The speed of coin diffusion within Seleucid Empire and the EU compared

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Abstract

Since 2002 most countries of the EU have a common currency, the Euro. This is the culmination of the free movement of capital across borders, one of the aspects of the creation of a single market within the EU. With this achievement, however, we tend to forget that many regions in the past had comparable forms of common currencies. In order to assess the uniqueness of the EU achievement, we compare its speed of coin circulation, being an indicator of the efficiency of its internal market, with that of the Seleucid Empire over 2,000 years ago. We find that Seleucid silver coins circulated at about the same speed as do the Euro coins today. This is not true, however, for Seleucid bronze coins, which had a far slower speed of circulation. Given the monetary differences between the EU and the Seleucid Empire, a direct comparison of the proximate causes for this pattern is impossible. Yet, looking at the ultimate factors (i.e. geography and institutions), we find that geography did not play a major role in both region. Given that the speed of circulation was the same anyway, this implies that the effect of the underlying institutions must have been comparable as well.

1. Introduction

The free movement of goods, services, persons and capital, also termed the "four freedoms", are fundamental characteristics of any common market. In order to achieve these four freedoms, many treatises have been set up dealing with the abolition of customs duties, egalitarian taxation, freedom of movement of labour, etc. Yet, until the formal establishment of the Economic and Monetary Union (EMU) in 1998, which eventually led to the common currency, the Euro, in 2002, progress in terms of the freedom of capital was slow.

These events were indeed turning points in the capital and monetary history of Europe, but the processes leading to these turning points started much earlier. It was already in 1929 that the German politician, Gustav Stresemann, argued at the 10th session of meeting of the League of Nations (the predecessor of the United Nations) in favor of a European common currency after World War I (League of Nations 1929, p. 70). Cut short by the economic crisis and World War II, the plan laid forgotten until an initiative of the European Commission in 1969 led to a plan to arrive at an economic and monetary union by the end of the 1970s. Yet, the collapse of the Bretton Woods system and the oil crises prevented this plan to come to fruition. The idea was re-launched when in 1988 the President of the European Commission, Jacques Delors, and the heads of the 12 European Central Banks were asked to set up a timetable for arriving at a Monetary Union, which eventually succeeded in 1998.

Looking at this long and difficult process in establishing such a monetary union, we sometimes forget that this development within the EU was by no means unique. Not only the EU but many empires in the history, deliberately or not, attempted to achieve a monetary integration. For large stretches of time, large parts of the world used a widely exchangeable currency. One of the earliest examples of monetary integration is the Seleucid Empire, which existed in the Middle East from the time that Alexander the Great defeated the Persian Empire and got his name from the Seleucid dynasty that succeeded Alexander in the Middle East. To a large degree this Empire, spanning from c. 312/11 to the first quarter of the first century BC, present optimal conditions for comparison with the EU model, since it was characterized by common silver and bronze currencies and covered many areas with relatively high level of economic development. The question what drives the speed of circulation in both regions is difficult to answer, but it definitely includes factors like taxation and inter-regional commerce. Obviously, coins were only partially the means of payment within the Seleucid Empire (e.g. de Callataÿ 2006)[1], let alone within the EU where digital money took over the vast share of money transfers. Also the role played by coins then and now is different; nevertheless they are good markers of the movement of goods and individuals, even today. Any comparison between economies divided by two and half millennia is a difficult task due to fundamental differences in technology, consumption and institutions. Yet it is not impossible, as attested by a wide range of studies that adopts the modernist view on ancient economies. All patterns we observe at the level of economy are fundamentally aggregates of individual behavior and in this sense our ancestors were more alike us than some influential 20th century historians (especially Karl Polanyi and Moses Finley) were willing to believe. Such a specialization necessitates goods exchange, so gives trade rise to coinage and the flow of coins, and the core area of what become the Seleucid Empire, i. e. Babylonia, had already achieved a high level of monetization by the 6 century BCE as argued by Jursa (2014) (see Iossif in this volume for a low estimation of monetization for the Seleucid and Ptolemaic economies).

The question that thus springs to mind is how "special" the EMU is in a historical perspective. Since the speed of coin diffusion is an important measure of the integration in the common market, in this paper we will use this measure to assess the difference between the monetary union within the EU and the Seleucid internal market over 2,000 years ago. In the next Section we discuss the data, while Section 3 deals with the speed of diffusion and reaches the conclusion that for interregional coin diffusion the picture of the Seleucid Empire 2,000 years ago and the EU today is not so different after all. In section 4 we estimate the effect of distance on coin diffusion and find its effect to be negligible in both regions and periods. Section 5 summarizes the main results.

2. Data

Before dealing with the data, it is important to clarify what the speed of coin diffusion actually is. In this paper we follow Hek et al. (2002) in calculating a type of diffusion coefficient based on two situations: a coin is either "domestic" or "foreign". Assume two countries: one is labelled as domestic the other as foreign. Initially, the domestic country has only domestic coins, i.e. 100% of the coins in that country will be local. The next year, some of its coins will travel abroad while some foreign coins enter the country, slightly reducing the share of domestic coins in circulation. In the second year again some coins will travel abroad while others will enter the country, further reducing the share of domestic coins. Hence, coin diffusion is defined as the decrease in the share of domestic coins over time. Of course, there is a chance that domestic coins reenter the domestic circulation and foreign

[1] For an alternative point of view see Aperghis (2004) who argues for a highly (contested) monetized Seleucid economy.

coins leave the domestic country. The process outlined above settles in an equilibrium when the number of coins leaving the domestic country equals those that arrive from outside. In a perfectly integrated market, in the long-run one expects the coin distributions to reflect the relative size of the markets of the two economies and their coin productions. This implies there is a scale effect. If, for example, we have a country with 60% and another with 40% of the total annual coin production, in case of a free movement of coins, we should observe a decrease of domestic coins from 100% to 60% and 100% to 40% respectively in the long-run. This implies that the second country may appear to have a faster speed of diffusion. For this reason it is important to compare geographical regions of coin production that have a roughly equal share in produced coins.

Within the Seleucid Empire we distinguish the regions of coin production into Mesopotamia & Media, the Levant and Syria, Bactria, Armenia, Greece, Asia Minor, and the Upper Satrapies. Especially Mesopotamia & Media and the Levant & Syria had a high coin production. Yet, assuming a free movement of coins in the long–run, the average share of domestic coins (both silver and copper) should converge to around 30% (see following Section). This implies that for the EU we should also select a region that produces ca. 30% of the total euro coins. Data from the EU is available from the volunteer project "eurodiffusion" (http://www.eurodiffusie.nl/). This website monitors for every month the coins in possession of the participants of the project. In theory the whole of the EU is covered, but in practice only a few countries are properly covered, most notably the Netherlands, Flanders (Belgium is mentioned in the dataset, but almost all reporters are from Flanders),

Table 1. Cumulative coin production in the EU

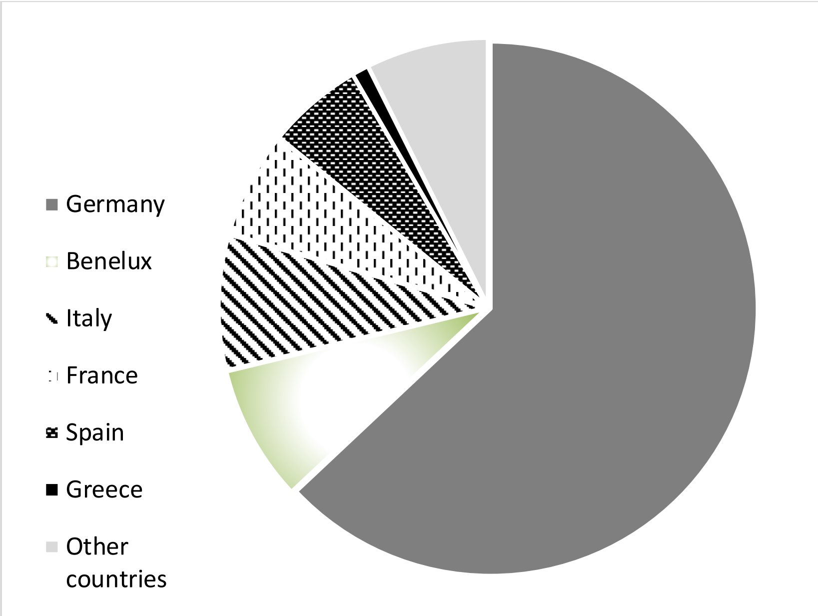
	Germany	Spain	France	Italy	Austria	Other countries
2002	31.1%	14.7%	15.2%	14.6%	3.9%	20.5%
2003	31.5%	14.2%	15.4%	15.4%	3.7%	19.8%
2004	31.1%	15.3%	14.8%	13.6%	4.2%	20.9%
2005	31.2%	16.2%	14.4%	13.3%	4.3%	20.6%
2006	30.7%	16.8%	14.4%	13.3%	4.3%	20.5%
2007	30.4%	16.9%	14.3%	13.0%	4.5%	20.8%
2008	29.9%	16.9%	14.7%	12.9%	4.6%	21.0%
2009	29.6%	16.9%	15.1%	12.7%	4.8%	20.9%
2010	29.5%	16.8%	15.4%	12.8%	5.0%	20.5%
2011	29.5%	16.7%	15.5%	12.8%	5.2%	20.3%
2012	29.6%	16.5%	15.7%	12.8%	5.4%	20.0%

Source: European Central Bank (http://www.ecb.europa.eu/stats/euro/production/html/index.en.html) and personal correspondence.

and Germany. The cumulative coins produced for countries with 5% or more share within the EU is given in Table 1 and shows that only Germany comes close to this number. This is also found by Seitz et al. (2012) who predict in the long run a share of domestic coins in Germany of around 47%. Hence, in the following we will use Germany to represent EU speed of diffusion.

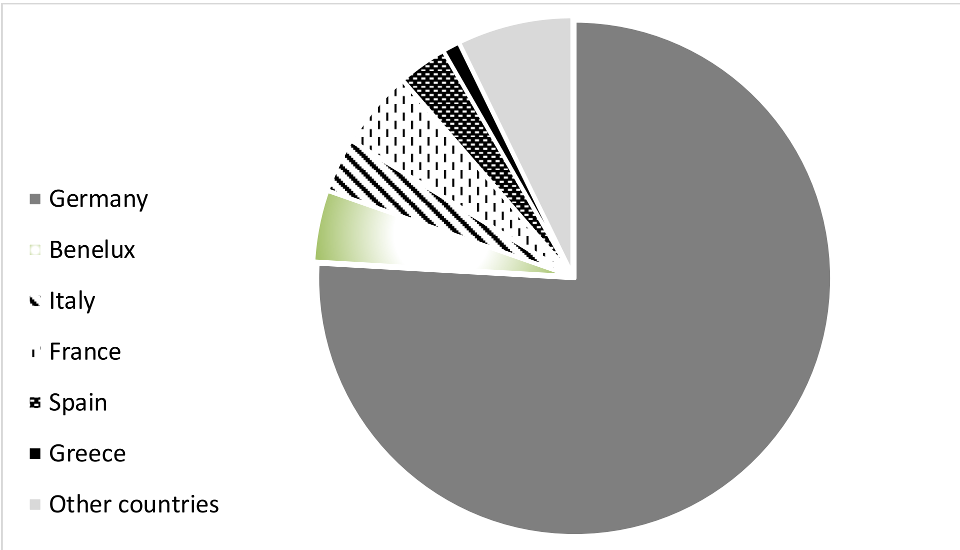
Since the sample size of coins for each month for Germany is 765, one might argue the estimated share of domestic coins is within 3.5 percentage point with 95% confidence.[2] It is also possible to use the Bundesbank's own report for a crosscheck: in 2012 the Bundesbank asked 30 of its sub-branches for samples of 2,000 coins of 20 cents and higher. In Figures 1 and 2 we

Figure 1. Coin share as calculated by the Bundesbank for 2012 for coins 20 cents and higher



Source: Deutsche Bundesbank (2013)

Figure 2. Coin share as calculated by the eurodiffusion project for August 2012



Source: http://www.eurodiffusie.nl/

[2] The uncertainty will be the highest when the estimated share of domestic coins is at 50%, when the confidence interval is ±3.5%. As our estimate of the share approaches either 0 or 1, the effect of sampling error reduces converges to zero.

report the coin shares by country of origin from the Bundesbank and the eurodiffusion project respectively. The patterns of coin distribution are relatively similar with the main difference being that the share of domestic German coins is a bit higher within the eurodiffusion project. Yet, since the eurodiffusion project reports these values consistently for every month in 2012, we are inclined to attach more value to these estimates.

Having comparable sizes of the share of domestic coins, answering the question how many foreign coins entered the market after a few years would give us an estimate of the speed of coin diffusion. However, there are two problems with the German data. First, the number of coins in circulation increased from 115.5 billion to 222.5 billion between 2002 and 2012, i.e. an increase of 93%. This means that, since German coins were issued also after 2002 in Germany, a slight underestimate of the speed of diffusion will take place. Second, it is likely that the share of coins issued by each country changes over time. Even though the distribution of values remains roughly identical over time, such is not the case for the number of coins. Especially countries like the Netherlands and Finland, which abolished the use of coins of 1 and 2 euro cent, have a lower number of coins in circulation that countries that still produce them like Austria, Ireland and Greece with Germany being somewhere in the middle. This in turn results in an increase in the speed of diffusion as calculated by the decline in share of domestic coins after one year. Since both effects are very small and, in addition, cancel each other out, we will ignore this from here on.

Contrary to the German data, the data for the Seleucid Empire are less straightforward since they are based on coin finds. We use the data from Iossif (forthcoming) from the SHD dataset on coin hoards and the SED dataset on excavation data. It is important to stress the difference between both datasets. The former looks at coins buried together on purpose, while in the latter stray, often unrelated, finds are reported coming either from organized excavations (with archaeological context considered) or from excavations and stray finds combined (where, in most of the cases, it is impossible to reconstitute the original context of the finds). It thus remains the question how reliable the excavation data are for this analysis. In addition, the excavation database only has information on 15 silver tetradrachms and, hence, cannot be used for analyzing the spread of silver coins.

Therefore, we are left with three samples: on bronze coins from both the SED and SHD databases and for silver for the SHD dataset. The results are reported in Table 2. As one

Table 2. Summary statistics: number of coins in the Seleucid Empire

coin	Cases	total	mean (per case)	st. dev.	min	Max
bronze (SED)	845	7,778	9.2	73.1	1	1936
silver (SHD)	1,286	7,174	5.58	34.2	1	1160
bronze (SHD)	124	1,279	10.3	35.7	1	299

can see in column 2, we have in total 2,255 observations where information on both the region of minting and burial are available. Of these 2,255, 845 cases are for bronze coins in excavations, 124 cases for bronze coins in hoards, and the remaining 1,286 cases are available for silver coins (i.e. drachms and tetradrachms alike but with a strong predominance of the latter, higher denomination)[3] in hoards.

The Seleucid data, however, has two main problems. First, the distribution of coins is by no means representative of the composition of the money stock. In case of hoarding, high value coins are preferred as they are easier to carry and hide and because silver represented a higher monetary value as compared to the largely fiduciary bronze denominations. This may also explain the relatively low number of silver coins found in the excavations database. Furthermore, bronze coinages were mostly confined to an area around the mint of production (e.g. Meadows 2014). Yet, even though it is thus difficult to compare silver and bronze coinage, we can make the less restrictive assumption that the number and geographical distribution of either silver or bronze coins in our sample is representative of the population distribution. We can identify whether a coin was buried in the same province where it was minted (labelled as “domestic” coin) or if it arrived from a different province (called “foreign” coin).

Second, the observed number of coins in the Seleucid data have extreme ranges due to two dominant observations (1,936 and 1,160 coins in a single find respectively), which results in high standard deviations in Table 2. This can be solved by either taking the unweighted average of all hoards (i.e. meaning that large finds have a similar weight as small finds), or weighted (i.e. the big finds have a much higher weight). Since both methods have their advantages and disadvantages we will provide both methods in the analyses below.

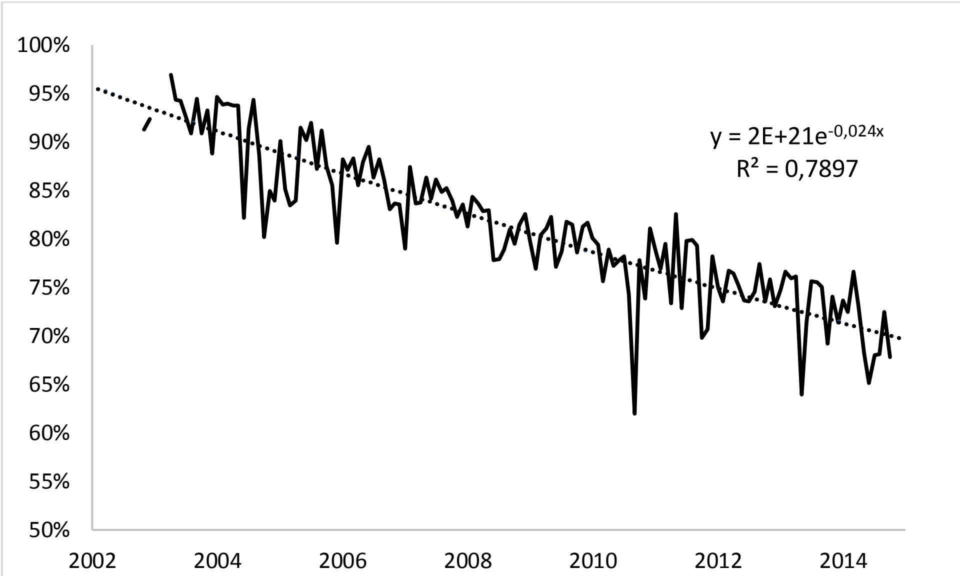
3. The speed of coin diffusion

Calculating the speed of diffusion of EU coinage to and from Germany is straightforward since we have direct observations about the share of domestic coins in the Germany on a monthly basis between January 2002 and the present. Because the data are very detailed, we had to make an additional restriction, which are also common in the literature. First, we do not distinguish among different denominations. This assumption is the same as for the Seleucid Empire. Even though in the Seleucid data we do distinguish between silver and copper coins, we do not make any further distinction in different types of copper or silver.

The general trend is as expected (Figure 3). The share of foreign coins in Germany started out at 100% when the euro coins were introduced in circulation but dropped quickly to 92% in January implying a considerable coin exchange among EMU countries during the first weeks. The diffusion process seems to follow an exponential trend, with the share of domestic coins decreasing by 0.24 percentage per month, (2.8 percentage after the first year, and 25% by the end of the 10th year).

[3] cf. Iossif (forthcoming)

Figure 3. Share of German coins in Germany



Source: http://www.eurodiffusie.nl/

The question is how to compare this dataset to the Seleucid Empire since we have only hoard and excavation data with varying minting and burial dates (see Map 1 and 2). An obvious way to reconstruct the diffusion process of the coins is to use their ratio as an estimator of the share of domestic coins in circulation. First, we divide the data into classes by the time differential between minting-burial and observe the number of foreign and domestic coins per class (n_k^f and n_k^d respectively, where k denotes the kth class, *f* and *d* are for foreign and domestic). The share of domestic coins in circulation is hence:

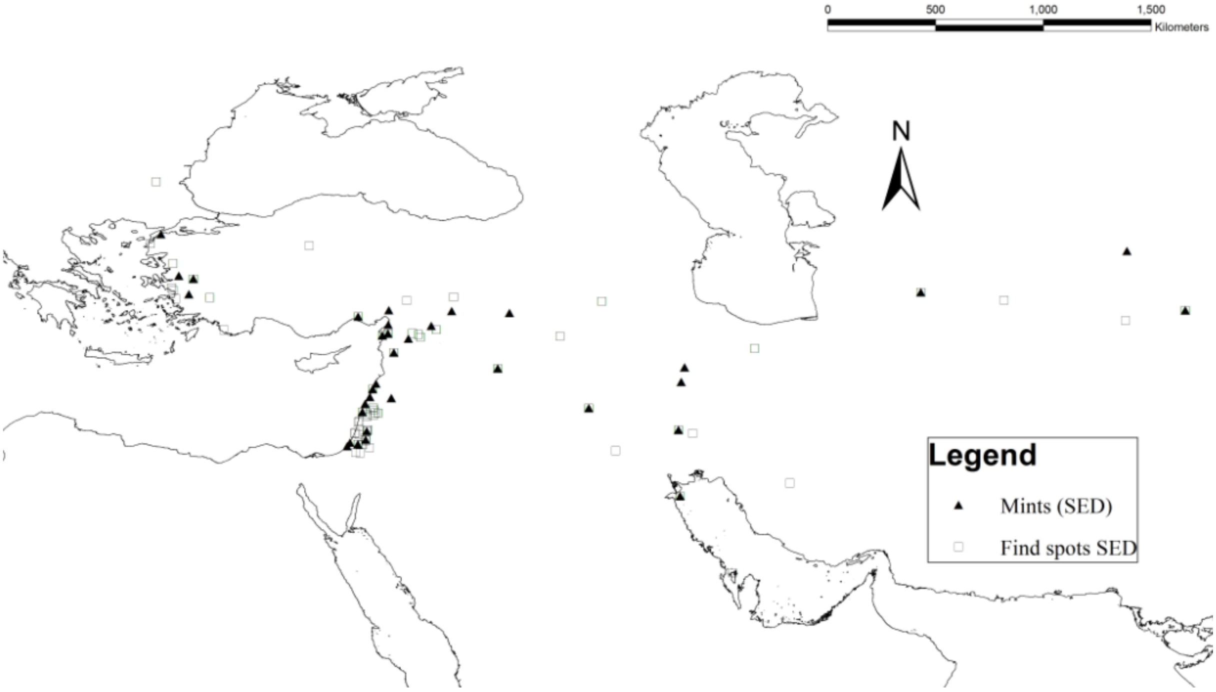
$$g_k^d = \frac{n_k^d}{n_k^d + n_k^f} \quad (1)$$

Equation 1 can be rewritten as:

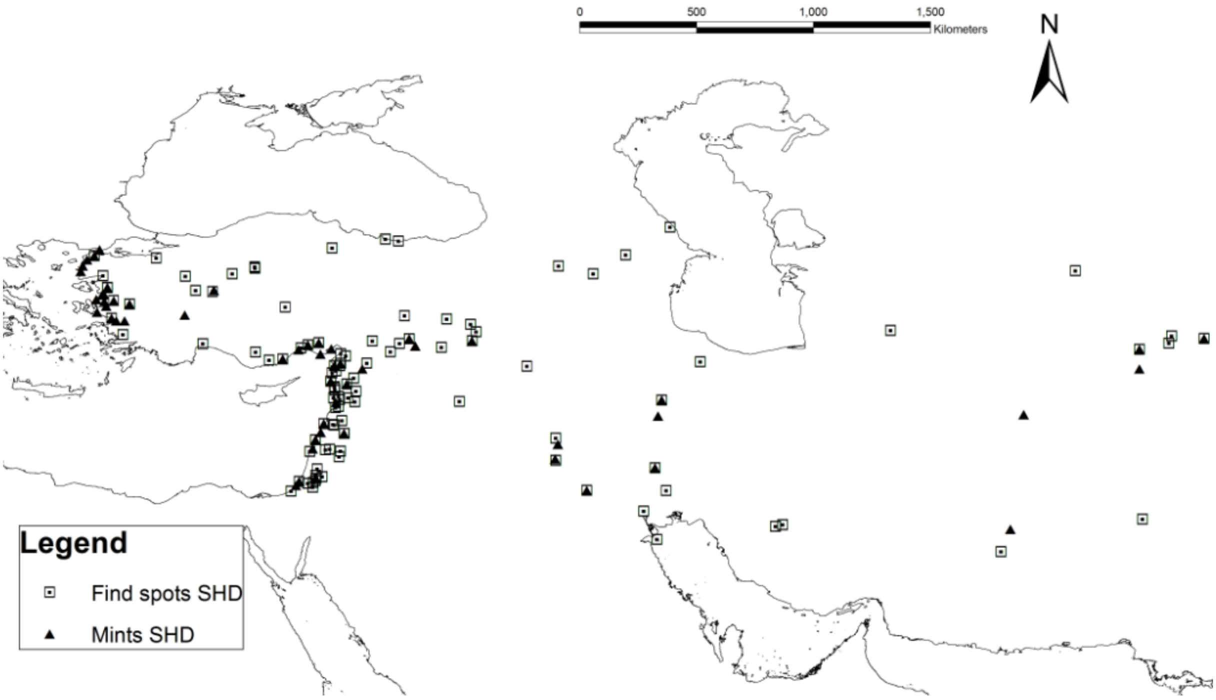
$$g_k^d = \frac{1}{1 + \frac{n_k^f}{n_k^d}} \quad (2)$$

That is, we can use the observed ratio of "foreign" to "domestic" coins per time difference group. Of course the estimates are subject to a sample bias, a risk common to all sampling processes and analyses. Also our results may be affected by our choice whether to use weights as pointed out in the previous Section. If we only consider the number of cases when at least one foreign or domestic coin was found, all observations are given the same weight. If we rather use the number of coins found, then cases where more coins were

Map 1. Places of find and minting (SED)



Map 2. Places of mint and find (SHD)



found will have more weight in determining our statistics. Both methods may result in different outcomes where in the former small hoards have a higher weight and in the latter big hoards. Unless we assume that the big hoards are somehow biased there is no obvious reason to prefer the use of weighted data over the unweighted one, hence we use both. As a result, when weighting is used, these observations may dominate other data in their respective classes.

Tables 3-5 contain our estimates for the share of domestic coins for the three types of coins (bronze excavations and hoards, and silver in hoards). The patterns are visualized in Figures 4-6. In all three cases, we find a quite strong indication that the time difference between minting and burial (column 1) is underestimated, since none of the estimates start out near 100% share for domestic coins, which is the expected value. For this reason, it is better to treat Figures 4-6 as if they were shift to the left, and even the first class reflects the

Table 3. Distribution of bronze coins by time difference between burial and minting (SED)

time difference (year)	mean time difference (year)	no. domestic cases	no. foreign cases	share domestic cases (%)	no. domestic coins	no. foreign coins	est. share of domestic coins
0	0	72	30	70.6%	240	61	79.7%
1-10	6.8	15	4	78.9%	49	12	80.3%
11-20	15.9	35	29	54.7%	734	129	85.1%
21-30	25	29	22	56.9%	103	228	31.1%
31-40	34.6	36	24	60.0%	113	139	44.8%
41-50	46.8	39	31	55.7%	2223	227	90.7%
51-60	56.1	39	10	79.6%	479	31	93.9%
61-70	64.9	21	11	65.6%	68	78	46.6%
71-	124.9	162	234	40.9%	1502	1362	52.4%

Table 4. Distribution of bronze coins by time difference between burial and minting (SHD)

time difference (year)	mean time difference (year)	no. domestic cases	no. foreign cases	share domestic cases (%)	no. domestic coins	no. foreign coins	est. share of domestic coins
0	0	1	0	100.0%	3	0	100.0%
1-10	4.6	15	5	75.0%	62	22	73.8%
11-20	15.5	11	9	55.0%	151	211	41.7%
21-30	23.7	11	1	91.7%	318	1	99.7%
31-40	34.8	8	2	80.0%	58	2	96.7%
41-50	46.6	9	2	81.8%	183	3	98.4%
51-60	56.7	5	8	38.5%	12	28	30.0%
61-70	69	1	0	100.0%	1	0	100.0%
71-	98.7	4	32	11.1%	71	153	31.7%

Table 5. Distribution of silver coins (tetradrachms) by time difference between burial and minting (SHD)

time difference (year)	mean time difference (year)	no. domestic cases	no. foreign cases	share domestic cases (%)	no. domestic coins	no. foreign coins	est. share of domestic coins
0	0	6	11	35.3%	54	28	65.9%
1-10	5	171	190	47.4%	2833	871	76.5%
11-20	15.3	86	196	30.5%	443	916	32.6%
21-30	26	59	100	37.1%	312	317	49.6%
31-40	33.1	28	93	23.1%	150	404	27.1%
41-50	44.9	52	88	37.1%	96	289	24.9%
51-60	54.5	7	33	17.5%	9	67	11.8%
61-70	65	5	65	7.1%	7	140	4.8%
71-	104.6	18	78	18.8%	36	202	15.1%

state of coin diffusion with a delay of a few years. At first sight it may appear that this is not true for the hoard data for bronze coins because at time=0 the share of domestic coins is at 100% in Table 4. Yet, this estimate is based on a single observation with 3 coins hence its accuracy is quite questionable and should be considered with caution.

In case of bronze excavation data (Table 3, Figure 4) the overall pattern indicates a gradual but limited diffusion process. Using the number of coins as weights does not alter the picture very much, except that it adds more volatility. Removing two outlier observations did not change much on the conclusion, as after about 60-70 years all measures seem to converge to a value around 50% domestic coins.

We arrive at a similar conclusion on the speed of circulation once we use the hoard data (SHD) for the bronze coins (see Table 4, Figure 5), even though the low number of observations warrant for a very cautious interpretation. This is very interesting since the excavation data are single finds, contrary to hoards. If we are to assume that the excavation data are a better reflection of real life, we may thus conclude that the hoard data are also quite representative (for excavation coins vs. hoard coins as better indicators of economic life and circulation patterns, cf. Butcher (2004, pp. 149-151).

Figure 2. Estimated share of domestic bronze coins in circulation (%) as function of time difference between minting and burial (SED)

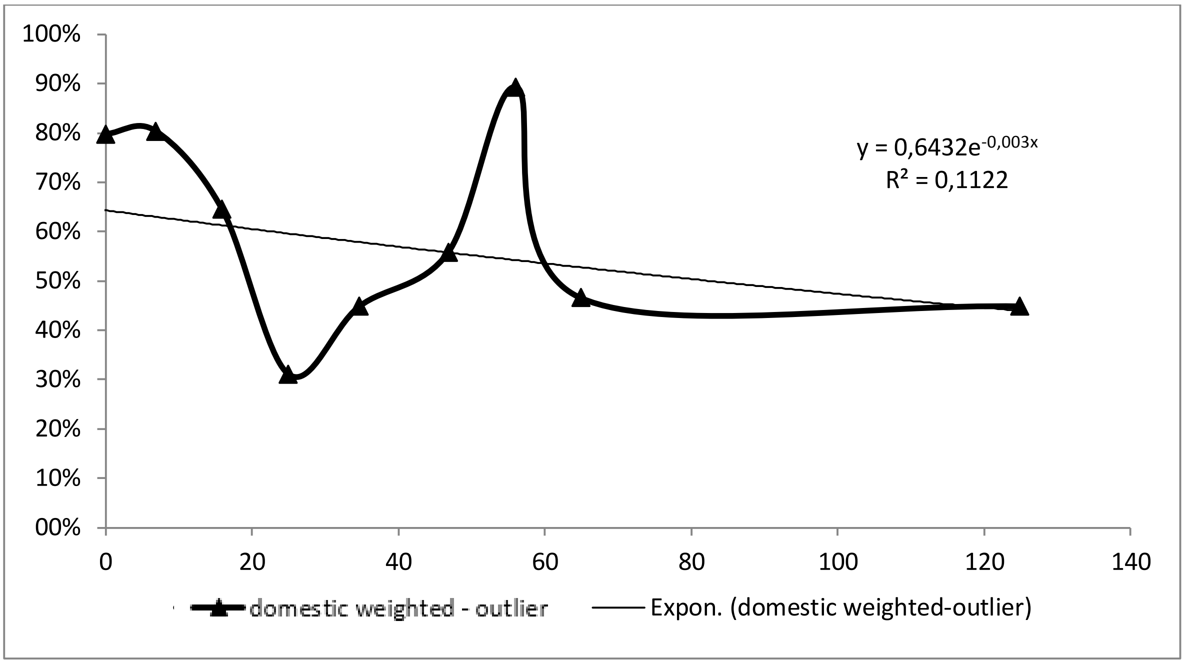


Figure 3. Estimated share of domestic bronze coins in circulation (%) as function of time difference between minting and burial (SHD)

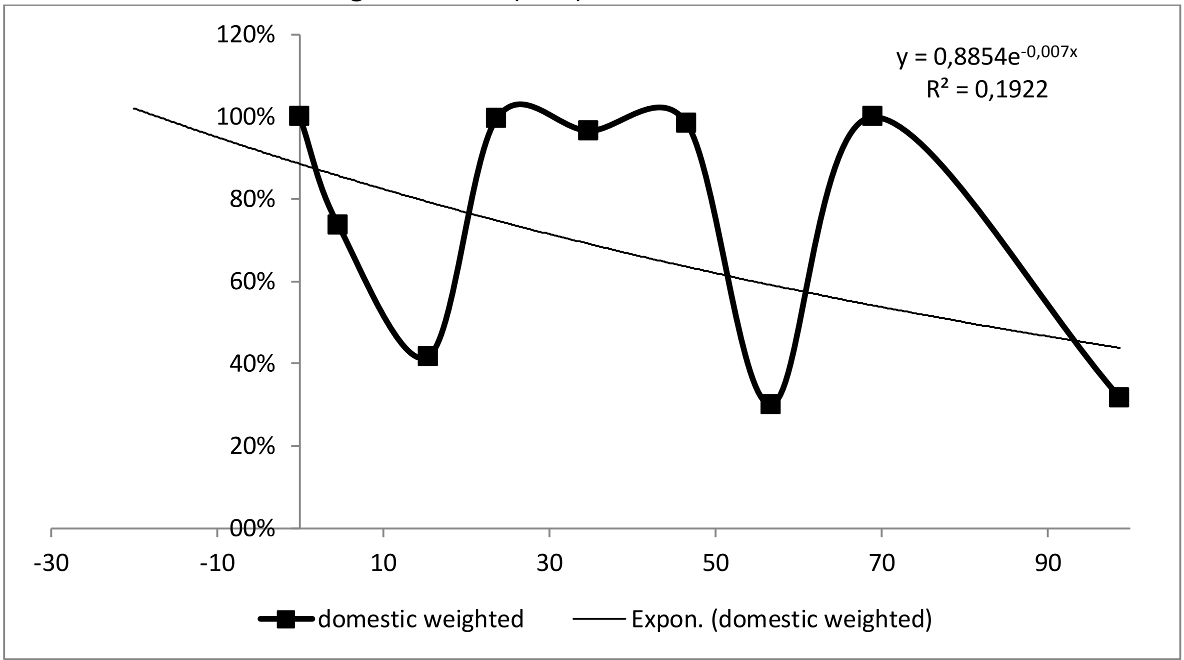
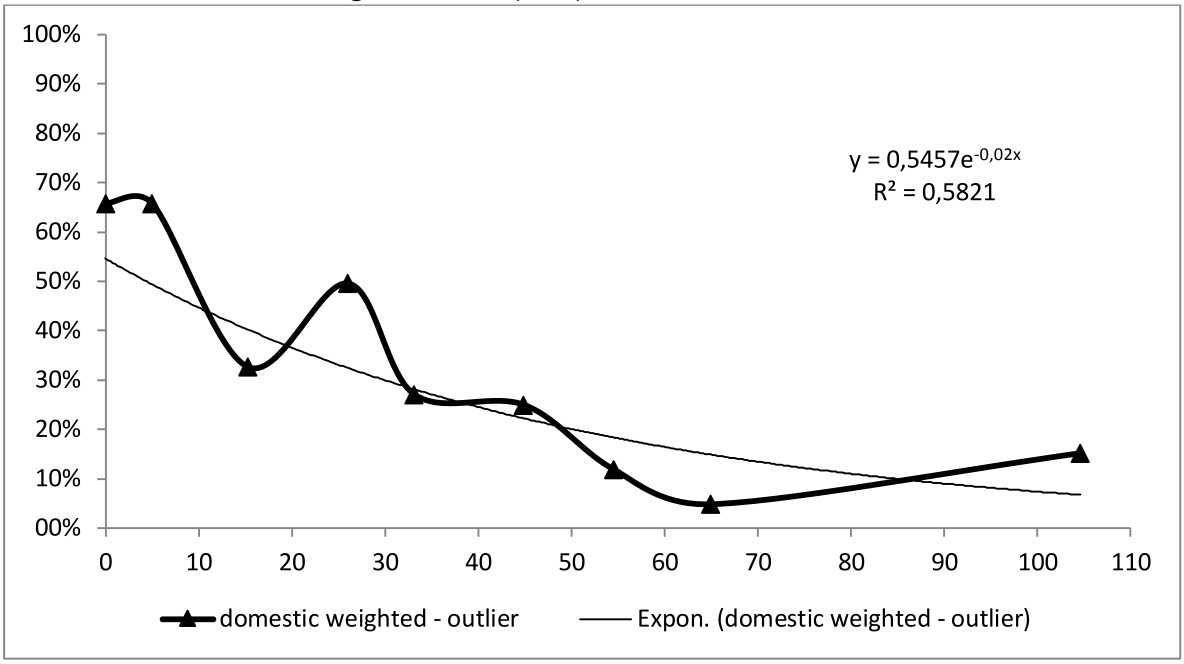


Figure 4. Estimated share of domestic tetradrachms in circulation (%) as function of time difference between minting and burial (SHD)



The results for the silver hoard coins (Table 5, Figure 6) suggest a quicker diffusion in the first years followed by a gradual and slower reduction afterwards converging to between 20%-30%. This is much lower than we found for bronze coins, which end up with ca. 50% share of domestic coins. Yet, there are several reasons for a quicker diffusion of the more valuable coins The first way is by official payments, which is even today the standard way to release a new series of coins into the circulation: the government paid the wages of soldiers and officials, or other labourers working on state projects with the new coins. In the same way Crawford explained the purpose of Roman coinage in his traditional view: "it [coinage] was used to pay the state's debts to its servants and to collect taxes" (Crawford 1970, 40-48). Such payments obviously were not limited to the same region where the coins were minted.[4] Another way is trade, when coins left the region with negative trade balance toward regions with positive trade balance (this was mostly the way Le Rider explained long distance money transfers in his rich bibliography). Carrying bronze coins must have been cumbersome; hence silver coins were most likely the preferred coins for long-distance money transfers.

But how fast was the diffusion in the two periods and regions? We can make a rough estimate by plotting the exponential function in a similar way we did for the EU, suggesting that silver tetradrachms circulated by 2% per annum versus ca. 0.5% per annum for bronze coins. We can calculate that after 10 years the share of domestic bronze coins would reduce by only 6% while the share of domestic silver coins declined by 22%. This result is about equal to the spread of coin diffusion in Germany, which was, after one year, 2.8% with a decline of 25% after 10 years.

[4] For coinage used as payment for the army, there is a very rich bibliography; cf. for the Hellenistic world, esp. the works by de Callataÿ 1997; 2000; Psoma 2009 for bronze as mean of payments; for the Roman army, see among others: Casey 1986, 82; Reece 1987, 125-126: Duncan-Jones 1990, 30-47; Butcher 2004, 143, 245-251 for the Roman case.

4. Distance effect

Just as with economic development, the circulation patterns can be explained from ultimate factors such as institutions and geography (distance), and proximate factors such as trade. Unfortunately, even though the role of ultimate factors by definition remains the same (even though their effect may diminish), the role of proximate factors may be greatly different between present day EU and the Seleucid Empire. The main reason is that we are measuring different things: within the EU we only measure chartal money, and only coins. This is by no means the main way of doing trade, or even capturing total money supply. Even though coins are also not making up the total money supply in the Seleucid Empire, they are likely to make up a much bigger share when compared to the modern EU data.

Therefore, we will only focus on a main ultimate factor of circulation, i.e. distance. In the followings, we look at the effect of regional differences on the share of different coins in the Dutch economy. We only use the data on foreign coins from the original 14 EMU members (15 minus the Netherlands).

The specification is:

$$\ln S_{it} = \beta trend_t + \eta_i + u_{it} \quad (3)$$

where S_{it} denotes the share of the coins originating from country i in the coin mass in the Netherlands in period t, and η_i and u_{it} denote the country specific effects and the random error respectively. We found no evidence for seasonal effects, hence these are not included. Since in certain years the share of coins equal zero for more remote countries and hence these are not used in (3).

The individual effects also contain the effect of distance

$$\eta_i = \alpha_{0i} + \alpha_1 dist_i \quad (4),$$

where dist denotes the distance between the capital of country *i* and Amsterdam (http://www.geobytes.com/citydistance.htm).

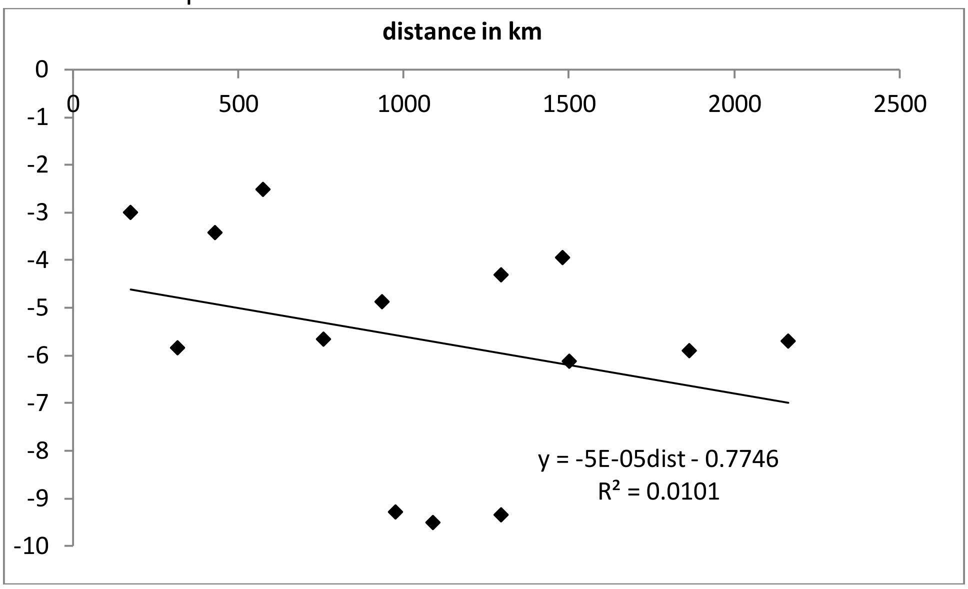
Table 6. Distance effect within the European coin pool

	coefficients
Germany	-2.527 (-68.6)
Belgium	-3.002 (-81.5)
France	-3.436 (-93.3)
Spain	-3.943 (-107.1)
Italy	-4.309 (-117.0)
Finland	-6.118 (-165.4)

Austria	-4.885 (-132.7)
Ireland	-5.659 (-153.0)
Greece	-5.696 (-154.0)
Luxembourg	-5.843 (-158.7)
Portugal	-5.905 (-160.3)
Vatican City	-9.341 (-74.0)
Monaco	-9.297 (-111.5)
San Marino	-9.510 (-92.1)
trend	0.012 (52.3)
R^2	0.991
N	1651

The relationship in (4) is visualized in Figure 7, where we plotted a linear regression line on the observed individual effects. Even though Figure 7 reflects a negative

Figure 7 The relationship between distance and share in the coin mass in the Netherlands



relationship between distance and the share of foreign coins in the total number of coins in Netherlands, the relationship is weak and statistically not significant at 10%. Hence we have to conclude that geographical distance did not play a role in the geographical distribution of foreign coins.

But would this be different for the Seleucid Empire more than 2,000 years ago when transportation was much more difficult? Below we report the data for tetradrachms and bronze coins. Since we do not have place of minting with an exact timing, we have to report lndist separately. For bronzes this turns out to be insignificant. For tetradrachms, it is

Table 6. Role of distance in the Seleucid coin pool

	bronze	tetradrachms
	coefficients	coefficients
time	0.005 .(4.26)	-0.001 (-0.56)
lndist	-0.041 (-0.86)	-0.047 (-3.25)
mintdate	-0.008 (-3.23)	-0.004 (-3.32)
Armenia	omitted	0.517 .(2.20)
Asia Minor	omitted	0.261 .(1.70)
Babylonia	0.843 .(3.53)	0.352 .(2.09)
Bactria	0.591 .(1.92)	-0.069 (-0.25)
Greece	omitted	omitted
High Satrapies	0.545 .(1.54)	omitted
Levant & Syria	0.225 .(0.67)	-0.271 (-1.68)
Mesopotamia and Media	0.329 .(1.14)	0.080 .(0.44)
Constant	1.935 .(3.62)	1.692 .(5.68)
R^2	0.140	0.106
N	116	474

negative and significant, i.e. if the distance with a region increases by (?) 1 %, you have 0.047% less coins from that region. Yet, this is also a very small number suggesting that both within the present day EU as within the Seleucid Empire distance did not really affect the coin diffusion.

5. Conclusion

In recent empirical research a fast diffusion of euro coins is found, which is often explained by the modern phenomenon of a common market and monetary union. Yet, one should bear in mind that in history many regions at times had a common (or exchangeable) currency. It is therefore questionable whether the European experience is exceptional after all.

In this paper we estimated the speed of coin diffusion both within the EU in the first two decades of the 21th century and within the Seleucid Empire during the 4th-1st century BC. Despite the two and half millennia time difference, we find that the speed of coin diffusion was comparable between silver Seleucid coins and euro coins, i.e. ca. 2% per annum and 25% over 10 years. Only Seleucid bronze coins have a very slow rate of diffusion (ca. 6% in 10 years) due to their nature and limited role in Seleucid economy.

The reason why the diffusion speed is almost identical is less easy to ascertain. If we look at the ultimate factors of diffusion, institutions and geography, we find that the effect of geography was negligible in the EU and the Seleucid Empire alike. By implication, this could mean that the effect of institutional obstacles was also almost identical between the Seleucid Empire and the EU.

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