

1 | The Economy of Late Achaemenid and Seleucid Babylonia: State of the Problem, Methodology and Sources

Introduction

The division of this book into two key parts – structure and performance – takes its cue from a 1978 paper by Nobel laureate Douglass C. North, ‘Structure and Performance: The Task of Economic History’. The fact that the latter part clearly outweighs the former in this volume does not imply a postulated precedence of economic performance over structures as key determinant of an economy’s potential for growth or the welfare of a society. Nor should it be taken as indicative of a research strategy focussing on the quantification of data to the detriment of qualitative historical analysis. Rather, it reflects the state of sources for an economic history of Late Achaemenid and Seleucid Babylonia. On the one hand, we have at our disposal a remarkable series of commodity prices contained in a text genre known as the Astronomical Diaries, which allows for unmatched sophistication in the analysis of an ancient economy. On the other, the dearth of archival material from this period means that many aspects of the background to these prices can be elucidated only rudimentarily and by recourse to parallel situations both within and beyond the Seleucid Empire.

The Babylonian Astronomical Diaries (henceforth ADs, or diaries) are a set of cuneiform tablets recording a variety of observed celestial, climatic, ecological and economic phenomena, as well as giving accounts of historical events.¹ They comprise one of the largest collections of observational data available from the Ancient World, consisting of hundreds of tablets dating from c. 650 to 60.² The reason for taking the turn of the fifth to the fourth century as the starting point for our analysis is the increasing

¹ The Astronomical Diaries (ADs) have been published in several volumes by H. Hunger and A. Sachs (Astronomical Diaries and Related Texts = ADART). Relevant for this investigation are ADART I (1988), ADART II (1989) and ADART III (1996). The tablets from these volumes are quoted with the siglum ‘AD (astronomical year recorded)’. See Clancier 2009, especially 159–63, 169–72, 185–95 and 212–13 on the provenance of the diaries and their collection history in the British Museum.

² All dates are BCE unless otherwise specified. This interest in the collection of data, for the purpose of establishing an empirical basis for both astronomical and astrological prediction, differed markedly from Greek science, see Rochberg 2004: 147–51.

availability of price data after c. 400, as for the fifth century only three diary fragments containing prices are extant (and even fewer for the earlier years).³

The better part of the information contained in the Astronomical Diaries relates to astronomical observations, and in particular the position of the moon in the ecliptic during each night of a given (Babylonian lunar) month. However, the ADs are at the same time the single most important source for the political history of Late Achaemenid and Seleucid Babylonia. Among the historical accounts, the quite extensive report of the battle of Gaugamela and Alexander the Great's subsequent entry into the city of Babylon (Kuhrt 1990 and van der Spek 2003) has attracted particular attention, as has the description of preparatory measures preceding the First Syrian War between the Ptolemaic and the Seleucid Empires in 274/3 (see Will 1979²: 146–50). At this point, it has to be emphasised that the somewhat misleading term 'Astronomical Diaries' was coined in 1948 by their later editor, A. Sachs, who was mainly interested in the astronomical content of the tablets. The more neutral Babylonian designation was *našāru ša ginê*, meaning 'regular observation'.

Furthermore, with a total of more than 2,000 observations of the silver equivalents of six different commodities, among which are the staple foods barley and dates, the ADs together with a handful of Late Babylonian Commodity Price Lists provide us with one of the largest economic datasets for any pre-industrial society in world history.⁴ This wealth of material has not failed to elicit scientific interest, and two monographs as well as several shorter articles have already been dedicated to an analysis of the price equivalents of the ADs. The first systematic investigation of this price series was A. Slotsky's *The Bourse of Babylon* (1997a), which was followed in 2001 by *A History of Babylonian Prices in the First Millennium BC. I, Prices of Basic Commodities* by P. Vargyas. The former certainly chose a more innovative approach. A trained economist, Slotsky attempted a statistical examination of the long-term trends in the datasets of the individual commodities by means of a regression analysis. Vargyas on the other hand provided a discussion of both short-term and long-term fluctuations, but employed a much cruder methodology and restricted himself mainly to simple discussions of changes in the monthly equivalents and of centennial averages.

³ A synoptic overview of the available data on commodity prices from Babylonia during the fifth and fourth centuries is provided by Hackl and Pirngruber 2015: see 118–20 for the price data culled from the diaries -461, -453 and -418.

⁴ The Commodity Price Lists have been published by Slotsky and Wallenfels 2009; the texts are quoted with the siglum S/W (number of text).

However, both of these investigations have met with severe criticism. An important review of both studies by van der Spek and Mandemakers (2003) found fault in particular with the failure of both authors to convert the silver equivalents into genuine prices prior to analysis, which in both cases lead to several errors in the interpretation, and with their non-consideration of the impact of political history on commodity prices. An elaboration of the first point is provided in the above-mentioned review (especially 523–4 and 535–7), and we shall thus confine ourselves to a brief example. Between February and April 278, the equivalent of barley rose from 156 to 198 litres for 1 shekel of silver. This rise was in all probability caused by an improved supply situation as the barley harvest in Babylonia took place in April. The difference of 42 litres corresponds to a relative increase of 27 per cent in the equivalent; however, the decrease in the actual price (shekels per ton or *kurru* of barley) amounts to only 21 per cent.⁵ Hence, sticking to equivalents conveys a flawed idea of the magnitude of actual price increases or decreases. Furthermore, a conversion of the equivalents of the ADs into genuine prices will also facilitate comparisons with other historical periods, from Mesopotamia or other regions.⁶

It is thus the main aim of this book to add a historical perspective to the price data contained in the Astronomical Diaries and the Commodity Price Lists. Rather than providing a mere statistical description⁷ of the data, it will attempt to explain the general trends found in commodity prices as well as the deviations thereof. Particular attention will be paid to exogenous shocks, defined as historical events which had tangible repercussions in the price data. To be sure, there have already been first assessments of the impact of political history and ecological phenomena on the Babylonian commodity prices. Pertinent examples are several papers by van der Spek on the impact of warfare and royal policy (especially 2000), a study by Müller (1999/2000) on the influence of climate as visible in the changing river level of the Euphrates or a contribution by the present author on the detrimental effect

⁵ This principle emerges even more clearly by means of a fictitious example of a decrease in the equivalent from, say 60 to 30 litres per shekel, which is a halving (–50 per cent) of the equivalent but a doubling (+100 per cent) of the price. Also, note that as opposed to modern price quotations the Babylonian way of recording prices tends to emphasise particularly low prices in graphic representations, see Müller 1995/6: 164.

⁶ Throughout this book, shekels (8.33 grams) of silver per *kurru* (180 litres) of a given commodity have been chosen as price unit in order to facilitate comparison with the price data from the Neo-Babylonian period analysed by Jursa 2010, which is the most obvious reference point.

⁷ See the criticism of Slotsky 1997a by van der Spek and Mandemakers 2003: 523.

of locust invasions (Pirngruber 2014).⁸ The following analysis of the price data seeks to advance our knowledge of the impact of exogenous shocks by investigating in a systematic manner which types of events influenced commodity prices and to what extent in Late Achaemenid, Early Hellenistic and Seleucid Babylonia. Rather than discussing a single type of potential impact or one particular period only, and in order to avoid oversimplifying mono-causal attempts at explanation, we shall opt for a comprehensive approach and attempt to integrate as much information as possible. To this end, hitherto uncharted methodological territory in Ancient Near Eastern studies, namely regression analysis employing dummy variables, will be employed alongside a more traditional historical investigation of the price data in order to integrate historical events in a formal statistical model. This part of the analysis will thus allow us not only to trace developments in prices for basic goods during the Late Achaemenid and Seleucid periods, but also to see which types of exogenous shocks – comprising such different events as warfare on an imperial scale and more localised natural disasters – have an impact on commodity prices in Babylonia and to quantify them. Furthermore, it enables us to make qualified statements about the performance of the economy, which in this context can be succinctly defined as ‘the capability of markets to adapt to exogenous shocks.’⁹

Such an analysis of any group of commodity price data is, however, necessarily incomplete without due consideration of the general socio-economic and political fabric into which it is embedded: in short, the realm of what North famously called an economy’s institutional framework: ‘the underlying determinant of the long-run performance of economies.’¹⁰ In this section of the book, which will by logic precede the price analysis, the focus will be *inter alia* on the existing patterns of land tenure and storage practices: Not only do these two aspects fundamentally impact price formation, but the former in particular also sheds light on the close ties between

⁸ Other important articles dealing in one way or another with the price data include Vargyas 1997 and the response Slotsky 1997b; Zaccagnini 1997 (especially 375–7); Grainger 1999; van der Spek 2000a, 2006b and 2014; Temin 2002; Földvári and van Leeuwen 2011; van der Spek and van Leeuwen 2014; Huijs, Pirngruber and van Leeuwen 2015; van der Spek, Földvári and van Leeuwen 2015.

⁹ Van der Spek, van Leeuwen and van Zanden 2015b: 3.

¹⁰ The classic formulation is North 1990: 3: ‘Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction’; the quotation in the text: 107. A convenient fuller definition is provided by Menard and Shirley 2008: 1, according to whom institutions ‘include (i) written rules and agreements that govern contractual relations and corporate governance, (ii) constitutions, laws and rules that govern politics, government, finance, and society more broadly, and (iii) unwritten codes of conduct, norms of behavior, and beliefs.’

the political and the economic. Moreover, it brings us into the sphere of another key determinant of the efficiency of commodity markets, that of the factors of production – land, labour and capital – and the ways they are deployed by those who wield power over them.

By jointly analysing aspects of the structure and performance of the Babylonian economy in the Late Achaemenid and Seleucid periods, rather than by considering the price data of the *Astronomical Diaries* in isolation (as is the case in both Slotsky 1997a and Vargyas 2001), I hope to achieve a piece of genuine ‘economic history with economy’, to take up the challenge posed by Manning and Morris.¹¹

Structure of this Book

In what follows, recent trends in the debate concerning the nature of ancient economies will be discussed. In particular, the potential contribution of New Institutional Economics to shed new light on ancient economies will be pointed out. The remainder of this introductory chapter will then give a description of the sources drawn upon in this assessment of the structure and the performance of the Babylonian economy. Chapter 2 discusses the overall historical and socio-political framework into which the price data of the *Astronomical Diaries* is embedded. Emphasis will be laid on the question of continuities and breaks with the preceding and exceptionally well documented Neo-Babylonian and Early Achaemenid period. Chapter 3 then takes the above-average price volatility during the Late Achaemenid period as its point of departure. An analysis of the distribution of the main factors of production – land, labour and capital (assets) – sheds new light on the prevailing institutional framework that can be shown to be not at all conducive to economic stability or even growth. Chapter 4 tries to contextualise the Babylonian price records by analysing the extent of inter-annual storage (or carry-over) of the basic foodstuffs barley and dates in Hellenistic Babylon. Such an assessment of a strategy of risk aversion is particularly relevant for the question of price volatility.

Chapter 5 proceeds to a price history of Late Achaemenid and Seleucid Babylonia. This chapter is partly descriptive in that it traces the development of the prices of the various commodities over time. The basic characteristics of the dataset of prices, in the main the mean price and the average deviations thereof, are also discussed. The price data was organised according

¹¹ Morris and Manning 2005: 3.

to four different periods (Late Achaemenid, Early Hellenistic, Early and Late Seleucid), which each exhibit a different structural background. In addition to the descriptive part, each subchapter on the different historical periods also includes analytical sections. I have first sought to explain the overall movement of prices in terms of variations in the three major price-determining factors, namely supply, demand and amount of money in circulation. The historical background will be shown to have exerted a strong influence on the price data. I will pay due attention to outliers, hence particularly high or low prices, and their relationship to political history. Peak and trough prices visible in the graphs in this chapter are explained in the light of available historical information from the ADs and other sources. The Hellenistic period, for example, was characterised by continuous warfare within but also beyond Babylonia, and a high level of monetisation made possible by the capture of the treasures of the Achaemenid kings. It is thus not unexpected that prices during these three decades are significantly higher compared to the preceding and subsequent periods, a fact that needs to be duly accounted for in any assessment of the long-term development of prices in Babylonia. Also, in the section of this chapter headed 'The Late Achaemenid Period: The Issue of Price Volatility', which deals with the price data from the Late Achaemenid period, some basic comments on statistical description and the pitfalls encountered are made. Economic terminology that the historian may be unfamiliar with is briefly explained in the form of a glossary at the end of the book.

Chapter 6 then goes deeper into the issue of price developments under the impact of historical events. In the methodologically most innovative part of this book, a regression analysis was run on the Babylonian price data, with the information on political history modelled in the form of dummy variables. Two different approaches were pursued – one summarising the historical data in the form of political episodes, the other focusing on the basic factors underlying price oscillations – and their results compared, also to the findings of the preceding chapters. The repercussions of certain categories of historical events in the price data can thus also be shown in a formal way.

The brief conclusion will summarise the results obtained and consider the Late Achaemenid and Seleucid price data in a comparative context. I close this book with the question of conceptualising research on the ancient (or perhaps better pre-industrial) economies beyond the by now sterile debate between primitivists and substantivists versus modernists and formalists, and the fruitful integration of new theoretical approaches provided by recent research in Institutional Economics.

Prices, Markets and the Ancient Economy

The prices in the diaries, which will be at the centre of this investigation, are – typically for Mesopotamia – quoted as price equivalents, thus as amount of the commodity which can be purchased for one fixed unit of silver, namely 1 shekel (8.33 grams) of silver.¹² The commodities at issue are barley, dates, sesame, cress, cuscuta – a parasitical plant used mainly to season date beer in the first millennium – and wool, almost invariably in this sequence.¹³ The precise nature of these price notations has occasionally been questioned and the possibility of their treatment in economic terms doubted,¹⁴ but by now, it can be considered a given that we are dealing with historical prices, the formation of which is owed to market forces. To the impressive array of empirical arguments collected by van der Spek 2000a (295–6), one can add the econometric analyses of Temin 2002 and Földvári and van Leeuwen 2011, both confirming that the behaviour of these commodity prices, and in particular their unpredictable oscillations, is exactly as expected in a market situation. We would like to explicitly emphasise at this point that we consider the prices to be observed entities just like all other events recorded in the diaries (with the exception of a few predicted astronomical phenomena).

This occasionally voiced scepticism concerning the veracity, or rather even the reality, of the Babylonian price data is of course rooted in the debate on whether something like a ‘market’ – both as a physical entity and as an institutionalised process – actually existed in Ancient Babylonia. The starting point for this debate was an essay by the economist Karl Polanyi entitled ‘Marketless Trading in Hammurabi’s Time’ (1957). Polanyi distinguished between three forms of economic exchange, reciprocity, redistribution and the market. In his view, the latter played at best only a very marginal role in pre-industrial societies, where economic activities were strongly embedded in their social environment. His conceptualisation proved to be influential

¹² Slotskya 1997a: 8–11 provides numerous references to this particular manner of formulating commodity prices from the late third to the late first millennium.

¹³ See Slotsky 1997a: 23–42 for an extensive discussion of the commodities. Curiously enough, Slotsky and Wallenfels (2009: 13) cast doubt on the identifications of *kasû* with cuscuta, *sahlû* with cress and of *samaššammû* with sesame. However, they do not provide any kind of justification for their revisionist reasoning. Suffice it to briefly mention Bedigian 1985 and Stol 1983/4 and 1994 (all referred to in Slotsky 1997a) for the well-established and overall accepted interpretations of *sahlû* and *samaššammû*, only the identification of *kasû* with cuscuta (Stol 1994) is still occasionally doubted, e.g. by Geller 2000.

¹⁴ Zaccagnini 1997: 375–6, and Joannès 1997: 315.

in the field of Ancient Near Eastern studies, but also provoked a great deal of (justified) criticism.¹⁵

The antipode to Polanyi are scholars like M. Silver and D. Warburton, who apply concepts borrowed from modern, i.e. neo-classical, economics rather uncritically and often with a scarce command of the primary evidence – as was the case with Polanyi, too – to ancient societies (e.g. Silver 2004). This approach likewise results in a rather distorted portrait, subordinating livelihood to the rationality of an abstract *homo oeconomicus*, whose motivations and needs/wants are supposed not to have changed throughout the course of history.

In recent years, however, this unhelpful dichotomy between primitivism/substantivism versus modernism/formalism¹⁶ has increasingly been replaced by a different and more fruitful approach. It is, then, no coincidence that the name of Douglass C. North was already mentioned at the very beginning of this introductory chapter, as it is the strand of research associated chiefly with his name, the New Institutional Economics (NIE), that has started to gain a foothold in Ancient (Near Eastern) history. The towering monument attesting to this trend is the *Cambridge Economic History of the Greco-Roman World* (Scheidel, Morris and Saller 2007), which contains two sections dealing with the periods and regions under discussion in the present book. P. Bedford, in his chapter on the Achaemenid Near East,¹⁷ dedicates a significant amount of analysis to the legal framework within which economic activities took place, and the impact of the prevailing socio-political constellations. R. van der Spek's (2007) account of the Hellenistic Near East focuses *inter alia* on increasing monetisation of the Babylonian economy after the conquest of Alexander the Great, and the effect of Seleucid policies on the local economy.

Some of the latest works on aspects of the economy in the field of Ancient Near Eastern studies follow the above-mentioned research trend, albeit

¹⁵ Polanyi's writings have generated a vast literature, see, e.g., North 1977 and the contributions in Clancier, Joannès, Ruoillard and Tenu 2005. Veenhof 1972: 351–7 provides an early rebuttal of the theory of a marketless society on the basis of Old Assyrian material. For Polanyi's influence in the field of Ancient Near Eastern studies see succinctly van de Mieroop 1999: 116–18.

¹⁶ This debate is succinctly summarised from an Ancient Near Eastern perspective by van de Mieroop 1999: 108–23; see also Garfinkle 2012: 5–17 with a focus on the Ur III period in the late third millennium. A valuable take on current approaches to the economy of the Ancient Near East is found in Jursa 2010: 13–25. For the Mediterranean World see, e.g., Morris, Saller and Scheidel 2007; the essays collected in Scheidel and von Reden 2002 provide a convenient overview of research on the ancient economy from the 1980s and 1990s CE.

¹⁷ Bedford 2007. The pertinent data culled from cuneiform tablets from Babylonia plays an important role in his account, as the region is one of the better-documented areas of the Achaemenid Empire.

often without explicit reference to theory. S. Garfinkle (2012), for example, in his study of the archives of important merchant families from the Ur III state in the late third millennium, puts forward a striking criticism of the alleged dichotomy of private versus state economy. Instead of engaging in this (rather sterile) debate, he convincingly reinterprets these entrepreneurs to have been facilitators of different types of economic transactions, from money lending to commercialisation of agricultural produce to long-distance trade. Although they acted upon their own initiative, the state and its agents relied upon their activities to such an extent ‘that the efficient operation of the economy by the central administration of the Ur III state was dependent upon the existence of entrepreneurs whose activities were not controlled by the state.’¹⁸ This focus on an institution perceived as economically efficient is of course reminiscent of much NIE research, not least of North’s earlier work (e.g. North 1977; but see now Ogilvie 2007 for a critical assessment of this approach), and Garfinkle stresses this point in several passages of his concluding chapter. Moreover, he discusses the presence of features associated with market exchange such as competitive and profit-orientated actors in the peculiar setting, or institutional framework, of the Ur III period.¹⁹ In this regard, he follows the assessment of Wilcke, who characterises the economy of that time as a ‘System gewinnorientiert wirtschaftender Pfründen’, albeit one with strong redistributive elements (Wilcke 2007: 114). In the latter article, the motive of pursuit of profit is thus extended from merchants and other entrepreneurs to state officials, the holders of the allotments/prebends Wilcke refers to.

Closer to the period dealt with in the present book, and with a detailed discussion of the theoretical framework employed, is L. Graslin-Thomé’s (2009) monograph dedicated to long-distance exchange in the Ancient Near East in the first millennium. The influence of North is clearly discernible (and explicitly accounted for); a central part of the book is dedicated to the question of transaction costs, a key concept in the NIE.²⁰ On the one hand, she analyses the ways in which long-distance trade, especially during the Neo-Assyrian period, was facilitated by means of various measures taken by the state. Agreements between rulers – mainly the Neo-Assyrian king and the petty kings in the empire’s orbit – and the imposition of a

¹⁸ Garfinkle 2012: 137 and *passim*.

¹⁹ For example, Garfinkle 2012: 14 reiterates that ‘the presence of entrepreneurial households allowed for greater efficiency in managing the institutional economies.’ The competitive elements in the economy of the Ur III are acknowledged *ibid.*: 150.

²⁰ Graslin-Thomé 2009: 343–79; see also 120–3. On transaction costs see, e.g., North 1990: 27–35.

unified system of measures and weights within in the empire are discussed, as is the question of monetisation. On the other, state interventions to its own benefit but hampering mercantile activity (taxation, trade restrictions, monopolies, etc.) also receive due attention.

However, the question of the market as a ‘form of (economic) integration’, to use Karl Polanyi’s terminology, and in particular the performance of local commodity markets, is tackled only peripherally in all these contributions. The lone exception here who tackles the impressive amount of quantifiable data in the cuneiform documentation is Jursa 2010. This sweeping study of ‘economic geography, economic mentalities, agriculture, the use of money and the problem of economic growth’ (thus the book’s subtitle) of Babylonia in the long sixth century is based on a corpus of about 20,000 archival records both from institutional and private archives. Its results will be presented in more detail in the following chapter, as the transformation of economic structures in the period investigated by Jursa lingers on into the Late Achaemenid and Seleucid periods. Suffice it here to note that performance of the economy constitutes a key aspect in his treatment of the question of economic growth in Babylonia (Jursa 2010: 745–53 and 783–800, especially 793–4).

The overall focus on structure and almost complete neglect of performance in most treatments is all the more regrettable, as NIE provides scholarship with a helpful definition of the market, which makes this rather elusive concept, which too often is taken for granted, very amenable to historical research. In the definition of Furubotn and Richter, there are two crucial aspects of the market to consider. First, the market constitutes ‘a social arrangement to facilitate repeated exchange among a plurality of parties (as opposed to occasional exchange between individuals)’.²¹ This focus on concrete social contexts to transactions dispenses with the obstructive assumption of the unbounded (instrumental) rationality of the elusive *homo oeconomicus*²² and allows for the integration of differing economic mentalities into an economic order that may still exhibit – or even be determined by – market forces.

²¹ Furubotn and Richter 2005: 314. In the words of one economic historian of the Ancient World, ‘the market as an instituted process however (that is as learned behavior, as opposed to the abstract market of neo-classical economics) is a social construct that reflects the specific cultural settings in which it develops’ (Verboven 2014: 139)

²² In the definition of Black, Hashimzade and Myles 2009: 130 (s.v. economic man) the concept of the *homo oeconomicus* ‘achieves generality by placing no restrictions on the nature of preferences or on constraint upon choice’. The Weberian distinction between instrumental rationality (*Zweckrationalität*) and value rationality (*Wertrationalität*) is pertinent here, as any aspect of the latter, that is, ‘the conscious belief in the value for its own sake of some ethical, aesthetic, religious or other form of behavior, independently of its prospects of success’ (Weber 1978: 24–5), is absent in this definition. See on this point also (and more exhaustively) Bresson 2016: 9. Criticisms of the concept of a perfectly rational *homo oeconomicus* are found

Second, and this addendum is particular to the NIE, a market is also ‘an order or governance structure governing the transactions between individual actors.’ Consequently, a market is not simply an immutable given, but it is ‘produced’ by certain social actors.²³ Ogilvie elaborated one consequence of this interplay between the political and the economic in her brilliant analysis of the development of institutions. Rather than ascribing the rise and persistence of a given institution to its efficiency in responding to an economic need, she points to the role of distributional conflicts in shaping institutional frameworks and to a ‘rent-seeking agreement between political authorities and economic interest groups.’²⁴ In view of the generally close relationship between ownership of land and access to political power in pre-industrial agrarian societies, this aspect is particularly relevant when it comes to factor markets.

Hence, instead of uncritically accepting an alleged superiority of markets as ‘probably the most efficient means of distributing a limited number of goods’ (Warburton 2003: 361), the NIE approach invites us here to focus on the socio-economic configurations in the background. In particular, the manipulations of the institutional framework by major economic actors with the political potential to do so – in Babylonia, temples and crown as well as their protégés immediately spring to mind – to garner as big a slice of the economic pie as possible emerge more clearly. It is thus one important ramification of this approach that it enables us to focus on such interferences and disturbances of an economic system, which was shaped to a significant extent (as will be shown in greater detail below) by market forces, rather than downplaying the relevance of the latter.²⁵

Sources

For this investigation into the economy of Late Achaemenid and Seleucid Babylonia, both the Classical sources and the cuneiform evidence have been scoured for relevant facts. Before going *in medias res* it is therefore apposite

throughout a vast array of NIE literature, e.g., Furubotn and Richter 2005: 21; North 2005: 23–4; Menard and Shipley 2008; and Bresson 2016: 16–24.

²³ Furubotn and Richter 2005: 350.

²⁴ Ogilvie 2007: 664; note that the same concept of ‘rent-seeking elites’ looms large in North, Wallis and Weingast 2009.

²⁵ For example, Bedford 2007: 325: ‘Market transactions certainly took place, but it was not the exclusive means of exchange; indeed, it was arguably not the main form of exchange.’ Cf. Liverani 1988: 896, who was already aware of the greater relevance of a *mercato libero* compared to redistribution and similar mechanisms during the Neo-Babylonian and Achaemenid periods.

to briefly discuss the most fruitful sources. In the first place, obviously, the Astronomical Diaries have to be mentioned. Not only do they contain the bulk of the price data, their historical sections equally provide us with precious information on a wide variety of events that occurred in Babylonia in the second half of the first millennium. They are by far the richest source at our disposal, although often in a very fragmentary state, and constitute the backbone of any investigation into the history of Babylonia during the Late Achaemenid, Hellenistic and Seleucid and Parthian periods.²⁶ They often contain information that can be integrated with what is known from later texts written in different languages and from an outside perspective (e.g. the works of Greek and Roman historiographers), but in at least equal measure they record events that were hitherto unknown to historians. To give just one brief example, the local unrests occurring in and around Babylon during the 230s and in the late 140s are not known from other sources, but can reasonably be expected (and in fact will be shown) to influence the prices of the basic commodities. The present work has greatly benefited from the excellent *editio princeps* by Hunger and Sachs of the Astronomical Diaries (Hunger and Sachs 1988, 1989, 1996), without which this investigation could not have taken place in the present form. The commented edition of the historical sections of the ADs by Del Monte 1997 (which alas does not contain the diaries from the Late Achaemenid period) also deserves to be mentioned here.

As the diaries are at the very heart of this study, they shall be introduced in some detail and by means of a rather extensive example text, the reverse of AD -158B recording observations for month V of year 153 SE (July–August 159):²⁷

- 1 [...] ...
- 2 [... Night of the 12th, beginning of the night, the moon was] 2 cubits [in front of γ Capri]corni, [it stood] 1½ cubits behind Saturn
- 3 [... Night of the 13th, beginning of the night, the moon was] 2½ cubits [behind] δ Capricorni; the north wind blew. The 13th, moonset to moonrise: 10°.

²⁶ For their relevance as historical sources see, e.g., van der Spek 1993a and 1997/8. The historical sections of the ADs have been discussed in several articles on Late Babylonian history, see, e.g., van der Spek 1998a and 2003. The reconstruction of the political history of Late Achaemenid and Hellenistic Babylonia by Boiy 2004: 99–192 also draws heavily upon the information provided by the ADs. Del Monte 1997 provides an edition with minimal historical commentary on the historical passages from 331 – the account of Alexander the Great's conquest of Babylon – onwards.

²⁷ Hunger and Sachs 1996: 46–51 and plate 174.

- 4 [... sunrise to moonset: x]+1°, measured (despite) mist; the north wind blew. Night of the 15th, sunset to moonrise: 8°; the north wind blew.
- 5 [... Venus was] 1 cubit [above] α Virginis. [Around the 15th], Mercury's last appearance in the east in Leo; the north wind blew. Night of the 16th (and) the 16th, the north wind blew. Night of the 17th, the north wind blew;
- 6 [last part of the night, the moon was] 3½ cubits [in front] of η Piscium, the moon being 4½ cubits low to the south, ½ cubit below Mars, the moon being ½ cubit back to the west. The 17th, the north wind blew.
- 7 [Night of the 18th], the north wind blew; last part of the night, the moon was 5 cubits below β Arietis, the moon being ½ cubit back to the west. Night of the 19th (and) the 19th, the north wind blew. Night of the 20th, the north wind blew;
- 8 [last part of the night, the moon] was 4 cubits below η Tauri, the moon having passed a little to the east. The 20th, the north wind blew. Night of the 21st, the north wind blew; last part of the night, the moon was ½ cubit above α Tauri, the moon having passed ½ cubit to
- 9 the east. The 21st, the north wind blew. Night of the 22nd, the north wind blew; last part of the night, the moon was 1½ cubits below ζ Tauri. The 22nd, the north wind blew. Night of the 23rd, the north wind blew;
- 10 [last part of the] night, the moon was above γ Geminorum, the moon being ½ cubit back to the west, 1 cubit below Jupiter. The <23rd>, the north wind blew. Night of the 24th, the north wind blew; last part of the night, the moon was
- 11 4½ cubits below α Geminorum, the moon having passed ½ cubit to the east. The 24th, the north wind blew. Night of the 25th, the north wind blew; last part of the night, the moon was 1½ cubits in front of δ Cancri,
- 12 the moon being 1½ cubits high to the north. The 25th, the north wind blew. Night of the 26th, the north wind blew; last part of the night, the moon was 4 cubits below ε Leonis. The 26th, the north wind blew. Night of the 27th, the north wind blew;
- 13 last part of the night, the moon was 2 cubits behind α Leonis, the moon being 1 cubit high to the north. The 27th, moonrise to sunrise: 22°, measured. The north wind blew. Night of the 28th (and) the 28th, the north wind blew. Night of the 29th (and) the 29th, the north wind blew.
- 14 That month, the equivalent was: barley, in the beginning of the month, 2 pān 3 sūt, in the middle of the month 2 pān 4³ sūt 2³ qa, at the end of the month, 2 pān 4 sūt; dates, 2 pān 4 sūt; cuscuta, 3 kur;
- 15 cress, 5 sūt; sesame, 2 sūt 3 qa, at the end of the month 2 sūt 2 qa; wool, 3 minas. At that time, Jupiter was in Gemini;

- 16 Venus, until the middle of the month, was in Virgo, until the end of the month, in Libra; Mercury, in the beginning of the month, was in Cancer; around the 15th, Mercury's last appearance in the east in Leo; Saturn was in Capricorn;
- 17 Mars was in Pisces. That month, the river level receded 8 fingers, total: 30 was the *na* (gauge). That month, the satrap of Babylonia from Seleucia,
- 18 [which is on] the Tigris, entered Babylon. On the 9th day, merrymaking took place everywhere. The administrator of Esangil
- 19 [...] the *dudê* [gate] of Esangil opposite the Lamassu-rabi gate, the representative of the administrator of Esangil
- 20 [...] they went. On the 17th day, offerings at the entering of Madānu and the entering of Bēltiya of the gate [...]
- 21 [...] because of their injustices. The *nindabû*-offering did not take place. That month, [...]
- 22 [...] made ... On the 19th, the satrap of Babylonia Upper Edge went out [from Babylon] to Seleucia which is on the Tigris.
- 2 [Month VI,] (the 1st of which was identical with) the 30th (of the preceding month), sunset to moonset: 12^o, measured (despite) mist; it was high to the sun.

More than half of this report (lines 1–13) is dedicated to astronomical observations, with a clear focus on the position of the moon in the ecliptic and the positions of the planets, which are also summarised in lines 15–17.²⁸ Additionally, the diary contains references to the prevailing weather; the recurring utterance 'the north wind blew' (twenty-seven times!) conveys a good idea of the repetitiveness of some ADs.²⁹

Lines 14 and 15 contain then the observations of the price equivalents for the period in question. The Akkadian term for price equivalent is *mahīru*, usually written by means of the Sumerogram KI.LAM; the word derives from the verb *mahāru*, with the basic meaning 'to receive', 'to accept' (valuables, staples, etc.). Commodities are quoted in the diaries in the traditional capacity measures of *kurru* (180 litres), *pānu* (thirty-six litres), *sūtu* (six litres) and *qū* (one litre), except for wool, which is weighed in minas (a unit corresponding to half a kilogram). The sequence of the commodities seems to be at least partly dictated by their relevance in daily life, as barley and dates – the two mainstays of the Babylonian diet, counting for more than

²⁸ For more detailed descriptions of the contents of the Astronomical Diaries see Hunger and Sachs 1988: 11–38 and Hunger and Pingree 1999: 139–59 (with a strong focus on astronomy).

²⁹ The meteorological observations have been discussed in detail by Grafshoff 2010.

two-thirds of daily caloric intake (see Jursa 2010: 50) – are always listed first and price indications for these two goods tend to be more detailed. Indeed, AD -158B quotes two different prices for barley at the middle and the end of the month.

The fact that these prices are observed, rather than the results of actual transactions, may give rise to the question of their context and their representability. Regarding the former, the level of volatility clearly indicates that the prices recorded in the ADs were not administered by the temple, nor can they be considered as representing conversion rates internal to the temple economy.³⁰ The observations are, it has to be emphasised, genuine market prices, but we do not know whether the notations of the ADs were the prices the temple got for its disposable surplus in the city's commercial areas,³¹ which is the most attractive solution, or paid for its needs, or whether they stem from a randomly chosen merchant, or similar. The question of the representability of these prices seems to be less of a problem, as anthropological research shows that markets for basic foodstuffs in pre-industrial societies tend to exhibit a rather low level of dispersion.³²

The rationale for the inclusion of the price quotations in this text corpus has been discussed elsewhere in more detail (Pirngruber 2013), in response to a shortcoming addressed by Zaccagnini (1997: 375), namely the necessity to try and understand the price quotations of the diaries in their literary context. One needs to bear in mind that the ADs are a scientific text corpus, with a close relationship to both Babylonian divinatory culture and an emerging predictive science based on mathematical calculation, mainly applied to astronomical phenomena.³³ Two aspects emerge then more clearly. First, oscillations of commodity prices were an important subject in omen apodoses, just as were the two other main non-astronomical categories recorded in the ADs, meteorological phenomena and historical events. Second, just like the other phenomena recorded – the pattern of rainfall and the river level, as well as (to the Mesopotamian mind) history – prices

³⁰ See Jursa 2010: 587 for the stability of prices in temple-internal transactions during the long sixth century.

³¹ On market places (most prominently *sūqu*) in Babylonian cities see for now Jursa 2010: 641–4; a detailed investigation of the harbour area (*kāru*) in the city of Sippar is provided by Waerzeggers 2014: 75–93.

³² Fanselow 1990: 254. His research concerns twentieth-century CE Javanese markets, but the fundamental parameters apply also to first-millennium Babylonia, namely unbranded and loosely sold goods sold in frequent and similar small-scale purchases, setting a high number of precedents for a price.

³³ Pirngruber 2013: 206. The development of Babylonian and Assyrian scientific culture is the subject of the monograph Brown 2000. On the emergence of mathematical astronomy see most recently Ossendrijver 2015.

were considered as cyclical and hence possibly predictable events. Prices are thus an ideal category for the ADs: potentially legible against a divinatory background, they are equally a suitable test case for the emerging predictive science, which underlies the corpus of the Astronomical Diaries as a whole.

As observed for the astronomical phenomena (and as holds equally true for the river level or the historical sections), and in line with the development of Mesopotamian science, more than what is strictly needed for divinatory purposes is recorded. After all, in omen apodoses only the direction of the price movement – upward or downward – rather than the exact extent of the oscillation in litres is recorded as the consequence of the birth of an *izbu* (a miscarriage), a stellar constellation, or otherwise. An example from the collection *šumma izbu* (tablet V, line 79) reads in the translation of its editor (Leichty 1970: 78): ‘If a ewe gives birth to a lion and its face is covered with fatty tissue – trade values (KI.LAM/*mahīru*) will fall.’³⁴ An omen from *Enūma Anu Enlil* reads: ‘If an eclipse occurs on the 15th day and it (the god) disappears while it is in the eclipse, and a meteor falls: Flood will devastate the land. The economy (KI.LAM/ *mahīru*) of the land will diminish.’³⁵

One should furthermore note briefly that the economic interest in divinatory texts goes beyond the mere registrations of increases and decreases of the *mahīru*. For example, references to the harvest outcome of specific commodities – usually those of the diaries – are found, which in turn can be interpreted as having influenced the price equivalent. One pertinent instance reads: ‘If Adad thunders, sesame and dates will not flourish.’³⁶ Instead of mentioning the outcome of specific commodities, the threat of a general harvest failure facing the country is encountered: ‘If an eclipse occurs in *nisannu* in the middle watch, the harvest of the land will not thrive, var., there will be famine’ (*Enūma Anu Enlil* 17 § I 2, Rochberg 1988: 123).

After the summary of planetary positions, the diary continues with a short remark on the level of the Euphrates, which had receded in the current month. The typical pattern is that of a peak level in spring, after the snowmelt in the Anatolian mountain region, the main source of water of

³⁴ The most recent edition is De Zorzi 2014 II: 479. Note that there are several ways of translating *mahīru* (KI.LAM), cf. CAD M I, s.v. *mahīru*: 92–8. For the omen apodoses, translators vary between meanings 2 (business activity or the economy in general) and 3 (price equivalents). As in any case falling equivalents (i.e., rising prices) can be interpreted as manifestations of a dwindling economy, either translation amounts to the same outcome. However, a translation as ‘price equivalents’ in these passages is more accurate in my opinion.

³⁵ Tablet 21, § I 2; translation Rochberg 1988: 233.

³⁶ *Enūma Anu Enlil* tablet 22 II §IV 2; translation Rochberg 1988: 264.

the Euphrates, and a trough in the arid summer months, before local rainfall ameliorates the situation.³⁷

The diary given as example closes with a brief historical passage, which relates a visit from the satrap from his residence in the provincial capital Seleucia-on-the-Tigris to Babylon for a sojourn of ten days. During that time, he performed some sacrifices together with local dignitaries such as the *šatammu*, the ‘temple administrator’, or ‘bishop’ in earlier literature. There seem to have been some irregularities, the nature of which cannot be specified due to a lacuna on the tablet – alas, another quite common occurrence with the tablets of the Astronomical Diaries. It has already been noted by the editors that these historical notes are centred very much on the city of Babylon (Hunger and Sachs 1988: 36). For the purpose of the present study, however, this is all the more valuable as an immediate context for the price data is provided.

A second important category of cuneiform texts, and in some way related to the ADs, is the series of Babylonian chronicles from the Hellenistic period, Babylonian Chronicles of the Hellenistic Period (BCHP), published online at www.livius.org/babylonia.html.³⁸ These texts bear great similarity to the historical sections of the ADs as regards terminology and composition and likewise give valuable insight into the political vicissitudes of Seleucid Babylonia. With one exception in the so-called Chronicle of the Successors or Diadochi Chronicle (BCHP 3 = ABC 10), which records the long-lasting conflict between various Greek generals in the aftermath of Alexander the Great’s death in 323, these texts do not provide us with price observations. Also this text group extends into the Parthian period, although the majority of them date to the third century, with a notable peak in the crown prince-ship of Antiochus I in the 280s. The most intriguing of these chronicles, however, describes the Ptolemaic invasion of Babylonia in the course of the Third Syrian War in winter 246/5 – an event not mentioned by the (extant) Classical sources.³⁹

In a similar fashion, the works of Greek and Roman authors also focus strongly on political history. The most fruitful work for our purposes is the

³⁷ Brown 2002 and Huijs, Pirngruber and van Leeuwen 2015:135–7 and fig. 7.7.

³⁸ Last accessed 1 June 2015. See also the extensive textual commentary provided on this homepage. Also Grayson 1975 and Glassner 2004 contain several of the Hellenistic chronicles. However, in recent years important new texts such as BCHP 14, describing the establishment of a Greek colony under a king Antiochus, have come to light, which are not included in these earlier editions. On the relationship between chronicles and diaries see most recently Waerzeggers 2012: 297–8 and Pirngruber 2013: 200–1.

³⁹ The text is preliminarily published as BCHP 11 = Ptolemy III Chronicle at livius.org. See also Clancier 2012a.

Bibliotheca historica by Diodorus of Sicily. Of particular relevance are his books XIV to XVI on Late Achaemenid history, book XVII on Alexander the Great and books XVIII and XIX on the history of the Successors, with many events taking place in Babylonia. The later books are preserved only very fragmentarily, but still contain occasionally interesting information.

The best-documented period in absolute terms is certainly that of Alexander the Great, whose feats elicited already in antiquity a wealth of literature such as Arrian's *Anabasis (Alexandri)* and the *Historiae Alexandri Magni* of Q. Curtius Rufus. Of course, the results of modern scholarship also need to be duly considered in any attempt to reconstruct the impact of political history on prices, especially as regards controversial subjects. A good case in point is the notoriously uncertain chronology of events during the period of warfare between the diadochi in the aftermath of Alexander the Great's death in June 323.⁴⁰

Important reference works for the contextualisation of price data and historical information contained in the primary sources include Will 1979² and 1982²; Bosworth 1988; Green 1990; Briant 1996; Boiy 2004; and Grainger 2010.⁴¹

As regards the socio-economic background to the price data, the sources at our disposal are notoriously meagre. For Babylonia, and northern Babylonia in particular, 484, the second year of Xerxes, was an important watershed: the successful suppression of the rebellions of Šamaš-eriba and Bēl-šimānni was followed by some sort of punitive measures against the northern Babylonian urban elites supportive of the revolts. One consequence was the so-called 'end of archives', the widespread disruption of documentary evidence in the cities involved, among which we count such important places as Borsippa, Sippar (including the large temple archive of the Ebabbar) and of course the city of Babylon itself.⁴²

From the fifth and fourth centuries, there are at least four larger archives providing important information on administrative practice and thus providing context for the price data of the diaries. The Kasr archive documenting the business activities of the Achaemenid satrap Bēlšunu (Xenophon's Belesys) and the Esangila archive from the city of Babylon, as well as the

⁴⁰ Boiy 2000 and *passim*. Boiy 2007a provides an exhaustive discussion of the problems, as well as a convincing proposal for a solution.

⁴¹ For the early Hellenistic period see also Schober 1981 (with a focus on Babylonia) and Anson 2014. Furthermore, the monographs Bikerman 1938; Sherwin-White and Kuhrt 1993; Capdetrey 2007; and Kosmin 2014a on various aspects of the Seleucid Empire deserve mention here.

⁴² Waerzeggers 2003/4; Kessler 2004; and Baker 2008; the longer-term economic consequences of this event are discussed by Jursa 2014a; see also Pirngruber forthcoming A and B.

Brewers' archive and the Tattannu archive from Borsippa. Unfortunately, as of yet these archives have not been adequately published.⁴³ These texts are relevant in so far as they give us insights into economic transactions and administrative practices of the temple households (of the Esangila in Babylon and the Ezida in Borsippa) and hence shed light on the prevailing economic structures within which of the prices recorded in the ADs need to be considered.

Finally, the Murašû archive, with some 800 texts the largest archive of the Late Achaemenid period, dates to the last quarter or so of the fifth century and hence predates the price documentation of the ADs.⁴⁴ Furthermore, it stems from the southern city of Nippur, which is usually thought to constitute a less integrated rural area on the fringes of the Babylonian plain (see Jursa 2010: 405–4, for the comparative marginality of the region). However, this archive is of crucial importance in elucidating the patterns of land tenure in Late Achaemenid Babylonia, and the social structure as reflected in this archive seems to be generalisable for the whole region and period.

This archival material will be employed above all in our analysis of the structural background to the Late Achaemenid and Seleucid economy, in an attempt to integrate the price data from the ADs and Commodity Price Lists with administrative records from the ambiance of the temple and with legal documents and records from private archives. Unfortunately, this material is by no means comparable – in terms of both density and variety of aspects covered – to the documentation of the 'long sixth century' so profitably analysed by Jursa and others.⁴⁵ Not only is the outlook of the present

⁴³ See Jursa 2005a: 73–76 and 94–97. As regards the Esangila and Brewers' archives, the text copies in CT 49 (for which see also the important review, Oelsner 1971) constituted the bulk of published material upon which this study could draw. Additionally, several scattered text publications (Stolper 1993a; Jursa 1997 and 2002; Kessler 2000) can be added. This corpus of Late Achaemenid and Hellenistic archival texts from northern Babylonia stemming from an institutional, i.e. temple, background has now been significantly expanded by Hackl 2013, who also provides an exhaustive study of their diplomatics. CT 49 contains among other tablets also material from the smaller private archives of Murānu (third century) and Rahimesu (early first century), which are closely connected to the realm of the Esangila temple. These archives were discussed by Jursa 2006 and van der Spek 1998b, respectively. The Kasr archive is currently being studied by Andrew Dix (Chicago); tablets of this private archive of a high official have been the focus of several publications by Stolper (1987, 1995, 2004 and 2007). On the Tattannu archive see preliminarily Jursa and Stolper 2007.

⁴⁴ The archive has been the subject of the influential study Stolper 1985, see also van Driel 1989 and 2002, esp. 194–273 and Pirngruber forthcoming A.

⁴⁵ See especially Jursa 2010. Other important contributions include Jursa 1995, 2004a and b, 2005b, 2008 and 2009; Wunsch 2000; van Driel 2002; Waerzeggers 2003/4 and 2010; Baker and Jursa 2005; Janković 2008 and 2013; Kleber 2008. Jursa 2005a provides a succinct overview of the archival sources from first-millennium Babylonia.

work thus necessarily different because of the diverseness of the underlying source material, but the lack of pertinent information also means that fundamental parameters of the economy of Hellenistic Babylonia have to remain somewhat elusive. It hardly comes as a surprise, then, that investigations concerned with the structural background to the price data that have been undertaken so far, have taken a deductive approach informed by economic theory. Prominent questions include the level of market integration and trade in basic commodities within and beyond Babylonia (van der Spek and van Leeuwen 2014 and van der Spek 2014b) and developments in the level of monetisation and its impact on prices (van der Spek, Földvári and van Leeuwen 2015).

For further preliminary remarks, I refer the reader to the introductory sections to each chapter. The next chapter provides a brief introduction to Late Achaemenid and Seleucid Babylonia and elucidates the economic background of the prices recorded in the diaries