn. 5-6			Sumerian citystates <i>Kis, Uruk, Umma, Lagas, Ur, Nippur</i>	
2500			Byblos			
2400						
2300			<<< Empire of AKKAD Sargon (c. 2350)			
2200				Gudea of Lagash		
2100		1st Intermediate period (2150-2000)		<<< Empire of UR IIIrd Dynasty		

Year BC	Greek World	Egypt	Levant and Asia Minor	North Mesopotamia	South Mesopotamia	
2000	Middle Minoan/ Middle Helladic	MIDDLE KINGDOM Dyn. 11-12 Sesostris III		<i>inursions of Amorites</i>		
1900			<i>Assyrian commercial colony at Kaneš</i>	Assur citystate	Dyn. Isin and Larsa	
1800		2nd Intermediate period Dyn. 15-16 Hyksos		ASSYRIA Old Ass. period	BABYLONIA Old Babylonian Empire Hammurabi (c. 1700) <i>Lawcode</i>	
1700			Old Hittite Kingdom	<<<		
1600	MYCENAEAN Late Minoan/ Late Helladic c. 1450 Mycenae conquers Knossos	NEW KINGDOM Dyna. 18 Hatshepsut Tutmosis III Akhnaton (c. 1360) Tut-ankh-amon Dyna. 19 Ramzes II (1279-1212)		Middle Assyrian period	Middle Babylonian period Kassite domination	
1500						Mitanni
1400			Syr/ Pal. Thut mose III			NEW HITTITE KINGDOM Suppiluliuma (c. 1360) 1275: Battle of Kadesh
1300						
1200	SEA PEOPLES			Aramaeans and Chaldeans		

Year BC	Greek world	Egypt	Levant and Asia Minor	North Mesopotamia	South Mesopotamia	
1200	S E A P E O P L E S			Aramaeans and Chaldeans		
1100	DARK AGES	3 rd Intermediate period (1100-715) Dyn. 21 Dyn. 22-23 (Libyan dyn.)			ASSYRIA	BABYLONIA Nebuchadnezzar I
1000			Israel: David, Solomon			
900			Israel	Judah Jerusalem		
800						
750	ARCH. PERIODE Peloponnesos Macedonia Cylon 492 Salamis 494 Platoneus Cleisthenes 508	Late Period Assyrian domination (671-655) Dyn. 26: Sais Psammetichus I (655-610)	Assyria 722 provinces	Assyria Mesopotamia	NEO-ASSYRIAN EMPIRE Tiglath-pileser III (745-727) Sargon II (722-705) Sennacherib (705-681) Esarhaddon (681-669) Assurbanipal (669-631) 612: fall of Nineveh	
700						
600				586 Bab. Babylonia	NEO-BABYLONIAN EMPIRE (612-539) Nebuchadnezzar II (605-562)	
500	CLASS. PERIOD 490 Marathon 480 Salamis 431-404 Peloponnesian War 386 'King's Peace'	Persian domination (525-404 - Dyn. 27 ca. 341-332 - Dyn. 31)	PERSIAN EMPIRE Cyrus II (559-530) Cambyses (529-522) 525 > Egypt Darius I (522-486) Xerxes (486-465) Artaxerxes I (464-424) Darius III (336-331/0)			
400						
ALEXANDER THE GREAT (336-323)						

Empires of the first millennium BC

- Neo-Assyrian empire [Nineveh] (... - 612)
- Neo-Babylonian empire [Babylon] (612 – 539)
- **Persian** or Achaemenid empire [SW Iran] (539-331)
 - Cyrus (539-530)
 - Darius I (522-486)
 - Xerxes (486-465)
 - **Artaxerxes II (405-359)**
- **Alexander the Great** [Babylon](331-323)
- **Wars of the 'Successors'** (323-301)
- **Seleucid** Empire [Babylonia, Syria, Asia Minor](311 – 141)
 - Seleucus I (311-281)
 - Antiochus III (222-187)
- **Parthian** empire [Iran; Ctesiphon](141 BC – AD 224)
 - Mithradates I (165[?] /141 (Babylon) – 138 ill/132 †)
 - Mithradates II (121-91)
 - Last dated diary 61 BC

Appendix 2

The silver weight systems of Mesopotamia, the Levant and Greece.

The weight systems of Mesopotamia, the Levant and Greece are quite similar and originate from Mesopotamia.

Mesopotamia (source: livius.org)

1 talent (GÚN; <i>biltu</i>)	= 60 mina	= 3600 shekel	= 30.00 kg
	1 mina (MA.NA; <i>manû</i>)	= 60 shekel	= 500 gr
		1 shekel (GÍN; <i>šiq̄lu</i>)	= 8.333 gr

Four weights found in Persepolis indicate that the mina was 499.80 gr.

Subdivisions of the shekel:

- 1 shekel = 2 divisions (*zûzu*) or half shekels
 - 1 division = 4.17 gr = ca. 1 Greek drachm
- 1 shekel is 8 slices (*bitqu*)
 - 1 slice = 1.04 gr
- 1 shekel = 12 grains (*mahat*)
 - 1 grain = 0.69 gr (Parthian, Late Achaemenid?)
- 1 shekel = 24 carat (*girû*)
 - 1 carat = 0.35 gr
- 1 shekel = 40 chickpeas? (*hallûru*)
 - 1 chickpea = 0.208 gr
- 1 shekel = 180 barleycorn (ŠE, *uṭṭetu*)
 - 1 barleycorn = 0.0463 gr

The purity of silver:

Silver in the Neo-Babylonian and Achaemenid period contained 1/8 alloy, i.e. silver had 87.5 % purity. Sometimes silver is characterized as *qalû*, 'pure'. The tetradrachms of the Hellenistic period had purity well above 90%. Cf. Vargyas (2001) 13-17; Mørkholm (1991) 5; Jursa 2010: 474-90. N.B.: *halluru* = 1/24 of a shekel, not 1/10 as is indicated by the dictionaries AHw and CAD; for the correction: see Powell 1987-90: 511-2.

Weights in the Hebrew Bible (based on Levantine custom)

	talent	mina	shekel	beka	gerah
talent	1				
mina	60	1			
shekel	3,000	50	1		
beka	6,000	100	2	1	
gerah	60,000	1,000	20	10	1

Note that the ratio of the Mesopotamian to the Levantine shekel is 60:50 to the mina, like the ratios 3600:3000 shekel to the talent and 24:20 girû/gerah to the shekel.²⁶

N.B.: Ezekiel 45: 12, an admonition to use honest weight standards, is enigmatic and seems to imply a Babylonian subdivision of the mina: “¹²The shekel shall be twenty gerahs. Twenty shekels, twenty-five shekels, and fifteen shekels shall make a mina for you.” This amounts to 60 shekel for a mina, but note that the Greek translation of the Hebrew Bible, the Septuaginta, reads: “five shekels shall be five shekels, and ten shekels shall be ten shekels, and your mina shall be fifty shekels”. This interpretation can best be understood by the habit of the Septuaginta to translate Hebrew measures into Greek ones:

Kikkar (*kk*r) = *talanton*

Maneh (*mn*h) = *mnâ*

Shekel (*š*q^l) = *didrachmon* (sometimes *siglos*)

Beqa^c (*bq*^c) = *drachmē*

Gerah (*gr*h) = *obolos*

The problem with this is that this roughly fits the Babylonian weights, but not the Hebrew weight system. The Hebrew shekel was about 11.5 grams, the Babylonian shekel 8.33 grams, while the weight of the didrachm was 8.62 gr according to the Attic weight system prevailing in the Seleucid empire, but only 7.14 gr. in the Ptolemaic standard. I see two explanations for this. Either the translators did not care much about weight and wanted to translate Hebrew words to a terminology that was understandable for the target group (and indeed the system of subdivision of the Greek and Hebrew weights is similar indeed), or they took over an equation between the shekel = two drachmas, that seems to have got a general acceptance in the Near East. We see this in Babylonia, but also in Elephantine (Upper-Egypt, close to Assuan). Two Elephantine papyri from the end of the fifth century BC equate one stater (= tetradrachm) with two shekels (Tal 2007: 22, n. 11; Powell 1987-90: 511). One text adds that the stater is “Greek silver” (*ksp ywn*). Tal ascribes this equation to Babylonian influence (Tal 2007: 24). The influence may effectively be Persian-Babylonian, as 10 Babylonian shekels equate 1 Persian *karša* (83.3 gr.) and are equal to 5 Greek staters according to one of the papyri. 6 *karša* = 1 Babylonian mina. Other evidence, assembled by Powell 1987-90: 513: 1/24 shekel is assumed by Isidorus of Sevilla (AD 600-36), *Etymologiae* XVI 25.10: *ceratum oboli pars media est*, “the gerah is a half obol”. Pollux (time of emperor Commodus), *Onomasticon*, IX 62, refers to the 5th century comic poet Crates, where 1/12 daric=shekel of gold is equated with 8 obols of silver, a way of telling that the gold : silver ratio was 1:8.

²⁶ But note Tal’s observation: “According to the Bible one *sheqel* denomination equals twenty *gera* (Exodus 30:13; Leviticus 27:25; Numbers 3:47; 18:16; Ezekiel 45:12). The archaeological evidence favors one *sheqel* equaling 24 *gera* (Kletter 1998:80–83, 140, Fig. 11). The two ratios for the *sheqel* / *gera* relationship—biblical 1:20 and archaeological 1:24—suggests there were two different denominations, a *sheqel haqodesh* and an (unqualified) *sheqel*, the latter used in daily transactions.” Tal 2007: 19, n. 5.

Greek (Attic) Coins (source: www.livius.org)

1 talent (to <i>talanton</i>)	= 60 minae	= 6000 drachms	= 36,000 obols	= 25.86 kg
	1 mina (<i>hē mnā</i>)	= 100 drachms	= 600 obols	= 431 gr
		1 drachm (<i>hē drachmē</i>)	= 6 obols	= 4.31 gr
			1 obol (<i>ho obolos</i>)	= 0.72 gr

- Alternative values:
 - 1 talent = 21.45 kg
 - 1 mina = 357.5 gr
 - 1 drachm = 3.58 gr
 - 1 obol = 0.60 gr
- 1 stater (*ho statēr*) or tetradrachm = 4 drachms = 17.24 gr
- 1 didrachm = 2 drachms = 12 obols = 8.62 gr
- 1 obol = 8 chalkoi
- 1 *deben* silver (Ptolemaic demotic) = 20 drachms

Persian coinage

Persian coinage is relatively recent. King Darius I (522-486) introduced a golden *dareikos* weighing one Babylonian shekel (8.33 gr.). The *dareikos* was subdivided into 20 silver *sigloi* (Greek word apparently derived from shekel) weighing 5.4, later 5.6 gr. (cf. Tuplin 2014), thus far from any other shekel in the Near East. To distinguish it from the regular shekel, it was termed *siglos Mēdikos* by the Greeks. It probably represented the half Croesus stater, which weighed 10.75-10.90 gr. It is also roughly equates 2/3 of a Babylonian shekel (= 5.55 gr.). At a siglos of 5.6 gr. the ratio gold – silver is 1:13.45, the rate at a siglos of 5.4 gr is 1:12.96. The last figure comes closest to Herodotus (III 95), but he gives an order of magnitude I would say. Note also that the weight of the shekel is not exactly 8.33, but it cannot be far off the mark. Cf. Le Rider 2001: 154-64 for a discussion of the weights and the gold-silver relation.

Appendix 3

Some graphs concerning prices for Hellenistic Babylon

Fig. 1: Some basic price trends

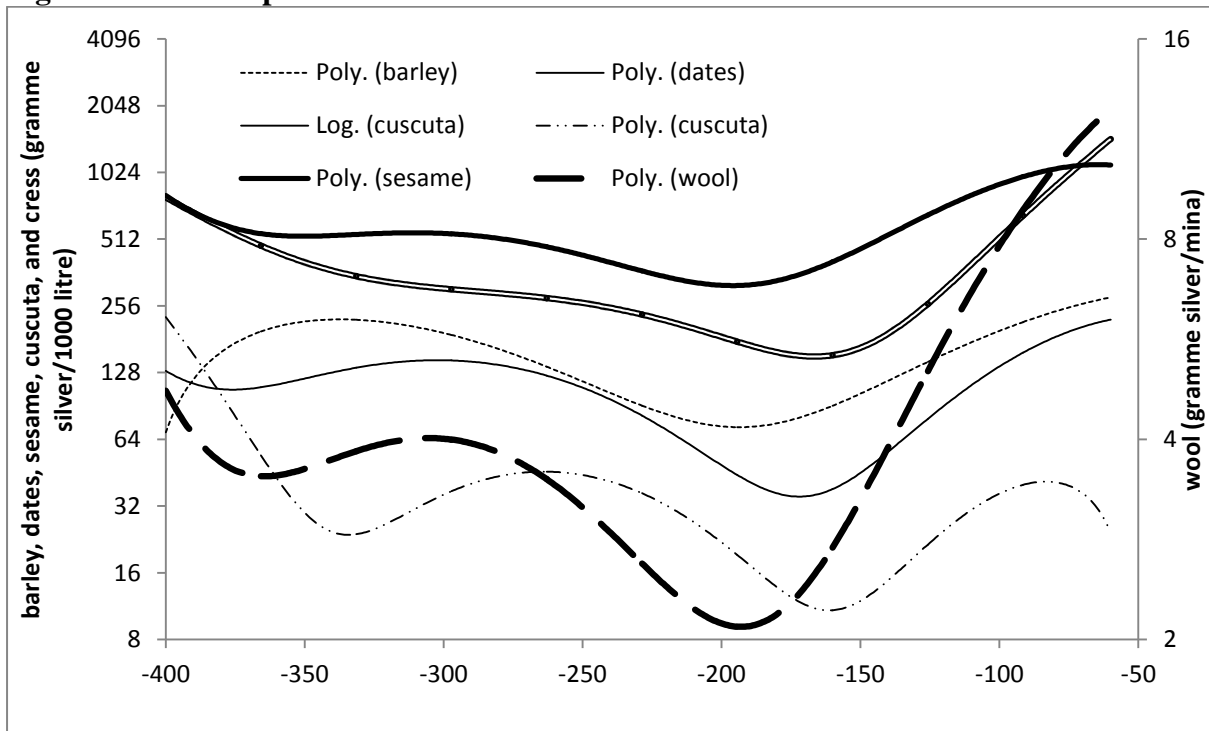


Fig. 2: Highest and lowest date and barley prices in grams of silver per 1000 litres (log base 2 scale) per decade (299 = 299-290 BC)

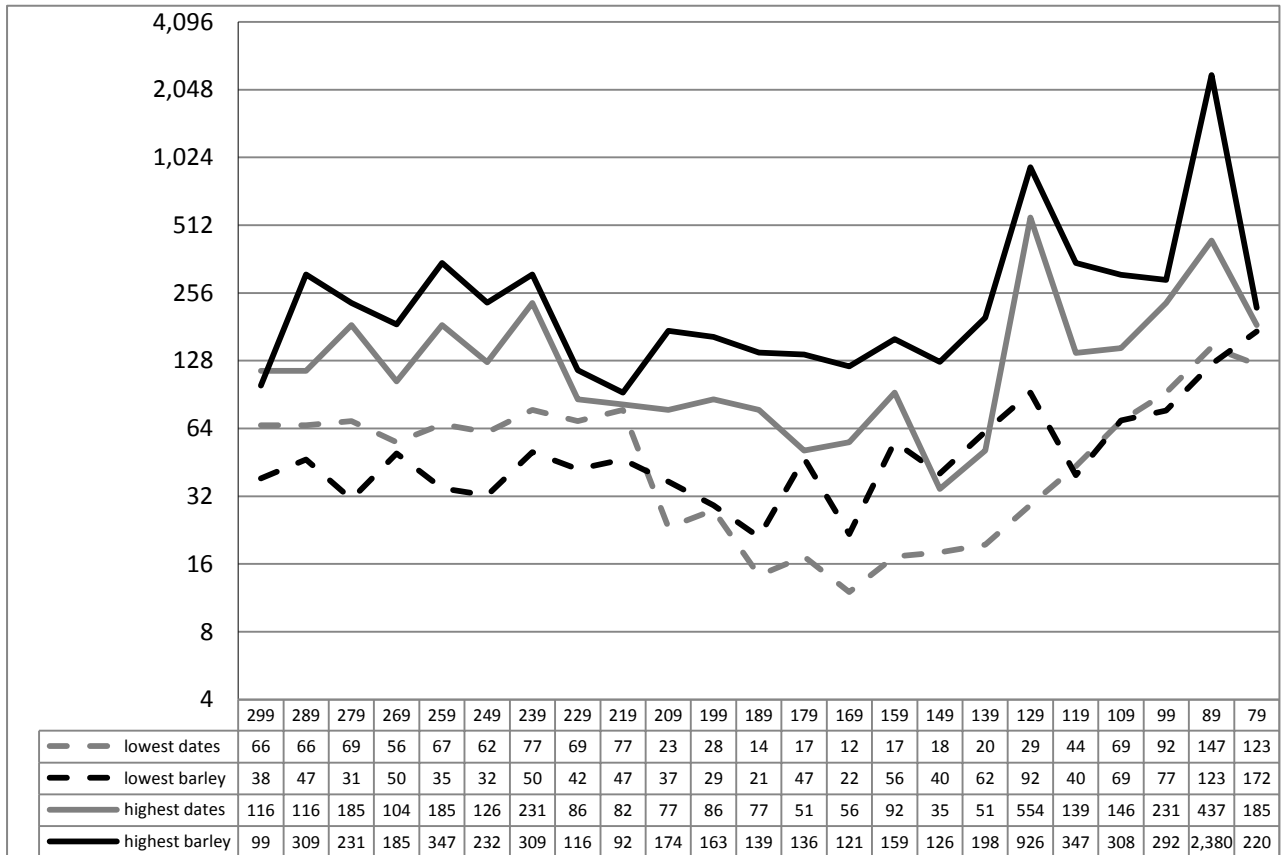


Fig. 3: Prices of barley and dates in grams of silver per ton

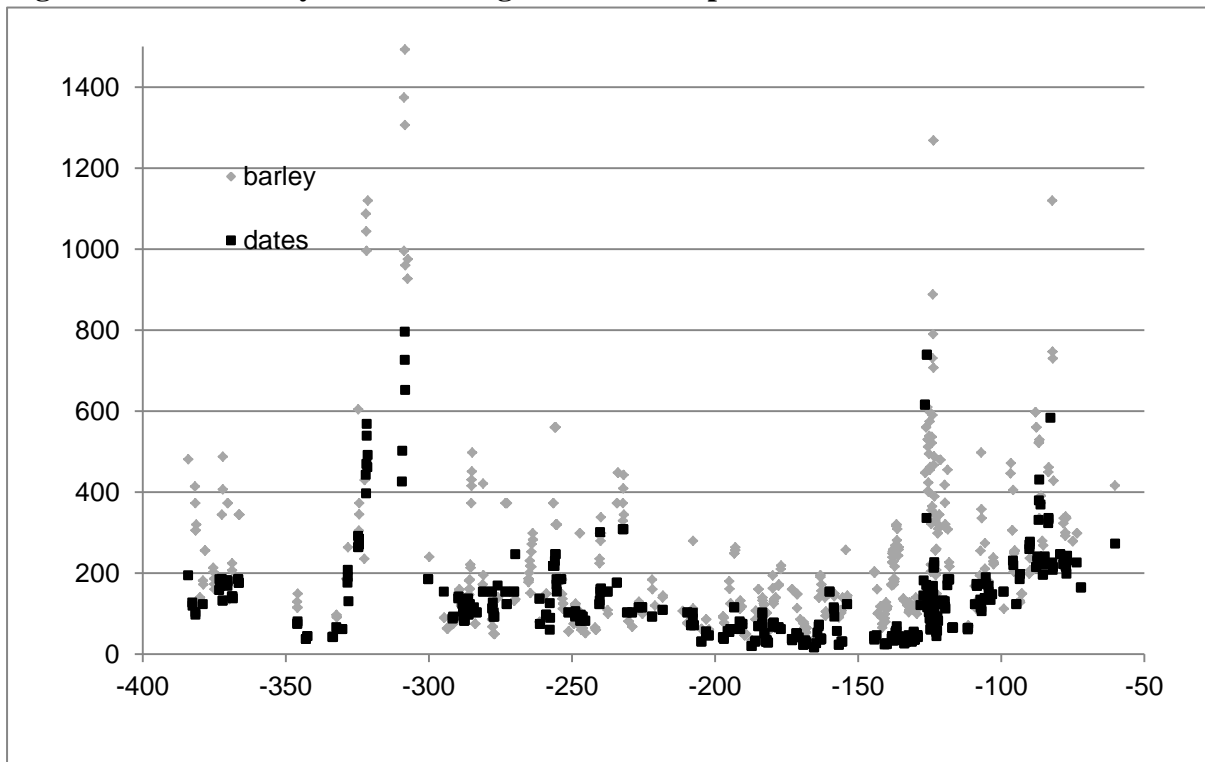


Fig. 4: Market performance and market efficiency over time

Market efficiency and market performance over time

Year	Netherlands Market performance	Netherlands Market efficiency	Middle East Market performance	Middle East Market efficiency
-300			0.64	-0.36
-100			0.45	-0.40
1500	0.29	-0.45	0.40	-0.47
1700	0.22	-0.63	0.30	
2000	0.06	-0.46	0.14	-0.36

Abbreviations:

ADART (or: Diary) = Sachs, A.J., Hunger, H. 1988, 1989, 1996, *Astronomical Diaries and Related Texts from Babylonia*. Vol. I. *Diaries from 652 B.C. to 262 B.C.*, Vol. II *Diaries from 261 B.C. to 165 B.C.*, Vol. III, *Diaries from 164 B.C. to 61 B.C.* Vienna: Verlag der Oesterreichischen Akademie der Wissenschaften.

CAD = The Assyrian Dictionary of the Oriental Institute of the University of Chicago.

CTMMA IV = *The Ebabbar temple archive and other texts from the fourth to the first millennium B.C.* Cuneiform Texts in the Metropolitan Museum of Art, Vol. IV. Edited by Ira Spar and Michael Jursa. New York: The Metropolitan Museum of Art; Winona Lake, Indiana: Eisenbrauns, inc. 2014.

SSA = *State Archives of Assyria*.

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