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Art and Markets in the Greco-Roman World

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Art and Markets in the Greco-Roman World

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Abstract

We study art markets in the Greco-Roman world to explore the origins of artistic innovations in classical Greece and mass production of imitative works in the Roman Empire. Economic factors may have played a role, on one side fostering product innovations when few rival Greek city-states competed outbidding each other to obtain higher quality artworks, and on the other side fostering process innovations when a large integrated market promoted art trade across the Mediterranean Sea. The evidence on art prices is consistent with this. Literary evidence on classical Greek painting from V-III centuries BC (largely from Pliny the Elder) shows that the real price of masterpieces increased up to the peak of creativity reached with Apelles. Epigraphic evidence on Roman sculpture from I-III centuries AD (largely from inscriptions on the bases of statues) shows that the real price of statues was stable and largely equalized across the imperial provinces.

Keywords: Art markets, Ancient economy, Greco-Roman world

JEL Classification: Z11

An increase in the number of coppersmiths produces a fall in the price of copper work, and the coppersmiths retire from business. The same thing happens in the iron trade. Again, when corn and wine are abundant, the crops are cheap, and the profit derived from growing them disappears, so that many give up farming and set up as merchants or shopkeepers or moneylenders. Xenophon (Poroi, 4, 6), 354 BC.

The various arts known to mankind, in spite of the differences of their functions and achievements, are yet all concerned to make money, some earning less, some earning more, and some just enough to live upon ... and by the arts which border upon liberal I mean those of the painter, modeller, sculptor. Philostratus (Life of Apollonius of Tyana, VIII, 7, 3), 238 AD.

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1. Introduction

Classical Greece developed artistic innovations that affected the history of mankind and that we know mostly through later copies produced and traded during the Roman Empire. In this work we explore the economic determinants of artistic production and innovation in the Greco-Roman world analyzing the markets for paintings and statues of those periods. We do so on the basis of two limited sources of evidence that are available for those ancient markets. The first are literary sources that survived until our days. The most important is the *Naturalis Historia* of Pliny the Elder (23/24 – 79 AD), published in 77 AD, an encyclopedic work on all the fields of human knowledge at the time, which includes books on art history largely based on earlier Greek sources.² Pliny and a few other historians have provided valuable information on ancient artists and, for our purposes, also on the price of a variety of artworks, in particular paintings from classical Greece. The second source of information on art trade and prices is represented by epigraphic sources, namely inscriptions on stones, which occasionally provide evidence on art commissions, in particular sculptural decorations of temples, forums and baths of Roman towns. The main source on the price of Roman statues is represented by inscriptions found around the provinces of the Roman Empire and collected in various sources (especially the fundamental work of Duncan-Jones, 1982).³ Our purpose is to use this evidence to shed new light on the nature of art production and its evolution in the Greco-Roman world.⁴

The main question we explore is why unprecedented artistic innovations took place in classical Greece between the V and the III centuries BC, while most of the artistic production at the height of the Roman Empire between the I and the III century AD was directed toward mass production of imitative works. These periods had much in common in terms of cultural values and socio-economic organization, but there were various factors that may have shaped differences in the evolution of artistic creativity. Our limited goal is to emphasize a structural difference between art markets in classical Greece and the Roman Empire that may have affected the incentives to innovate and verify whether such a mechanism is consistent with the available evidence. The structural difference is about the size of the relevant art markets in the Greek world and the Roman Empire, which may have determined the propensity to invest in product innovations or process innovations, with different consequences on the trends of art prices.

The Greek civilization developed (for the first time and contrary to earlier monocratic civilizations) a socio-economic environment organized in various city-states distributed on a small region across the Aegean Sea. These *póleis* were rival not only from a political and economic point of view, but also in the competition for artworks needed to decorate sanctuaries, temples and palaces, which attracted the artistic activity of itinerant artists and fostered a series of quality-enhancing innovations,

² The records of Pliny on ancient masterpieces derive from earlier Greek manuscripts that are now lost. See Coulson (1976) and Isager (1991) for a discussion on how reliable are these records.

³ Latin inscriptions are collected in the *Corpus Inscriptionum Latinarum*, as Greek inscriptions in the *Inscriptiones Graecae*, and their online derivations are constantly updated with new findings (see the Clauss/Slaby dataset). This made it possible to complete existing datasets with inscriptions discovered or published in the last four decades. The content of epigraphic sources is highly reliable, though the text of the inscriptions is not always fully readable.

⁴ For art historical accounts with some emphasis on the social history of art see in particular Moreno (1987), Stewart (1990) and Seaman and Schultz (2017) for Greek art, and Bianchi Bandinelli (1980), Kleiner (1992), Strong (1995) and Stewart (2008) for Roman art. Relevant english translations of the classics can be found in Pollitt (1983, 1990).

aimed at the imitation of nature or *mimesis*. The same Pliny associates the glory of the Greek painters with the fact that they worked for cities, rather than decorating domestic interiors as in his own times (Pliny, 35, 118). While the Greek *póleis* were outbidding each other to obtain works of higher quality, the prestige and social status of the artists improved and the effective prices of their commissions increased. The empirical support that we can offer for this path of artistic innovations, of course limited by the paucity of the available data, relies on the increasing prices of masterpieces between the Periclean age and the peak of creativity reached with Apelles at the time of Alexander the Great. Prices of paintings mentioned by literary sources for the major artists of this period exhibit an increasing trend in the estimated year of execution, also after controlling (under a variety of heroic assumptions due to the nature of the data) for changes in purchasing power (from Loomis, 1998), proxies of the complexity of compositions as the estimated number of figures, differences between primary and secondary markets and measures of quality as perceived at the time, through fixed effects for artists and an index based on the space dedicated to each artist in the account of Pliny. The age of the city-states and of great art declined with the expansion of the Hellenistic world, starting a gradual transition toward a new era.

The Roman conquest of new territories through the Mediterranean Sea reached regions that were much more advanced from an artistic point of view, including Greece itself. This generated a new demand of artistic objects that was initially satisfied by the spoils of war, then by the production of copies in workshops employing slaves (in a constant flow from eastern provinces) and freedmen (i.e. former slaves manumitted by patrons in return for work), and finally by a florid trade of art across the Roman Empire. Since the age of Augustus, the so-called *Pax Romana* insured peace and safe trade across the Mediterranean Sea and over a network of roads that reduced transport costs across all the imperial provinces (see Flückiger *et al.*, 2022). This created the incentives for workshops producing precious objects to serve the demand of distant provinces and also of middle class customers (as evident from the rests of Pompeii, where a large part of the houses were decorated with wall paintings), stimulating mass production by anonymous artists, the development of cost-savings innovations and the imitation of past art rather than the investment in quality-enhancing innovations. At the same time, sculptors and wall painters (as well as later producers of sarcophagi and mosaicists) could either ship their works or migrate where demand was higher, generating a powerful market mechanism that avoided substantial differences in art prices across the provinces of the Roman Empire. We provide evidence for this competitive process and the high level of the market integration across the Roman Empire showing that the price of statues was stable over time and, most of all, largely equalized across the main provinces of the Empire after controlling for their main characteristics.

In particular, we build on the works of Duncan-Jones (1982), Drinkwater (1979, 2014) and Curchin (1983, 2014), and put together a dataset of more than two hundred observations on commissions of statues from Italian regions and various provinces (mostly from Numidia, Africa Proconsularis, Asia, Hispania Baetica, Gallia, Mauretania Caesariensis and Germania Superior). We have information on the prices of commissions, the date in which the statues were executed, the number of statues in the commissions, whether the destination was a large or coastal town and, typically, information on the subject of the statues (of an emperor, a divinity or a donor), the material (bronze, silver or marble) and the dimension (small or large). Price variability is extremely large, but in part explained by

observable characteristics, with higher prices for commissions of more statues, larger statues, silver-plated statues (compared to marble ones and bronze ones) and in case of testamentary outlays. As one should expect, coastal towns are associated with lower prices (due to lower shipping costs) and large towns with higher prices (possibly due to higher purchasing power), though both effects are not statistically significant, while the subject of the artworks does not appear to affect prices. The nominal prices appear to be slightly increasing from the I century to the period of the emperors Trajan and Adrian (98-138 AD), the Antonini emperors (138-192 AD), the dynasty of the Severans (193-235 AD), and the Mid III century, but differentials (compared to cases of unknown date) are not statistically significant. Most, important, once we control for all the observable characteristics of the artworks, the prices do not exhibit significant differences across the main areas of the Roman Empire, grouped as Numidia, Africa, Mauretania, Spain, North Europe, Italy, Greece and Asia: this suggests that market integration was deep enough to largely equalize prices across a huge territory. Since the last part of the period under consideration was characterized by inflationary pressure (see Temin, 2017, Part I), we consider also a restricted dataset for which we have more precise estimates of the year of execution and we control for changes in purchasing power (from Wassink, 1991): in such a case there is no trend in real prices over the entire period and again there are no significant price differentials across provinces of the Roman Empire.

Our analysis relates to works on the economic history of the ancient economy focused on classical Greece (Cohen, 1992; Amemiya, 2007; Bresson, 2016) and the Roman Empire (Rostovtzeff, 1957; Duncan-Jones, 1982, 1990, 2016; Temin, 2017). With reference to art historical studies, Stewart (1990) has emphasized aspects of the social history of Greek art and Stewart (2008) has done the same for Roman art, but with limited attention to economic mechanisms or quantitative approaches. In the archeological literature, recent works by Harris (2005) and Flohr (2019) have applied quantitative approaches to study Roman domestic decorations, while Russell (2013) has explored the market for stones as well as statues and sarcophagi in the Roman empire. Our work is mostly related with the literature on the history of art markets, which is largely focused on more recent times (for surveys, see De Marchi and Van Miegroet, 2006, and Borowiecki and Greenwald, 2018).⁵ Nevertheless, one can find similar patterns in these other periods. The artistic innovations of Renaissance Italy flourished in an environment populated by few public and private patrons competing to attract the best artists to rival towns, in a period where the real price of paintings was rapidly increasing (Etro, 2018) and workshops were organized to promote artistic innovations (Piano and Piano, 2022, 2023). Instead, the art market of the XVII century in the Netherlands became closer to a large integrated market due to the unprecedented extension of demand of paintings to the middle and low class, which fostered mass production and cost-saving innovations (De Marchi and Van Miegroet, 2006; Montias, 2002), with real prices of paintings that were stable or declining once the market was saturated with painters (Etro and Stepanova, 2016). Even Paris after the liberalization of art exhibitions at the end of the XIX century was characterized by a relatively small art market with competition between art dealers looking for new artists and new art, which fostered the revolutions of impressionists and the clustering of other avant-garde schools (Galenson and Jensen, 2002;

⁵ See Montias (2002), Galenson (2006), Hellmanzik (2010), Etro and Pagani (2012), Graddy (2013), Etro *et al.* (2015), Piano and Piano (2022, 2023) and Piano and Hardy (2022) on painting, Borowiecki (2022) on music and Giorcelli and Moser (2020) on opera. For reviews see Hulst (2017) and the forthcoming special issues on the *Journal of Cultural Economics* and *European Review of Economic History*.

O'Hagan and Hellmanzik, 2008; Hellmanzik, 2010) in an environment with rapidly increasing prices (Etro *et al.*, 2020).⁶ Instead the globalization of art demand in the first half of the XX century was associated with what one may consider the most extreme form of cost-saving innovations, namely the switch to abstract art, as well as with low prices in the primary market (Jensen, 2022). Our tentative claim is that these patterns have been related to the structure of the art markets since their origins.

The paper is organized as follows. Section 2 introduces art production in ancient times and our primary sources. Section 3 analyzes differences between classical Greece and imperial Rome in the organization of workshops, the contractual agreements, the approaches to product differentiation, and the social status of artists, and draws predictions for the empirical analysis. Section 4 presents evidence on art prices in classical Greece. Section 5 presents the evidence about statues in the Roman Empire. Section 6 concludes.

2. The art market in the ancient world

Forms of art were developed since the formation of the first sedentary communities, which made it possible for some of their members to specialize in artistic decorations. Further institutional developments in the early civilizations of Mesopotamia and Egypt generated the demand of artistic commissions for temples and palaces. However, the monocratic authorities of those civilizations tended to promote massive constructions and the perpetuation of stylized celebratory art executed mainly by slaves and anonymous artisans rather than foster innovations by free artists.⁷

Some form of art trade must have taken place in these and more recent civilizations, as the Minoic and Mycenaean civilizations, with barter involving especially pottery, armoury and jewelry. An echo of this remains in the *Iliad* (VIII century BC) where Homer describes the exchange of a golden armour of the Trojan Glaucus worth a hundred oxen with a bronze armour of the Achaean Diomedes worth nine oxen (Book VI), and elsewhere mentions the value of various awards assigned by Achilles to the winners of contests (Book XXIII):

“For the winner [in wrestling] there was a great tripod ready for setting upon the fire, and the Achaeans valued it among themselves at twelve oxen [...] The son of Peleus then offered prizes for speed in running - a mixing-bowl beautifully wrought, of pure silver. It would hold six measures, and far exceeded all others in the whole world for beauty; it was the work of cunning artificers in Sidon, and had been brought into port by Phoenicians from beyond the sea, who had made a present of it to Thoas. Eueneus son of Jason had given it to Patroclus in ransom of Priam's son Lycaon, and Achilles now offered it as a prize in honour of his comrade to him who should be the swiftest runner. For the second prize he offered a large ox, well fattened”.⁸

By the end of the VII century BC the Aegean world was composed of a multitude of independent *póleis* led by aristocratic institutions and connected by a florid trade network and a monetary system

⁶ It has been noticed that also the leading role of Germany in the arts would decline with the founding of an empire because the healthy competition between patrons in small duchies and principalities would end. For a systematic analysis of the emergence of creativity in European towns over centuries see Serafinelli and Tabellini (2022).

⁷ It seems significant that the oldest between the seven wonders of the ancient world were the great pyramid of Giza of the XXVI century BC and the hanging gardens of Babylon built at the end of the VII century BC.

⁸ Homer, *The Iliad*, XXIII. English Translation by Samuel Butler. Emphasis added.

based on the minting of gold and silver coins (according to Herodotus, introduced in Lydia, at least by 650 BC). Gradually some city-states led by Athens developed more inclusive political institutions where individualism and private enterprise could flourish. Inter-regional trade was expanding, and soon it was even supported by the emergence of a rudimentary credit system focused on maritime loans (Cohen, 1992). As argued in a definitive way by Temin (2017, Part II), it was the beginning of a real market economy whose structure will be inherited by the larger and integrated markets of the future Hellenistic and Roman worlds. Between the V and IV century, a variety of crafts developed their own markets and we have the first evidence of an art market and of prices of artworks. Before discussing this, however, we need to describe the economic and monetary system of the ancient world.

2.1. Economic and monetary system of the Greco-Roman world

Ancient Greece was characterized by intense trade between *póleis*. The monetary system was dominated by the silver *drachma* of Athens, which since the reforms of Solon at the beginning of the VI century, corresponded to 4.33 grams of silver and was divided into 6 silver obols. The relevant units of account for our purposes were either the *mina*, corresponding to 100 drachms, or the *talent*, corresponding to 60 mines or 6,000 drachms. We have fragmentary but useful information on the real value of a drachm between the V and the III century BC which is based on the compensation of workers in classical Athens, with substantial evidence on soldiers, sailors, manual workers, public officeholders and others. The typical wage of an unskilled worker was around a drachm and three obols per day, while skilled figures could also reach three drachms per day (Bresson, 2016; Loomis, 1998): however, these wages refer mostly to the public sector and do not take into account other benefits and sources of income that were ordinarily added to basic wages, therefore the effective income in the private sector may have been somewhat higher. In practice, if an unskilled worker could earn a talent over ten years, it does not seem unreasonable that a successful skilled worker with additional sources of income could do it in a much shorter time or even in a single year.

The comparison over time of wages for similar occupations is less speculative, and has allowed Loomis (1998, Ch. 15) to reconstruct the pattern of wage inflation over two centuries spanning between 450 BC and 250 BC. The period 450-432 BC was the core of the Periclean age in Athens, when the democratic institutions promoted both private enterprise and public investments,⁹ and the limited evidence suggests that there was a broad 50% rise in wages during this period, probably associated with the large revenues obtained by Athens after eliminating the Persian military threat and before the outbreak of the Peloponnesian war. The period 432-412 BC appears instead characterized by a substantial wage stability, followed by heavy wage cuts in the order of 50-100% in the period 412-403 BC, with a full recovery in the next decade. The period 403-330 BC was characterized by constant tensions and conflicts between Greek *póleis*, but with a substantial equilibrium between the most powerful ones (Athens, Sparta and Thebes) and their allies; the evidence of this long period suggests an increase of wages, with overall growth around 100%. This increase in earnings may have been accelerated with the large inflows of gold and silver captured by

⁹ A speech by Pericles exemplifies the novel attitude of the Athenians toward business: “wealth we employ more for use than for show, and place the real disgrace of poverty not in owning to the fact but in declining the struggle against it. Our public men have, besides politics, their private affairs to attend to, and our ordinary citizens, though occupied with the pursuits of industry, are still fair judges of public matters” (Translation from Thucydides, *The Peloponnesian War*, New York, E. P. Dutton. 1910).

Alexander the Great in his military campaign in Persia (where apparently he collected 180,000 talents, part of which was distributed to the veterans or spent in artistic commissions): the period 330-300 BC provides evidence of a further increase of 25-50% in compensations. Finally, the period 300-250 BC appears to be characterized by a minor drop between 10% and 33%. This covers the centuries under investigation in our empirical analysis on Greece, while information on the subsequent Hellenistic world is only fragmentary.

In spite of the continuity between the Greek world and the Roman one in terms of culture, religion, and even urban organization of the market, centred earlier in the *agorà* and then in the *forum*, the rapid expansion of Rome through the Mediterranean Sea developed a radically different socio-economic structure. The Roman Empire became a large integrated economy with political, administrative and military power concentrated in the hands of the emperor and extractive institutions located in peripheral provinces (Hopkins, 1978), but also with an efficient organization that could protect peace, legality, infrastructures and trade for a long period and over a huge area. The so-called *Pax Romana* of the first centuries of the Empire made it possible to build a well organized network of trade routes through the whole Mediterranean Sea and the main provinces (see Flückiger *et al.*, 2022) fostering a lively market economy (Rostovtzeff, 1957; Temin, 2017, Part III) and even the emergence of large scale entrepreneurial activities which were quite effective at minimizing costs and differentiating production (see Rathbone, 1991). As emphasized by Rostovtzeff (1957, p. 170), “the emperors retained the moderate custom-duties which were levied on the frontiers of all provinces, and encouraged those merchants and shipowners who were necessary to the state by granting them privileges and so allowing them to develop their business and their professional organizations. Thus in the sphere both of foreign trade and of internal commerce, whether between or within provinces, the policy of the government remained a policy of *laissez-faire*.”

The Roman monetary system was inherited from the Greek one: the silver *denarius* corresponded roughly to a drachm, and was divided in 4 brass *sestertii*, where the *sestertius* (HS) was the main unit of account. Accordingly, a talent corresponded to 24,000 sestertii. The system was rather stable for more than two centuries across the entire Empire. Tensions due to the bimetallic system, fluctuations of coinage and imperial finances were common, but inflation must have been modest until the last decades of the III century. At the very end of that century a sort of hyperinflation spread through the whole Empire. In 301 AD the Edict of Diocletian tried to regulate prices to contrast it, but was largely unsuccessful (Temin, 2017) and the crisis led to a rapid demonetization of the economy.

Reconstructing a price index for the first three centuries of the Roman Empire is complex, but fragmentary time series available for the price of wheat, wine, donkey-hire or the wage for digging or harvesting from different locations appear to suggest the presence of a low inflation for most of the period. This is also consistent with changes in the legionary salaries, which probably provide the best proxy for changes in purchasing power (Greene, 1986; Duncan-Jones, 1994). On this basis, Wassink (1991) has advanced a price index for the first three centuries of the Roman Empire. In the period 0-64 AD there was a 15-25% reduction in the price level which was entirely recovered by 100 AD. The price level increased by 100% over the entire next century up to 200 AD, with a further increase by 33% in the period 200-215 AD. By the middle of the III century the price level would

have been three times higher than at the beginning of the period under consideration, which corresponds to a modest 0.7% of annual inflation on average.¹⁰

With this background we now move to reconstruct the development of the markets for sculpture and painting from ancient sources. At a first reading one may want to move to the next section for a comparative analysis of the organization of art markets in classical Greece and the Roman Empire and the statement of our testable predictions.

2.2. *The market for sculpture in the Greco-Roman world*

The ancient Greek civilization gave birth to an unprecedented number of artistic personalities. Stewart (1990) mentions over a thousand sculptors known from literary or epigraphic sources, of which about two hundred are listed by Pliny and almost a hundred have left some substantial evidence through attributed works and copies or through extended treatment by ancient sources (rarely both). However, the extant Greek bronze statues are just about thirty, and most of the Greek marble sculpture cannot be attributed on solid grounds. A large part of the extant ancient statues derives from the Roman world, which instead has barely left few names of original sculptors.

The first Greek artists described by ancient sources were from the Archaic period of the VII and VI centuries BC. We have evidence of a variety of sculptors from many different city-states in mainland Greece and the islands,¹¹ a sign that there was already a common market attracting entry of artists in the area. Static representations of human figures (*korai* and *kouroi*) were evolving through artistic as well as technical innovations, as the one of casting hollow bronze statues. Early sculpture was often associated with idealized portraits of victorious athletes from competitions in the Olympic games, and masterpieces of the severe period as the “Charioteer” of Delphi and the “Discobolus” by Myron of Eleutheræ were in this tradition. The great masters of the V and IV centuries BC were mostly focused on standalone statues of gods and heroes in bronze and, less often, in marble, but their workshops were also involved in the decoration of temples with mythological cycles on pediments and metopes.

The earliest major sculptor, Phidias of Athens, was the main artistic supervisor of the massive building program undertaken by Pericles in the democratic Athens of the mid V century BC, after the Persians destroyed the old Acropolis in 480 BC. A large team of architects and sculptors was engaged for years to build and decorate the Parthenon by 437 BC, the Propylæia by 432 BC and then the Erechtheion by 405 BC. Many inscriptions have been found with fragmentary records of payments for the marble decorations of these temples: while they provide evidence of somewhat differentiated fees, they are insufficient to reconstruct prices of precise artworks. For instance (Pollitt, 1990, pp. 190-193), the building accounts of the Parthenon mention 16,392 drachmas paid for the pedimental sculptors (I.G. I³ 449), and those of the Erechtheion mention 3,315 drachmas paid for the marble reliefs attached to the limestone frieze (I.G. I³ 476), with different payments mentioned for each work in the order of 60 drachmas per figure, which is consistent with the earnings of ordinary manual

¹⁰ This covers the entire period explored in our empirical analysis, but we should add that by 274 AD the price level will be seven times higher, by 293 AD fourteen times higher and by 301 AD seventy times higher.

¹¹ The same names report a list of city-states, as for Smilis of Aegina, Archemos of Chios, Theodoros of Samos, Gitiadas of Sparta, Hageladas of Argos, Kanachos and Aristokles of Sikyon or Endoios and Antenor of Athens.

workers.¹² It should be remarked that reliefs for friezes and metopes were considered of secondary importance compared to standalone statues, which resonates well with the fact that Phidias was only coordinating the works on the Parthenon. He was known to earn ten times the rival sculptors (Plato, *Meno*, 91), and was certainly paid much more for the execution of the colossal chryselephantine statues of “Athena” for the Parthenon (438 BC) and “Zeus” for the temple of Olympia (435 BC). The latter was going to be one of the seven wonders of the ancient world.¹³

In this period the high demand of artistic works for public buildings in Athens must have fostered entry of new artists and competition.¹⁴ Pliny supports this conjecture with abundant anecdotal evidence on a competitive environment, mentioning for instance the contest between two disciples of Phidias, Alkamenes of Lemnos and Agorakritos of Paros, in the production of a statue of Aphrodite (Pliny, 36, 17): the Athenian judges awarded the victory to the former, and the latter sold his statue at the condition that it should be called “Nemesis” and should not remain in Athens. In 421-416 BC Alkamenes was paid 5.5 talents (33,310 drachms) by Athens for bronze statues of Athena and Hephaistos (Stewart, 2019). Another anecdote refers to a later competition between five sculptors in the production of statues of Amazons for the temple of Artemis in Ephesus, with votes by the same competitors: Polykleitos of Argos was judged second by each artist and won the contest, followed by Phidias (Pliny, 34, 53). As the art historian Stewart (1990) puts it, “not only did sculptors compete, both formally and informally, for commissions, but their styles directly reflect this state of affairs, as each sculptor tries to outdo his predecessors and contemporaries in mimetic prowess.” When the main public works of Athens were over, many artists started supplying their services to the private sector, as confirmed by the sudden emergence of funerary *stelai* with reliefs, which had been forbidden since the beginning of the V century, and started to spread not only for the higher class, but also for the lower class: about six thousand Athenian gravestones are preserved between 430 BC and the next ban in 317 BC, and their production must have insured a constant flow of profits for a large pool of sculptors, creating the conditions for the emergence of superstars (*à la* Rosen, 1981) ready for major commissions.

We have rare information on the price of statues of the high classical period, but there is one notable exception. It belongs to the final decades of the V century, when artistic commissions continued to flourish in various city-states in spite of the Peloponnesian war. The “Diadumenos”, or youth tying a headband, was a famous bronze statue made by Polykleitos around 420 BC of the value of 100 talents according to Pliny (35, 55). It is known from about thirty Roman copies, and has the honor of being the oldest figurative artwork for which we know the author, the visual aspect and the price. The latter was by all standards exceptional, but this statue represented a new canonical model for sculpture, based on the chiasmic arrangement of relaxed and weight-bearing limbs. Moreover, we cannot exclude

¹² Concerning the cost of the entire Parthenon, Stanier (1953) computes a lower bound of 469 talents (with 17 talents for pedimental sculptures and akroteria, 12 for the inner frieze and 10 for the metopes) on the basis of comparisons with the cost of other temples, but the figure of 2,012 talents suggested by Heliodoros for the cost of the Propylaea would push for a much higher estimate, in the order of 7,000 talents. Other literary sources inform us that the tyrant of Akragas in Sicily was entrusted with 200 talents to build a temple of Zeus in 570 BC while the contract price for rebuilding the temple of Apollo at Delphi (burnt in 548 BC) had been of 300 talents (Coulton, 1977, p. 22).

¹³ The combination of gold and ivory in chryselephantine statues was the most valuable option, and represented a store of value: Pericles had to reassure the Athenians that the gold used for the statue of Athena could be removed in dire need.

¹⁴ The effects of urban clusters on the productivity and creativity of artists has been emphasized in more recent periods (see O’Hagan and Hellmanzik, 2008, and Hellmanzik, 2010).

that Pliny was mentioning a price recorded in the secondary market when the statue became a famous benchmark for later artists. Not by chance, the Polykleitan school dominated sculptural commissions in the following decades.

The defeat of Athens by Sparta at the end of the V century did slow down public commissions in Athens for a few decades, but ultimately contributed to spread its institutional and economic organization throughout all of Greece. And new public commissions flourished soon elsewhere. Timotheos of Epidauros was active in the first half of the IV century BC, and surviving inscriptions in the temple of Asklepios at Epidauros (built around 380 BC) mention his payment of 900 Aeginetan drachmas to furnish relief models and 2,240 to make akroteria for one pediment of the temple (Pollitt, 1990, pp. 104-5), out of a total of 10,580 drachmas for works on two pediments, each one thirteen meters long (Stanier, 1953). Hektoridas and another sculptor whose name is not readable in the inscription took up the contracts for sculptures in the other wing of the pediment for 3,010 drachms each. However, we cannot establish whether these were final payments and what was the exact entity of the works of these artists.¹⁵ Such a compensation by piece was not ideal to incentivize effort and care in details, but architectural sculpture had to be seen at distance, and details were less important than other aspects, such as deadlines.¹⁶

New heights for the arts were achieved during the middle of the IV century BC. “Well financed and apparently stimulated by the continued intercity rivalries, architects, sculptors, and painters forged a ‘second classicism’ that sought to rival the achievement of the first. In Athens, state commissions (chiefly for divine images and portraits) were fairly numerous ... the new moneyed élite, prosperous from trading, banking, mining, and industry, now offered a market that was richer and larger than ever before” (Stewart, 1990, p. 175). And important commissions came also from Thebes, Olympia, Delphi, Nemea, Argos, Sikyon, and many other towns, such as Halikarnassus with the construction of the Tomb of Mausolus (351 BC) and Ephesus with the reconstruction of the temple of Artemis (323 BC), both of which will join the group of wonders of the ancient world. Payments for architectural sculpture were probably increasing if Androsthenes was paid 18.6 talents (112,000 drachms) for the pedimental figures of the temple of Apollo in Delphi (Seaman and Schutz, 2017). The greatest marble sculptor of the time was Praxiteles of Athens. Pliny (35, 20-21) tells us that he put on sale two marble statues of “Aphrodite” for the same price: one of them was draped, while the other was not, and was probably the first full-scale female nude. The citizens of Kos, who had an option on the sale, bought the former and refused the latter. The naked Aphrodite was then purchased by the city of Knidos and became the symbol of the Knidians. Three centuries later, the king Nicomedes of Bithynia offered to pay off the entire debt of the city in exchange for that statue and the offer was rejected: we do not know the amount of that debt, but it must have been quite large, suggesting a major evaluation in the secondary market. Also in this case we are talking of what was

¹⁵ Since the Aeginetan drachma contained 40% more silver than the Athenian drachma, the total payment corresponded to about 2 and a half talents. Interestingly, the same inscriptions mention payments for many other artistic works, including a compensation of 350 drachmas a year for the architect Theodoros (and the construction of the temple lasted four and a half years) and a compensation of 767 drachmas for Protagoras related with encaustic painting on the beam-support and the cyma.

¹⁶ As noted by Stewart (1990, p. 60), at “Epidauros, Tegea, Delphi, and Delos, the commissions therefore appointed local financial guarantors as insurance in case of default, inspected the completed work, and levied heavy fines if they were dissatisfied: fines for delay were many times greater than those for bad workmanship ... Not surprisingly, fourth-century architectural sculpture makes increasing use of shortcuts and is uneven in quality.”

regarded as one of the greatest achievements of late classical sculpture, probably made in the 350s, and today known from many copies.¹⁷

The flourishing art market of the late IV century was fertile for artistic innovators, and the key figure of the period was Lysippos of Sikyon (about 385-310 BC), a master of realism: this is what we can infer from his decision to start a career as a sculptor without a teacher when he heard Eupompus claiming that his model was not an earlier artist but nature itself (Pliny, 34, 61). According to Stewart (1990, p. 186), by the 340s “Lysippos had effectively replaced the Polykleitan school in the Peloponnese, and was in demand all over the Greek world for bronzes on almost every subject imaginable. His versatility in the medium was extraordinary, and together with his ability to make his statues ‘come alive’ through his command of detail, must clearly have been instrumental in his securing commissions from individuals, *póleis*, federal states, and last but not least Philip and Alexander” for whom he will become court sculptor. He was also extremely prolific: according to Pliny, he would have executed 1,500 works in bronze, a number corresponding to the gold coins found by his heirs in his strong-box, each one set apart from the fee received for each statue.

A follower of Lysippos, Chares of Lindos, was responsible for what was probably the most expensive statue of ancient Greece, the “Colossus of Rhodes” dedicated to the sun-god Helios and another wonder of the ancient world. This bronze statue was 32 meters tall, erected in twelve years and paid 300 talents: completed in 293 BC, it was destroyed by an earthquake at the end of the century (Pliny, 35, 41).¹⁸ The price was three times the price of the masterpiece of Polykleitos, though the comparison is not very informative given the peculiar nature and size of colossi and the large amount of bronze needed for them.¹⁹ The competition for similar commissions must have been fierce, since we know from the historian Plutarch (46 - post 119 AD) that Greek *poleis* invited bids for temples and colossal statues and scrutinized the competitors through juries that judged models and sketches (*Moralia*, 498).

Pliny mentions a few followers of Lysippos active in the first decade of the III century BC, and then argues that “art ceased” (*cessavit deinde ars*, Pliny, 34, 52) and was revived only in the middle of the II century. This mysterious statement may simply refer to the end of the Greek literary sources used by Pliny, as the writings of Xenocrates of Sikyon (Pollitt, 1974, p. 27). A different interpretation is that the sequence of artistic innovations had really reached its peak and subsequent art would have only distorted the major achievements of the earlier age in a baroque style or repeated them in a neo-

¹⁷ Athenaios (13, 590) tells us that the model of the naked Aphrodite was the beautiful Phryne, a mistress of Praxiteles (who also received from the artist a statue of “Eros” as a gift). We should remark that marble sculpture was typically painted, and the famous painter Nikias was often collaborating with Praxiteles (the later Alexander Sarcophagus is famous for its retention of polychromy).

¹⁸ We also know the price of 800 talents for the last of the seven wonders of the ancient world, the “Lighthouse of Alexandria”, which was erected in 280 BC, possibly by the architect Sostratus with payment by Ptolemy I (McKenzie, 2007).

¹⁹ A colossus representing “Apollo” by the classical sculptor Kalamis for the town of Apollonia in Thrace was paid 500 talents in the I century BC by Marcus Lucullus, shipped to Rome and set on the Capitol Hill (Pliny, 35, 39). Roman colossi will be even larger and more expensive, as those of Zenodoros in the I century AD, namely the Mercury built in Gallia over ten years at the cost of 1,600 talents and the 35 meter tall colossus of Nero in Rome, dedicated to the Sun after the *damnatio memoriae* of that emperor. While the price of colossi appears out of scale compared to normal sculpture, most of the price change must have been due to the cost of precious metal: when a statue undergoes an increase in size of x times, its new surface area is proportional to x^2 and its new volume is proportional to x^3 .

attic style.²⁰ During this period the central role of Athens declined rapidly, also as the center of the art market (Stewart, 1990, p. 193): “Sculptors now either emigrated to Ionia, Rhodes, Alexandria, and elsewhere, or turned to portraiture in bronze. This was increasingly in demand and very lucrative, as the state scrambled to honor benefactors or to conciliate the powerful, and private clients to cultivate or reward each other, and to promote their own family prestige – an impulse which the banning of conspicuous tombs could only have served to strengthen. Yet the effects of decline could not be hidden for long, and even those sculptors still based in Athens soon became ever more dependent upon overseas commissions.” The most attractive commissions were those of Pergamon, Antioch and Alexandria, but there are no more traces of high payments for the leading artists of the Hellenistic period.²¹

While the size of the art market was expanding well beyond the older circle of Greek *póleis*, most of the artists were refocusing their efforts toward activities that could insure a steady flow of earnings, such as portraits for private commissioners, small statues for domestic decorations (as the terracotta figurines of Tanagra) and others that could be easily commercialized in various final destinations. Ordinary bronze portraits were in increasing demand during the Hellenistic age, and according to Stewart (2019) were normally priced around 3,000 drachms with a profit for the artist of about 2,200 drachms in the IV-III century BC and 2,000 drachms with a profit of 1,350 drachms in the II-I century BC. There was also a widespread demand for group patronage, “ranging from subscription-financed portraits of dignitaries in Athens, Rhodes, Lindos, and elsewhere (at 3,000 drs. a time) to large-scale commissions such as that awarded to Menandros of Athens by the Association of the Poseidoniasts of Berytos (Beirut) in the second-century Delos” (Stewart, 1990, p. 58). Always more workshops were focused on “garden sculptures” which could be stocked and widely commercialized. In 167 BC Delos obtained a duty-free status under the Athenian administration and launched a fully fledged industry of sculptural workshops exporting at the inter-regional level (see Mertens, 2021).

The rise of Rome and its occupation of Greece after the Achean war in the mid II century intensified cultural exchange in a precise direction: as the poet Horace put it, “conquered Greece took captive her savage conqueror and brought her arts into rustic Latium”. The Roman Republic had experienced a rare process in history, characterized by the gradual conquest of regions that were much more advanced from a cultural and artistic point of view, such as Etruria, Magna Graecia, and then parts of Greece, North Africa and Asia. This generated a continuous flow of works of art as military plunder which served part of the demand for public buildings and for the houses of the main patrician families in Rome. Every military victory was followed by a triumphal procession displaying war booties, including statues and paintings which were spread between public and private collections: ancient sources describe many of them, for instance after the battles of Syracuse (211 BC), Tarentum (209

²⁰ The same had happened in architecture after reaching the perfection of the Parthenon, whose style will be repeated in a standardized way for a long time, resisting innovations which will be only exploited by Roman architecture with the diffusion of the arch, the vault and the dome (Lawrence, 1996, p. 215).

²¹ We have epigraphic evidence of cases where sculptors were not paid, as in a decree from third-century Delos, where Telesinos of Athens gave up to the compensation for two statues and was praised with a laurel crown for this, or in a decree from second-century Peloponnese, where the local artist Damaphon of Messene was awarded a variety of privileges after he cancelled debts of 3,846 tetradrachms and 50 mines on old statues and promised a new one free of charge (a tetradrachm was worth four drachmas, therefore the total amount was less than 4 talents). Besides the followers of Praxiteles and Lysippos and the workshop of the Plykles family in Athens, only few other successful artists have left some evidence, including Bryaxis, Phyromachos and Epigonos.

BC), Antiochos (186 BC), Macedonia (194 BC and 148 BC), Ambracia (189 BC), Pydna (168 BC), Cartage (146 BC), Corinth (146 BC), Athens (85 BC) and more. A flow of masterpieces that were never seen before inundated Rome: while this raised the hostility of the conservative elite (notably of Cato the Censor) which condemned a luxury contaminating the severe *mores maiorum*, it certainly started interest in art collecting.

The traffic of artworks from the provinces was not over after war, and continued with regular trade (whose evidence has been often found under the Mediterranean Sea; see Greene, 1986), often under the control of local governors. In the first half of the I century BC an avid plunderer of statues and paintings was Gaius Verres, first legate to the governor of Cilicia and then governor of Sicily. When the Sicilians appealed to the Senate for his misgovernment, the attorney Marcus Tullius Cicero described his conduct in stealing or securing major artworks for small payments.²² The same attorney was a passionate art collector, especially of statues for the decoration of his villas. In his letters to the friend Titus Pomponius Atticus, based in Greece, he repeatedly asked to send original artworks, and in 67 BC he mentioned a payment of HS 20,400 to L. Cincius for some Megarian statues recommended by Atticus (*Ad Atticum*, I, 8, 2). In 61 BC Cicero was engaged in other acquisitions intermediated by the art dealer Damasippos,²³ complaining about the price of some statues and admitting that he was going to switch his interest toward paintings (*Ad Familiares*, VII, 23, 1-3).

Once war booties and regular imports of artworks could not satisfy anymore the demand, Rome started employing foreign artists, mainly Greek ones, to produce copies of ancient statues and decorations for both public and private buildings. According to Stewart (1990), “copyists concentrated in the major access ports of Rome: first around the Bay of Naples, then at Ostia... Importing Greek marble and often using casts supplied from Greece as models, they tended to neglect the vast mass of originals in Rome itself... To be able to please most clients, a copyst needed only to stock a few prime examples of each popular subject... Authorship was a secondary consideration at best”.²⁴ It was mostly slaves, reaching Italy from the newly conquered eastern provinces, and freedmen who were employed in the *officinae* for the mass production of copies of Greek statues (as the one found in Baia, with rests of 400 plaster casts; see Harris, 2015) and, since the II century AD, sarcophagi. In such a contest, quality-enhancing innovations were not the priority. Even Pasiteles, a celebrated Greek sculptor active in Rome during the I century BC, and his pupils Stephanos and Menelaos ventured at most in variations of pre-existing themes. We should remark that this did not prevent Roman sculpture from producing important works in the classical style (as the *Ara Pacis Augustae*) and developing a naturalistic style in portraits (from funerary ones for freedmen to imperial

²² For instance (*In Verrem*, II, IV, 12-14, 70BC), he mentioned the sale to Verres of three statues attributed to Myron (a bronze Heracles), Polykleitos (a bronze of basket carriers) and Praxiteles (a marble Eros) for HS 6,500, of which HS 1,600 for the latter: these prices were artificially low according to Cicero, who mentioned the auction of a bronze statue of no greater size fetching HS 40,000.

²³ We know from Horace (*Satires*, II, 3, 16) that Damasippos owned a garden of statues for sale along the Tiber and could sell them for a hundred thousand sesterces before his business started to decline (possibly due to an excess of false attributions).

²⁴ The importance of decorative arts points to the massive expansion of a middle class demanding (and capable of affording) such forms of art. It is telling that prices for decorative arts were challenging those of figurative arts: Pliny mentions prices of plates in bronze (one by Pytheas sold for HS 40,000) and clay (one priced HS 100,000 and another, for the emperor Vitellius, reaching HS 1,000,000), candlesticks (one paid HS 50,000) and decorated cups (two by Zopyros possibly estimated HS 1,200,000, while Crassus would have paid HS 100,000 for ancient Greek cups).

portraits) and in continuous narrative reliefs on columns and arches (evolving beyond the traditional concept of *mimesis* in art). However, these advances either were built on earlier developments of Hellenistic sculpture or remained occasional results by near anonymous artists (see Kleiner, 1992).

The *Pax Romana* of the first two centuries of the Roman Empire fostered trade across all the provinces, especially of precious objects such as decorative marble and artworks. As the principle of comparative advantage would suggest, this led to the concentration of artistic production in eastern provinces with an old tradition, but there was also a steady flow of migration from these places to Rome and other provinces with large demand (see Russell, 2013, pp. 332-6, on migrant and itinerant carvers). As noticed by the historian Suetonius (69 - post 122 AD), the exploitation of marble quarries at Luna allowed Augustus to turn Rome from a city of brick into one of marble (*Life of Augustus*, 28) and promoted local sculpture, largely by anonymous artisans. As emphasized by Kleiner (1992, p.4) “the names of Roman artists, be they native Italians or, as was more usual, men from Greece or Asia Minor, are rarely recorded. This is probably because Roman artists were of low social status since they came from slave population or from the freedman class and were considered mere artisans. Such was the fate of both the greatest artists of the day who worked in the emperor’s court and of the lowly stonecarvers employed in workshops producing sepulchral reliefs”. Even the Roman emperors, who were spending large resources for the magnificence of Rome, did not appear to care much about artistic quality and novelty in sculpture. According to Cassius Dio (*Historia Romana*, 65, 14, 5) when someone voted to erect to the emperor Vespasian (69-79 AD) a statue with a base costing a million sesterces, he held out his hand and said: “Give me the money; this is its pedestal.” Vespasian was a particularly pragmatic man (who also promoted a realistic style in imperial portraiture), but his approach to art reflects the approach of a large part of the Roman elite, whose roots were based on military rather than cultural interests.

By the II century AD the entire Mediterranean Sea was the stage of an unprecedented trade in statues and sarcophagi,²⁵ directed not only to Italy but to all the provinces of the Roman Empire, especially the most “Romanized” ones, as those of Africa, Spain and Gaul. Temples, forums and baths of most of the towns of the empire were decorated with statues commissioned by public and private patrons, often shipped from workshops based in other places. Part of the production was completed at the destination: most reliefs were sketched before shipping and finalized only at the arrival, to limit risks and to adapt the details to the needs of heterogeneous patrons. The statues could be either in bronze or in marble, and the subjects included gods, emperors and the same donors. While many of these statues were lost or removed over the centuries, we have records of thousands of them from inscriptions left at the bases of the statues around all the provinces of the Empire between the I and the III century BC. In some cases we have also detailed information on the commissions of those statues (Friedlander, 1913; Duncan-Jones, 1982; Drinkwater, 1979; Curchin, 1983): these epigraphic

²⁵ The interest in sarcophagi was promoted by the change of burial practice from cremation to inhumation. The most important workshops were in Rome, Athens and Asia Minor, and the five thousand sarcophagi that survive today are mostly decorated with hanging garlands, mythological subjects, battles and biographical stories. They were not only destined to upper class patrons, but also to freedmen and even slaves (Kleiner, 1992, pp. 256-9).

documents provide the unique source of information on the market for statues in the Roman Empire that we will exploit below.²⁶

By the end of the III century, the Empire entered a period of military and economic crisis, and also the production and trade of statues started to decline, as witnessed by the lack of price records for this period and Late Antiquity (Smith and Ward-Perkins, 2016). This is not due to the lack of comparable (epigraphic or literary) sources, which are still available for this period, and is instead a symptom of an artistic decline: after decades of a mass production of imitative statues and standardized sarcophagi by an industry of anonymous carvers, the reduction of public commissions for major statues or large-scale relief sculpture led to gradually lose knowledge of old techniques and artistic traditions.²⁷

2.3. *The market for paintings in the Greco-Roman world*

We have lost almost all the works of ancient Greek painters, but not the information on them. Pliny mentions about a hundred and forty painters and provides detailed information for a substantial group that can be integrated with other literary sources. Also in this case, the Roman Empire has left behind more paintings, but only few names of original painters.

Pliny starts his history of painting at some point between the end of the VIII century BC and the beginning of the VII century, when the king of Lydia Candaules purchased a painting of the “Battle of the Magnetes” by the ionic artist Boularchos for its weight in gold (Pliny, 35, 55). Such a vague information on the value of the work is probably aimed at stressing that there was already demand for high quality art in those times. The only aid for our visual imagination of early painting derives from drawings on archaic vases, mostly from Corinth and Athens: vase painting was characterized by an embryonic form of competition between the best artists, suggested by the first signatures left by about a hundred authors to promote their own supply.²⁸ Also large scale painters must have been competing to attract commissions by differentiating their production. A first innovator of this period was Cimon of Cleonae, probably active in the VI century BC, who introduced foreshortenings (*katagraphia*): according to Aelian (175 - 235 AD), he “perfected the Art of Painting, which until then was but rude, and very indifferent, and as it were in its infancy. For which reason he also received a greater reward than the painters that were before” (*Varia Historia*, 8.8). Such innovations were rapidly spreading around Greek *póleis* and their colonies (an eco can be found in various Etruscan tombs).

The subsequent process of artistic innovations brought to the great masters of the V and IV centuries BC, for which we have more information. The first important artist was Polygnotus (about 500-440 BC), who belonged to a family of painters active in the island of Thasos, and probably moved to

²⁶ We do not have similar information for sarcophagi: we only know the price of a limestone and undecorated sarcophagus from Salona in Dalmatia, probably made in the late III century AD, and sold for about 600 sesterces (Russell, 2013, p. 29).

²⁷ This was the twilight of the pagan world, before the new Christian world (formalized with the Edict of Milan in 313 AD) started to build its own artistic traditions.

²⁸ More than a thousand signatures have been found on Attic vases between the VI and V century BC (see Seaman and Schutz, 2017). Also signatures by other artists originated in the VI century and it has been emphasized that the practice started in Attica right after reforms by Solon had given a boost to artisanal activities.

Athens in the third decade of the V century BC, when many other artists and intellectuals were attracted by the leading town of the Delian League. His first known commission was for a monument built after the battle of Plataea (479 BC) where the alliance of Greek *póleis* defeated the Persians. The project was financed with 80 talents for the construction of a sanctuary of Athena, a huge statue by Phidias, and paintings by Polygnotus and Onasias: most of the spending was certainly destined to the construction works and to the statue by the leading sculptor. After other public commissions for Athens, Polygnotus became a key figure in the circle of the statesman Kimon and around 470/460 BC he was commissioned the decoration of a major portico in the *agorà* of Athens, the so-called *Stoà Poikile* (literally the painted portico) together with two local painters, Mikon and Panaenus, the brother of Phidias. The panel by Polygnotus represented the sack of Troy, or “Ilioupersis”, while Mikon painted a panel of equal size representing the battle of Theseus and the Athenians with the Amazons, or “Amazonomachiai”. It has been suggested that the size of each panel was about 20 square meters and the work of Polygnotus contained up to twenty figures displayed along two rows, as typical also of contemporary vase painting: see Roscino (2010), whose schematic reconstruction of the sack of Troy presents thirteen standing figures. Pliny tells us that Polygnotus was not paid for this panel, while his partners Mikon and Panaenus were regularly paid for a third panel representing the “Battle of Marathon” since, according to Sopatros the Rethor (in the “*Diairesis Zētēmatōn*” of the IV century AD), Mikon was also fined thirty mines for depicting Persians in the foreground taller than the Greeks, probably with the simple aim of respecting intuitive rules of perspective. However, in exchange for his work Polygnotus obtained the Athenian citizenship, which was extremely valuable because it gave the right to own land in Attica, avoid the taxes on metics (foreign residents) and access political institutions. He was also awarded free hospitality all over Greece by the amphictyonic league of Greek towns based in Delphi. And in the town of the Delphic Oracle, around 466 BC he painted a cycle in the Lesche of the Knidians, a sort of club-house of the rich in front of the sanctuary of Apollo (Pliny, 35, 59). The later description of this cycle by Pausanias (a geographer of the II century AD) suggests that this was a wider composition on multiple walls, including another version of the “Ilioupersis” and a representation of the visit of Odysseus to Hades or the “Nekyomanteia”, both of which were richer of figures than the earlier versions (traditional reconstructions reported in Roscino, 2010, count more than sixty figures in each composition), and probably had been well paid by the rich Knidians after the battle of the Eurymedon (467 BC) which marked the final defeat of the Persians. The anecdote suggests a fact of crucial importance at the beginning of the classical age: various Greek city-states demanded works by the main artists, and were ready to compete for their services. This competition must have gradually increased the prestige of the painters, the payments they could obtain and their incentives to create better artworks than the rivals.²⁹ Such a mechanism was typically Greek: a basic competitive channel could not emerge in other ancient civilizations where a unique centralized political power was allocating artistic activities. And it led to conceptual and technical innovations, such as new methods to reproduce shadows and perspective or the same introduction of easel painting on panels.³⁰

²⁹ Anecdotal evidence on the competition between painters emerges also from contests: for this period we know of a contest between the painters Panaenus and Timagoras. Contests were also common in lyrics and drama, as in the Dionysia festivals. And we have anecdotes about the protection of intellectual property rights on philosophical writing and even cooking to foster creativity (Seaman and Schultz, 2017, p. 5-6).

³⁰ Apollodorus of Athens, active in the early V century, introduced the new technique of *skiagraphia* to better reproduce shadows. He was probably one of the first artists to specialize in easel paintings on panel, called *pinakes*, and many followers adopted and extended some of his innovations. For instance, in the mid V century, Agatharchos of Samos

The next major painter was Zeuxis of Heraclea, probably the town of Heraclea Minoa in Sicily (Gallo, 1861; Moreno, 1987). He was active between 430 BC and 394 BC and focused most of his activity on easel paintings. Apparently, Zeuxis earned so much money from his profession that he was used to parade around Olympia with his name decorated in gold on his cloak (Pliny, 35, 62). He even started to give away his works for free because he claimed there was no high enough price for them, and in particular he gave an “Alcmena” as a gift to the rich town of Akragas in Sicily and a “Pan” as a gift to Archelaus I, king of Macedon from 413 to 399 BC. These facts mentioned by Pliny are quite telling. First, of all, the production of easel paintings on panels is ideal to develop a secondary art market, which was probably expanding in this period. Second, the fact that Zeuxis became rich from his activity suggests that there was not any negative perception of producing art for money and that paintings were in high demand, which may have contributed to foster the innovations of this period as well as competition between painters; the rival Apollodorus would have accused Zeuxis of stealing his original techniques, and anecdotes on competition between artists abound. Third, Zeuxis was advertising his work with the likely purpose of reaching a double role as court painter and entrepreneur producing for various patrons. This was not in vain, since he received commissions from Ephesus and city-states in Sicily. According to Cicero (*De Inventione*, 2, 1, 1), he was also hired by the rich town of Kroton to decorate a temple of Juno: people were charged to see it and Zeuxis made a lot of money from this sort of art exhibition. At the end of his life Archelaus I brought him at his court in Pella (together with other artists and poets, including Euripides), and there Zeuxis painted for the palace of the king. The rivalry between Zeuxis and the next leading painter, Parrhasius of Ephesus (active in the early IV century BC) was the subject of a famous contest based on the earliest mention of a *trompe-l'œil* painting. Zeuxis had painted grapes so well that birds were fooled and flew down to them. Then, Parrhasius challenged Zeuxis bringing him to his workshop to show a curtain on a panel. Zeuxis was so sure of winning the contest that asked Parrhasius to draw aside the curtain and show the painting. But realizing that the painting was actually reproducing the curtain, Zeuxis declared the victory of Parrhasius, because he had deceived birds while the rival had deceived a painter.³¹ If this anecdote suggests something, it is not the ability of these artists, but the crucial role of competition between artists at reproducing nature (*mimesis*), which was becoming the rule of the game in the profession.

The main artistic schools of the mid IV century were based in Athens and Sikyon and aimed at strengthening realism. Famous painters active in this period included Pausias of Sikyon (active around 380-330 BC) often engaged in small still life paintings and the first to decorate the vaults of roofs, Kydias from Kythnos, active in the same period (since he was mentioned as a contemporary of

developed the *skenographia*, which was aimed at reproducing a realistic perspective. Similar techniques were probably used for the scenography of tragedies by Aeschylus and were then exploited in other representations of what was becoming the golden age of the classical Greek drama (see Baumol, 1971). Rules of perspective were refined by Democritus by the end of the century and probably formalized by the school of Euclid at the end of the IV century BC (McKenzie, 2007). While this possibility is supported by later accounts of the Roman architect Vitruvius (*De Architectura*, 7, 11), there is no definitive evidence (either from documents or surviving paintings) that the technique corresponded to the modern rules of perspective with a single vanishing point.

³¹ According to Athenaeus of Naucratis (*Deipnosophistae*, 12, 543), Parrhasius matched Zeuxis in vanity: he used a golden crown, a golden stick and sandals with golden clasps, and once he set a self-portrait as a Mercury in a temple. Defeated by Timanthes of Cythnos in a contest for depicting Ajax, he claimed he was not worried for himself but for Ajax, who was defeated a second time through such a verdict.

Euphranor, who flourished in 364-361 BC) and probably engaged in landscape and mythological paintings, and Nicomachus of Thebes, active in 360-320 BC and the likely author of the fresco of the “Abduction of Persephone” for the Tomb of Philip II of Macedon, executed at the death of the king in 336 BC, and still visible, in Vergina. The same Nichomachus was commissioned a portrait of the king Antipater, regent of Alexander’s Empire in 320, for a high fee, and executed it in forty days, which induced the king to complain. The answer of the painter was that he did not execute it in forty days but in forty years of a career in which he learnt how to paint quickly whenever he wanted (Moreno, 1987, p. 106), exhibiting awareness of the value of the artistic capital accumulated over time and also of the market power associated with it.³² His followers included the son Aristeides of Thebes, who was, according to Pliny, one of the first artists able to express the feelings of human beings and their perturbations (35, 98) and Philoxenus of Eretria, a history painter who was commissioned a “Battle with the Persians” by the king Cassander of Macedonia. Unknown is instead the author of the best fresco left from this period, found in a macedonian tomb of Agios Athanasios, with portraits of two soldiers, a banquet scene and a procession of soldiers.

The literary sources agree that the perfection of painting was reached in the second half of the IV century by Nicomachus, Aetion, Melanthius and Apelles, whose works could be sold individually for the treasures of whole cities (Pliny, 35, 32). In particular, Apelles of Colophon in Asia Minor was recognized as the most acclaimed artist. Born around 375 BC, he studied in Ephesus and Sikyon before moving to the court of Philip II where he became the painter of Alexander the Great, who apparently accorded to Apelles, the sculptor Lysippos and the gemcutter Pyrgoteles the exclusive right to depict him in each respective medium. Once again, the existence of competition between painters is presented by the sources through anecdotes, as those between Apelles and Protogenes of Caunus, active in the free island of Rhodes around 330-290 BC. One reported by Pliny was about a challenge to depict the most subtle line, creating an early abstract painting (that was later brought to Rome). Another is reported Plutarch in the *Life of Demetrios* (22, 2-3): “Protogenes worked on the painting [of the “Story of Ialysos” for the Rhodians] for seven years. Further, they say that when Apelles saw the work he was so astounded that his voice left him; but later he said that although the labor was great and the work was marvellous, it did not have his own *charis* [beauty], through which the figures painted by him touched heaven itself.” Besides working at the court of Alexander, Apelles worked also in Alexandria at the court of Ptolemy I, ruler of Egypt in 305/4-282 BC and an avid collector who will also try to purchase works by Nikias of Athens. Such a dynamic market was not without risk for the artists, and the same Apelles ended up victim of a conspiracy orchestrated by the rival painter Antiphilos in Alexandria.³³

We do not have much information on painters during the Hellenistic period, except for few names, such as Kratinos and Nealkes active in the III century, and their respective daughters Eirene and Aristarete possibly active in the early II century. The conquests of Alexander and the subsequent

³² Further evidence on the link between art prices and market conditions is provided by Pliny (35, 145), who notices the curious fact that the paintings left unfinished at the death of the artists have a higher value. This is the first statement of the well-known death effect on art prices (Ekelund *et al.*, 2000).

³³ Another example of the risks associated with art trade comes from the first half of the IV century. According to Plutarch (*Life of Pelopidas*, 25, 5) the painter Androkydes of Cyzicus had a commission from the Thebes “to paint another battle and was in the process of finishing the work at Thebes. However, when the city revolted and the war broke out, and the painting was left not quite finished, the Thebans confiscated it for themselves.”

developments of the hellenistic kingdoms expanded the art market for the leading artists to an international dimension. Many artists started to produce for other regions and migrate where there was demand. Pliny emphasizes the strength of this phenomenon mentioning the migration of a female painter, Iaia of Cyzicus, who moved alone to Rome in the early I century BC: she was faster than any other portraitist and so good that her prices could overcome those of the most famous portraitists of her period, such as Sopolis and Dionysios (also eastern artists), whose panels filled the best art galleries (Pliny, 35, 147-148).

Pliny laments scarce developments of painting in Rome, and once again the motivations can be read between the lines. For the early Empire, Pliny mentions only one local painter who reached fame in his own times: “Recently there was the serious and severe, but at the same time overly florid painter Famulus. By his hand there was a Minerva which continued to face the viewer no matter what angle he looked at it. He used to paint for only a few hours a day, but this was done with great gravity, since he always wore a toga, even when he was in the midst of his painter’s equipment. The *Domus Aurea* was the prison for his artistry, and for that reason there are not many other examples of his work extant” (Pliny, 35, 120). We do not know anything else from other sources about this artist active under Nero (who built the *Domus Aurea* between 64 and 68 AD). His name, Famulus, means ‘servant’ or ‘slave’ in latin, suggesting that he was a freedman, and that his peculiar attitudes may have been an attempt to emphasize his new status and reputation (Stewart, 2008). However, there is something more that Pliny may be telling us with this unusual artistic biography. The most important Roman artist of the time does not appear under the pressure of high demand by competing patrons, and just one work by him is mentioned before he was employed by Nero for the rest of his life in a single enterprise. By saying that Famulus was painting few hours a day with a toga, Pliny may have alluded to the fact that he was simply directing the works, which were mainly executed by assistants, possibly slaves. This supports the presumption that painting was regarded as a relatively minor form of decoration in imperial Rome, delegated to the artisanal activity of slaves and freedmen of foreign origins, with rare opportunities for the emergence of a competition between free artists that could foster artistic innovations. A related point had been made by Cicero in his *Tusculanae disputationes* (I, 2, 4) with his famous claim that Romans would have had their Polykleitos and Parrhasius if they had considered sculpture and painting as respectable professions, because honour nourishes the arts (“*honos alit artes*”). Pliny confirms elsewhere this idea noticing that in the Roman Empire “painting was not looked upon as a suitable occupation for respectable hands” (Pliny, 35, 20).

Pliny died in 79 AD in the attempt of rescuing a friend from the dramatic eruption of the Vesuvius which buried Pompeii. Centuries later, the rests of the town will be rediscovered, well preserved under the ashes. The subsequent excavations provided a unique snapshot of the paintings and the artistic decorations of its domestic environments, accumulated between the II century BC and the I century AD, frozen as they were at the moment Pompeii was buried. This and other rests from the nearby towns of Hercolaneum and Stabiae, together with comparable findings in Rome, Ephesus, and other parts of the Empire have made it possible to reconstruct the broad development of Roman painting in this period (Ling, 1991). This appears largely inspired by contemporary Greek painting, and ranges between a first “structural” style that was mainly reproducing expensive marble decorations in the II century BC, a second “architectonical” style of the mid I century BC occasionally including figurative frescoes, a third “ornamental” and classicizing style which was popular in the

Augustan age, and a “fantastic” fourth style developed in the mid I century AD and often including framed panel paintings in the wall decoration.

There is no evidence on the price of paintings in this period, but we can infer some information on the demand of paintings from a broader analysis on the artistic decorations in Pompeii, by far the most extensive left from imperial Rome. Flohr (2019) has analyzed the distribution of excavated houses by size and type of artworks.³⁴ The most common decoration was represented by wall paintings, which were present in a majority of houses. Instead, the most exclusive decoration was represented by fine mosaics in *opus vermiculatum*, which were found only in fifteen houses and three villas mostly of the elite, and with a skewed distribution also in these buildings (since ten mosaics were found only in the *House of the Faun*, representing a large majority of the thirty five mosaics found in the entire town, and ten houses had just one mosaic each). This suggests that painting represented a rather popular and cheap form of art decoration, demanded also by the middle class and supplied at the local level in a town of medium size such as Pompeii. Instead, mosaics were rarer and probably purchased from other artistic centers or completed *in situ* (on the basis of imported drawings) by workers specialized in this mechanical task.³⁵

3. The organization of art production in classical Greece and the Roman Empire

Art production in ancient Greece was organized by master artists through workshops. There was a system of apprenticeship for most craftsmen including the artists, and we can reconstruct a network of masters and scholars linking most of the sculptors and painters mentioned by ancient sources.³⁶ Pliny explicitly mentions the case of the Macedonian painter Pamphilos of Amphipolis (active between 390 BC and 340 BC), who was paid by his pupils, including Apelles, Pausias and Melanthis, 500 drachms a year to provide basic lessons of paintings, arithmetic and geometry, without which, he claimed, no one could become a perfect painter (Pliny, 35, 76).

As stressed by Stewart (1990, p. 56) the sculptors “were entrepreneurs, operating like other crafts from a shop (*ergasterion*) that could be as large or as small, as fixed or as mobile, as occasion and demand required. *Techné*, as taught by the master-pupil system provided a solid grounding and points of future reference, but never precluded individual enterprise. In fact, the competitiveness of Greek society tended to encourage it.” And a similar argument would apply to painters, engaged in an itinerant life across *póleis* to provide their services for the major public commissions.³⁷ In case of complex projects, there was a real team of master artists in collaboration, as was the case for Phidias directing the decorations of the Parthenon and then erecting the statue of Zeus at Olympia, Polygnotus

³⁴ Computing a weighted average of relative size and number of rooms for 509 houses, Flohr (2019) emphasizes a fat tail distribution with few exceptionally large houses (as the *House of the Faun* which was 2,809 m² large or the *House of Fabius Rufus* with 78 rooms) and some suburban villas of the elite, many medium-sized houses of a sub-elite and a majority of small houses (with less than ten rooms) of middling groups.

³⁵ In the following centuries mosaics will spread as an important form of decoration throughout the entire Roman Empire. Later on, they will raise from floors to walls and vaults, where they will be inherited by Christian art.

³⁶ The historical account appears consistent with a deep impact exerted by the masters on style and productivity of their scholars as found in more recent periods (see Borowiecki, 2022).

³⁷ While classical Greek sculpture and painting were mostly directed at public commissions, there was a parallel demand from the middle class of decorative art, which did generate mass production (and export) of painted vases (see Seaman and Schutz, 2017).

painting with Mikon and Panaenus in Athens, or Skopas of Paros sharing the decorations of the Mausoleum of Halikarnassos with Leochares, Bryaxis and Timotheos.

All the known masters of classical Greece were freeborn (Pliny, 35, 77) and, actually, painters such as Zeuxis, Parrhasius and Apelles were believed to own slaves (Seaman and Schutz, 2017, p. 17). As in other artisanal activities, slaves could be employed, but their role must have been confined to minor tasks, as was possibly the case in Phidias' workshops. The allocation of resources was already standardized: as noticed by Bresson (2016, p. 189) "the construction of sanctuaries in the Classical and Hellenistic periods (at Epidauros, Delphi, Eleusis, the Parthenon, Delos) show that the mode of remuneration was a function of the type of activity involved. Those who provided more specialized work were paid by the piece, whereas unskilled workers were paid by the day." In the works for the Erechtheion on the acropolis of Athens carpenters and sawyers were paid by day, masons and (encaustic) painters were paid by measure, carpenters, sculptors, (wood) painters and woodcarvers by piece and architects by salary (Austin and Vidal-Naquet, 1977), and we can guess that the contractual option was selected to optimize the incentives of the workers.

In the Roman Empire guilds were active in various fields (Temin, 2017, p. 108-10) but there is no evidence that they controlled prices or that they were present in artistic professions. The organization of art production was based on workshops which were mostly composed by freedmen and slaves (Stewart, 2008; Harris, 2015). There is evidence of a workshop of mosaicists, including four freedmen, in the Albani Hills near Rome, and of a workshop of painters in the Castricio street in Pompeii (Harris, 2015). Flohr (2019) has estimated the demand of paintings analyzing the distribution of almost a thousand pictures found in about two hundred buildings in Pompeii: in three-quarters of the cases the decoration was limited to one or two rooms of the house, while only two houses have more than ten rooms with paintings. Taking into account lost works from destroyed upper floors and unexcavated parts of Pompeii, Flohr (2019) estimates that the demand of panel paintings in Pompeii could have been of about a hundred per year, which would justify the activity of a local workshop or at most two competing workshops in the neighborhood (and the epigraphic evidence attests the activity of painters in nearby Puteoli and Surrentum). Clearly, a city of a million inhabitants as Rome must have hosted many more workshops, employing many freedmen and slaves in standardized decorations which were demanded not only by patricians, but also by the middle class. And the same would have happened in many other towns of the provinces of the Empire. We have also evidence of workshops of sculptors and mosaicists active across the Roman Empire, often shipping statues and drawings for mosaics through the Mediterranean sea, as was the case for the sculptors based in Aphrodisias in Asia Minor. Their works have been found in public and residential buildings spread around all the Roman Empire.

We have some information on the ordinary activity of the artists, their costs and their contractual agreements. Bronze statues were commissioned at prices that internalized the cost of metal, but leaving space for adjustments: classical Greek sculptors used alloys with mere traces of lead and abundance of tin, which was more expensive, while later Hellenistic and Roman artists often decreased the percentage of tin, used thinner walls to reduce the amount of metal used and introduced other cost-saving techniques.³⁸ Paintings were originally based on few colours and classical Greek

³⁸ The cost-saving techniques introduced in the late Hellenistic age are described by Stewart (2019): "substituting lead for tin would have helped, since it was far cheaper and easier to obtain, but so too would using recycled bronze scrap,

painters gradually introduced new varieties of colours; instead Roman painters introduced cheaper versions of the most expensive colours (Grimaldi, 2022).³⁹ Vitruvius and Pliny inform us that the patrons were usually paying for expensive colours, which were the so-called “florid” pigments, while the painters were responsible for the cheaper “dry” pigments. Nevertheless, more flexible arrangements were also possible: Ling (1991, p. 217) mentions a Greco-Egyptian papyrus of 255 BC where a painter proposed a price of 30 drachmae excluding costs or, in alternative, a price of 53 drachmae including costs for the same work: we do not know what was the final choice of the patron, but basic principles of contract theory suggest that incentives to deliver high quality works would have been stronger in the former case and incentives to reduce costs would have been stronger in the latter.

Painting techniques of the Greco-Roman world included secco and fresco painting, tempera and encaustic (hot wax) painting. Easel paintings were typically executed by a single master in the workshop. Instead, wall paintings were usually executed on the spot by a team, which in the Roman world included an organizer of the works defined as *pictor et praepositus pictorum*, a leading painter for the main figurative works named *pictor imaginarius*, a painter specialized in landscapes and decorations named *pictor parietarius*, a plasterer and assistants. While Greek art developed a production of easel paintings also for the most exclusive environments, which fostered by its nature the development of a secondary art trade, Roman painting was almost exclusively wall-painting carried out on plaster and covering the entire walls of private houses, which prevented the development of a secondary market.⁴⁰ Moreover, the best painters were paid per piece in Greece, while payments per day were more common in Roman times: the difference is again crucial, since payment per piece tends to incentivize quality and innovation, while payment per day tends to incentivize cost-saving techniques and repetitive tasks.

Since ancient Greece, commissions were probably based on contractual agreements with guarantors for the artists. The advanced development of civil law in Roman times makes it likely that artists and patrons stipulated effective contracts of *locatio operis faciendi* setting wages, deadlines and penalties (Ling, 1991, p. 217). We also have interesting information on the relative earnings of painters in a late period, because the Edict of Diocletian (301 AD) set wage limits of 600 sesterces per day for a *pictor imaginarius* and 300 sesterces per day for a *pictor parietarius*. The purpose of the price regulation was to stop the hyperinflation, therefore the absolute amount of these wages does not provide information on wages in earlier centuries, but the relative compensations are interesting: these wages were comparable to those of a mosaicist (*musaearius*) with 240 sesterces per day, or of a floor

speeding up production, replacing profit-sharing free workers with slaves, taking on more commissions, and achieving economies of scale.”

³⁹ We have accurate information on the price of the main colours at the time of Pliny (Ling, 1991, p. 209). Yellow did cost between 1.5 to 8 sesterces per pound, red from Sinop (in Pontus) between 2 and 8 sesterces (but higher quality cinnabar, used for instance in Pompeii in the masterpieces of the *Villa of the Mysteries*, could reach 280 sesterces), indigo between 28 and 80 sesterces, blue between 32 sesterces (for the standard Egyptian pigment) and 44 sesterces (for a higher quality version produced by the business man Vestorius in Puteoli), white around 33 sesterces and purple 120 sesterces. The most expensive colour (besides gold leaf) was azurite with 300 sesterces per pound, but at some point a lower quality from Spain was commercialized for only 48 sesterces per pound: this cost-saving innovation reduced substantially the average cost of paintings.

⁴⁰ The rests of Pompeii and Herculanaeum show that even the rare panel paintings, on wood or sometimes marble (as the “Girls playing knuckles” signed by Alexandros of Athens), were prepared mainly to be inserted within larger wall paintings.

mosaicist (*tessellarius*) with 200 sesterces, as for clay modellers, blacksmiths and bakers, while farm workers could earn 100 sesterces per day. Artists were not employed full time, therefore this comparison suggests that their total earnings were not very different from other artisans active in repetitive tasks. The commodization of painting and the wide supply of freedmen and slaves for this purpose around the Roman Empire reduced artists to anonymous artisans. Again, this limited incentives to invest in quality-enhancing innovations, and fostered cost-saving innovations for mass production.

Classical Greek art was largely focused on idealized mythological and historical subjects. The Hellenistic art started to diversify the supply toward other subjects, but it was Roman art that exploited all the opportunities of product differentiation, in particular in painting (see the Appendix). Large figurative paintings, called “megalographic paintings”, were commissioned by temples and other public buildings in ancient Greece and the tradition continued in Rome, also for domestic decorations and largely through replicas of classical compositions. Beside this, Roman art developed further the specialization in the minor genres, from portraits (realistic and also for the lower class, as was the case in sculpture), to landscapes (including cityscapes, marine and harbour views, and more), genre paintings (including scenes of daily life as well as burlesque and erotic subjects) and still life paintings (including fruits, flowers, birds, fishes, dead animals, writing tools and other *trompe-l'œil* subjects). As in other subsequent periods of art history (see Montias, 2002, Etro *et al.*, 2015), specialization in genres and also in particular subjects became an efficient way of allocating work within workshops generating scale economies in repetitive tasks.

The economic and social background of the master artists was different between classical Greece and the Roman Empire. In Greece it was associated with the middle class of free citizens, as shown by the mobility of the master artists across city-states and their occasional elections to priesthoods and magistracies. After describing the school of Pamphilos, Pliny clarifies that only freeborn had access to drawing lessons in classical Greece, which would explain why neither in painting nor in statuary are there any celebrated works by artists who had been slaves (Pliny, 35, 77). We have also evidence that famous artists were close with (and possibly assimilated to) intellectuals, and they often interacted with the elite. Polygnotus was the lover of the sister of the Athenian statesman Kimon, Phidias was a good friend of Pericles and the philosopher Anaxagoras, and Praxiteles’s family married into the Athenian aristocracy. Many artists wrote treatises on art theory and practice. Parrhasius mingled in Socratic circles and the same Socrates belonged to a family of sculptors and had been probably trained in the art. Ironically, speaking in the dialogues of Plato (as the *Republic* written around 380 BC), Socrates excluded the arts from the ideal State because they just involve imitation (*mimesis*) of nature and therefore are “images of images” that are twice removed from reality. However, the wide space dedicated by Plato to art in his writings suggests that he was not considering it as any other craftsmanship. Aristotle moved to the court of Philip II of Macedon in 343 BC to tutor the son Alexander, and there he must have been in close contact with leading artists such as Lysippos and Apelles, who were treated as peers by the same Alexander.⁴¹ Indeed, Aristotle had a much more positive view of the arts in his *Poetics* written around 335 BC at the time of his return to Athens. We should remark that against the primitivist view of ancient artists as manual workers, there is a

⁴¹ According to Pliny (35, 85), when Alexander was improperly talking of paintings in the workshop of Apelles, the latter was friendly recommending him to shut up, because he would get laughed at by the kids who were grinding the colours.

modernist view that assimilates the status of the main ones, especially the painters, to the status of Renaissance artists: while the debate is open (Tanner, 2000), the two views are not in contrast if it was professional success that could improve the status of Greek artists.

The social status of the artists changed in the Roman world.⁴² The negative connotation associated with sculpture was a concrete burden for centuries, since Plutarch claimed that no noble young, upon seeing the Zeus at Olympia or the Hera at Argos would desire to be either a Phidias or a Polykleitos, and Lucian was expressing a similar concept in the middle of the II century AD. As mentioned, most of the professional artists active in Italy appear to have been freedmen or slaves, and in most cases they had Greek (or in any case eastern) origins. Most of the tombs of artists in Italy refer to freedmen or poor people, and important families had slaves who were specifically employed in services concerning handicraft and painting (*Digest*, XII, 6, 26, 12) for the benefit of their patrons (Becatti, 1951, pp. 38-41, 263). Nobles and intellectuals could occasionally paint, but only as amateurs and not as professional artists: the patrician Fabius Pictor became famous in 304 BC for decorating the temple of Health in Rome, the poet Pacuvius was celebrated for decorating the temple of Hercules in the II century BC, and even emperors such as Nero, Hadrian, Marcus Aurelius and Alexander Severus practiced painting. But the workshops were populated by anonymous artisans employed by entrepreneurs who were commercializing their works in the open market.

The contrast between classical Greek artists moving where patrons demanded their particular artworks and artists of the Roman world producing anonymous works to be traded in the open market is particularly clear in sculpture. And a lively evidence comes from a novel written by Philostratus around 238 AD for Julia Domna,⁴³ about the *Life of Apollonius of Tyana*, a philosopher of the I century AD:

“When [Apollonius] descended to the Piraeus, he found a ship riding there with its sails set, just about to start for Ionia; but the owner would not allow him to embark, for he wished to go on a private cruise. Apollonius asked him what his freight consisted of. ‘Of gods,’ he replied, ‘whose images I am exporting to Ionia, some made of gold and stone, and others of ivory and gold.’ ‘And are you going to dedicate them or what?’ ‘I am going to sell them,’ he replied, ‘to those who desire to dedicate them.’ ‘Then you are afraid, my most excellent man, lest we should steal your images on board ship?’ ‘I am not afraid of that,’ he answered, ‘but I do not think it proper that they should have to share the voyage with so many people and be defiled by such bad company as you get on board ship.’ ‘And may I remind you, most worthy man,’ answered Apollonius, ‘for you appear to me to be an Athenian, that on the ships which your countrymen employed against the barbarians, although they were full of a disorderly naval crowd, the gods embarked along with them, yet had no suspicion of being polluted thereby; you however in your gross ignorance drive men who are lovers of wisdom out of your ship, in whose company as in that of none others the gods delight, and this although you are trafficking in the gods? But *the image-makers of old behaved not in this way, nor did they go round the cities selling their gods. All they did was to export their own hands and their tools for working stone and ivory; others*

⁴² It should be noticed that the scarcity of source material for the Hellenistic era and the disappearance of notable artists in the account of Pliny and other historians suggest that already in that transitional period there must have been a decline in the social status of artists compared to the classical era.

⁴³ Wife of Septimius Severus and mother of Caracalla, Julia Domna was a leading figure of the time and probably a patron of the official portraitist of the Severans, known as the Caracalla Master, who developed major psychological portraits (Kleiner, 1992).

*provided the raw materials, while they plied their handicraft in the temples themselves; but you are leading the gods into harbors and market places [...] that is a horrible commerce."*⁴⁴

We have emphasized major differences between art production and innovation in classical Greece and during the Roman Empire. While these periods had much in common in terms of cultural values and socio-economic organization, it is also clear that multiple factors may have shaped the different evolution of artistic creativity, and an empirical analysis cannot identify the role of all these factors, let alone the causal components, with the limited data available from ancient art markets. Our more modest goal is therefore to emphasize a major structural difference between art markets in classical Greece and the Roman Empire, advance a plausible mechanism through which this difference may have affected the paths of artistic evolution, and verify whether such a mechanism is consistent with the evidence on art prices in these periods.

The structural difference we want to emphasize is about the size of the relevant markets, and the mechanism is about the kind of innovations that different market sizes could promote. Artists in classical Greece could serve the demand of a handful of rival city-states whose patrons were directly competing with each other to attract the best works within a relatively small region around the Aegean Sea. Instead, the workshops of the Roman Empire could serve the demand of an anonymous mass market including any province of the Empire around the Mediterranean Sea, by either shipping their products or migrating where there was more demand. This created different incentives for the artists to invest time and effort in quality-enhancing product innovations as opposed to cost-reducing process innovations. Competition between few rival patrons in classical Greece fostered investments in product innovations (new techniques and novel ways to create illusionistic painted and sculpted images), while competition between workshops to gain scale in the open market of the Roman Empire fostered process innovations (cost reducing techniques, employment of slaves, copying and product differentiation). In a sense, the intermediate Hellenistic world was the *trait d'union* between classical Greece and the Roman Empire, and was characterized by an expansion of the size of the market and a gradual emergence of workshops focused on vast production for wide commercialization.

Different empirical predictions emerge for our two main periods. As we have emphasized, the rich communities of the Greek *póleis* competed to obtain artworks of high quality, which fostered a constant entry of new artists and, most of all, competition for the development of a series of artistic innovations. As pointed out by Stewart (2019), “competing for commissions would ensure that each sculptor would find his own level, and at that level the market (or at least a slice of it) would be his, all else being equal. It is here then, that attainments and compensation perhaps coincided, as expertise, innovation, and even (on occasion) sheer brilliance secured their proper reward in both monetary terms and in other, less concrete ways, namely, self-esteem and prestige.” While public and (major) private commissioners were outbidding each other to attract the best artists and obtain works of higher quality, new heights of artistic creativity were reached and the market value of the masterpieces should have increased over time. Our empirical analysis in Section 4 verifies this hypothesis focusing on major paintings by top artists for leading commissions in classical Greece, on which we have records between the V century BC and the beginning of the III century BC. Similar conditions will

⁴⁴ Translation from Philostratus, 2005, *Life of Apollonius of Tyana*, V, 20, Cambridge: Harvard University Press. Emphasis added.

appear in later periods of art history, featuring increasing art prices and a steady flow of quality-enhancing innovations, as notably during Renaissance Italy.

The Roman Empire featured a much larger and integrated economy where all the provinces around the Mediterranean Sea were connected by safe maritime trade. The demand of artworks derived essentially from all the provinces in spite of their heterogeneity in wealth and traditions, and this promoted competition to serve this demand by shipping works or directly migrating where the works were needed. As pointed out by Rostovtzeff (1957, p. 177-8) for more general artisanal activities, “the purchasing power of the country population and the lower classes of the city residents was very small. But their numbers were large. The existence of such conditions was bound to give rise to mass production and factory work... This forced large shops to lower the quality of their products: they made them still cheaper and naturally more standardized and lifeless.” Cost-saving investments for a mass production were more profitable in a large market than investments in quality-enhancing innovations, and this applied also to art production, or at least the part of it that was destined to the open market. This should have led the market value of traded artworks to be either stable or decreasing over time as a consequence of efficiencies in production. Most of all, the prices for similar artworks should have been largely equalized across the different provinces of the Empire, otherwise art trade or migration of artists would have eliminated remaining price differentials. Our empirical analysis in Section 5 verifies these hypotheses on statues commissioned between the I and the III century AD in towns distributed across the provinces of the Roman Empire. Similar conditions will appear in other periods of art history, featuring stable or decreasing art prices and a continuous process of entry of artists engaged in product differentiation and cost-saving innovations, as in the Dutch golden age.⁴⁵

4. Evidence on the price of paintings of classical Greece

The earliest records on commissions of paintings in ancient Greece concern the primary market. We already mentioned works depicting episodes from the *Iliad* and an Amazon battle in the *Stoà Poikile* of Athens around 470/460 BC. While the first one by Polygnotus was not paid, in spite of additional benefits received by the author, we know that Mikon was fined half a talent for depicting the Persians larger than the Greeks: assuming that the composition of the battle was equally divided between the two armies and that the punishment was proportional to the original payment, it does not seem unreasonable to conjecture that a talent could have been the price initially agreed for the entire composition. This would also resonate well with the order of magnitude of the compensation received by Polygnotus for his earlier commission after the battle of Platea.

Pliny mentioned two paintings sent by Zeuxis as gifts to the town of Akragas and to the king of Macedon, which we can tentatively date around 410 BC. Also in this case, the artist was probably looking for a subsequent return, which did arrive. According to Aelian (*Varia Historia*, 14.17; see Tanner, 2000), the painter went to the Macedonian court of Archelaus I for a decoration of his palace at Pella and was paid 400 mines for a work, the first clear record for the payment of a painting in history. This could be tentatively dated around 400 BC, given the information by Pliny on when

⁴⁵ Remarkably, a broader parallel between the economy of the Roman Empire and XVII century Netherlands is already made in Temin (2017).

the painter reached his acme. The price corresponded to about 6.6 talents, and since Zeuxis was mainly a panel painter of few figures we can conjecture that the payment must have been for an easel painting. Later mosaics left in Pella, typically representing at least a couple of human figures, may have reflected the style or even the composition of such a painting (Moreno, 1987).

One of the best documented Greek painters in terms of transactions is Aristeides of Thebes, who was active around 360-310 BC. He painted a “Battle with Persians” featuring a hundred men, each one paid ten mines by Mnason, the tyrant of Elatea between 338 and 297 BC, for a total of 16.6 talents, or 1,000 mines (Pliny, 35, 99).⁴⁶ This or other paintings of the same subject by Philoxenus of Eretria or potentially by Apelles (Moreno, 2010) could have been the source of the famous mosaic of the “Battle of Issus” from the *House of the Faun* in Pompeii. Other paintings by Aristeides will appear later in the secondary market. The same Mnason of Elatea purchased two other paintings agreeing on a fixed price per figure. However, the price per figure was not the same. A painting of mythological “Heroes” commissioned to Theomnestos was paid twenty mines per hero. A painting of “Twelve gods” by Asklepiodoros of Athens, who was rated as the major Athenian painter of his age by Plutarch and was admired by Apelles, was paid thirty mines per deity by Mnason, for a total price of 6 talents. The number of heroes was probably intermediate between the twelve gods and a hundred men, but closer to the former given the available number of heroes in Greek mythology: a total price of 10 talents would emerge conjecturing thirty heroes. According to Pliny, Aristeides and Asklepiodoros flourished around 332-329 BC, which could be the period of these three commissions from Elatea. It is also possible that the paintings, at least the two by Asklepiodoros and Theomnestos, which were jointly mentioned by Pliny, were also of similar size to be complementary in the decoration of the same room in the palace of the tyrant. The payment per figure was a natural way of incentivizing effort based on a quantifiable feature of the painting, as it will be in later centuries (see Etro and Pagani, 2012). Moreover, the price per figure was directly related to the intrinsic status of the figures (gods, heroes or semi-gods and humans), but also inversely related with the total number of figures, which suggests an early example of a quantity discount.

For the most celebrated Greek painter, Apelles, active around 350-310 BC, we know many anecdotes, occasionally including price matters. Alexander the Great paid 20 gold talents for his portrait as “Alexander Keraunophoros” or wielding a thunderbolt, a distinctive attribute of Zeus. The ambiguous remark by Pliny that the price was agreed on the basis of the measure of the painting remains unclear (Pliny, 35, 92).⁴⁷ The work was destined to the Temple of Artemis in the newly conquered town of Ephesus. Since the reign of Alexander the Great lasted from 336 BC to 323 BC and the Temple of Artemis was probably completed at a late moment in this period, we can date this painting after the commissions of Mnason and during the Persian campaign of Alexander, probably around 325 BC, when the Porus dekadrachms reproducing Alexander with a thunderbolt were struck. Another anecdote by Pliny reinforces the message that Apelles could obtain higher prices later on, tentatively in the last two decades of the IV century BC. Apparently, Apelles was quite generous with his rivals, as in the case of Protogenes, who was engaged in figurative painting only in the late

⁴⁶ “*Idem pinxit proelium cum Persis, centum himines tabula ea complexus pactusque in singulos minas denas a tyranno Elatensium Mnasone*”.

⁴⁷ “*Pinxit et Alexandrum Magnum fulmen tenentem in templo Ephesiae Dianae viginti talentis auri ... manipretium eius tabulae in nummo aureo mensura accepit, non numero.*”

phase of his career and apparently with limited success. When Apelles visited him in Rhodes and asked the price of his works, Protogenes mentioned some small amount. Then, Apelles offered 50 talents for each painting and spread the voice that he was going to resell it as his own painting. This signalled to the Rhodians the high esteem he had for the rival, and Apelles ended up selling the purchased paintings at prices higher than what he paid (Pliny, 35, 88).⁴⁸ We can guess that the prices of paintings by Protogenes, an experimental artist in the sense of Galenson (2006), must have been increasing in the last phase of his career. Most important for our purposes, what we can reasonably infer from this anecdote is that at that time, arguably around 315 BC, Apelles was able to sell a painting for 50 talents, though we cannot draw any conclusion on the size and composition corresponding to such a high price. This shows not only the business acumen of a leading artist as Apelles, engaged in an early case of successful art investment, but also how quickly price increases could spread around Greece, once buyers in a town could realize prices reached elsewhere. At the end of his life Apelles moved to Kos where, between 306 and 301 BC, he painted one of his most famous paintings, an “Aphrodite Anadyomene” (Venus rising from the sea) left unfinished for the temple of Asklepios (Moreno, 2010, p. 119): we will find again this painting traded in the secondary art market.

According to Plutarch (*Moralia*, 1093), king Ptolemy I of Egypt would have offered 60 talents to Nicias of Athens for a “Nekyomanteia”, or consultation of the souls, drawn from the *Odyssey* of Homer. Nicias was one of the most recognized historic painters of the time, and by then he must have been old, rich and famous since he refused the sale and donated the painting to his own town. In the Book XI of the epic poem, Odysseus spoke with Elpenor, Tiresias and Anticleia in his underworld journey and met dozens of souls, which suggests that this was a wide composition with a large number of figures, comparable to (and possibly also inspired by) the one of Polygnotus on the same subject. Since the reign of Ptolemy I lasted from 305/4 BC to 282 BC we can tentatively date the painting to 290 BC. In any case, this is the last and also the highest documented price evaluation that we find in the primary market for ancient Greek paintings.

Further information is about the secondary art market: in the II century BC the king Attalus of Pergamon bought a painting by Aristeides of Thebes for 100 talents (Pliny, 35, 100).⁴⁹ This was probably Attalos II whose reign lasted from 159 to 138 BC, exactly the time in which Pliny argued that art was revived after a period of stagnation. He was a notorious patron of the arts (and completed the Great Altar of Pergamon) as well as an avid collector of works by Aristeides, since he appears again interested in a painting by him at an auction of 146 BC, which gives us the first record of an auction sale of a precise painting. According to Pliny, the auction was taking place after the sack of Corinth by the Roman army of Lucius Mummius, and the painting was a “Dionysus and Ariadne” by Aristeides confiscated to the Corinthians after the battle. However, the sale to Attalos for the same amount of 100 talents (600,000 denarii) surprised so much Mummius that he wanted the painting

⁴⁸ “Apelles et in aemulis benignus Protogeni dignitionem primus Rhodi constituit. Sordebat suis, ut plerumque domestica: percontantique quanti liceret opera effecta, parvum nescio quid dixerat; at ille quinquagenis talentis poposcit famamque dispersit se emere ut pro suis venderet. Ea res concitavit Rhodos ad intellegendum artificem, nec, nisi argentibus pretium, cessit.”

⁴⁹ “Pinxit et aegrum sine fine laudatum, tantumque arte valuit ut Attalus rex unam tabulam eius centum talentis emisse tradatur.”

back and brought it to the temple of Ceres on the Aventine in Rome (Pliny, 35, 24).⁵⁰ Since the purchase by Attalos for such a high price took place at the end of his reign, we can conjecture that he already owned the distinct painting by Aristeides purchased at the same price, and that size and composition were not too different, justifying a similar expenditure. Given the wide and long career of this painter, possibly an experimental artist in the sense of Galenson (2006), it seems plausible that these masterpieces traded in the secondary market were from the late activity of Aristeides, which took place between 320 and 310 BC.

We are also aware of transactions of lower value in the later secondary art market of Rome. In the first half of the I century BC, the Roman orator Hortensius (114-50 BC), a rival of Cicero, purchased a panel of “The Argonauts” by Kydias from Kythnos, active around 364-361 BC according to Pliny, for 144,000 sesterces, or 6 talents, and we are told that he built a small shrine for it in his villa of Tusculum (Pliny, 35, 130).⁵¹ The destination and the title suggest that the painting was large and contained more than a couple of figures, but the subject was probably the pretext for a landscape or marine painting, and therefore the figures may not have played a dominant role in the composition. For a cheaper acquisition we can look at copies of masterpieces. Pliny mentions a I century BC copy by Dyonysios of Athens of a famous painting by Pausias, which therefore was originally executed around 350 BC. The copy was purchased for 2 talents by the Roman statesman Lucius Lucullus (118-56 BC) at the Dionysia festival in Athens, possibly in 88/87 BC when he was documented there. It was a portrait of a young girl named “Glycera”, a lover of Pausias, selling garlands of flowers, as she actually did for living (Pliny, 35, 125).⁵² This is the oldest painting with a content of portrait and still life for which we have records of a commercial transaction, and its subject would have been perfect in the “lucullan” banqueting room.⁵³ Taking into account the lower position of still lives in the hierarchy of painting and the fact that this one was just a copy, the price was nevertheless remarkable. It is probably not a chance that Pliny, with his encyclopedic attitude, managed to provide price records for masterpieces in all the main genres. And it is not unreasonable to assume that his small sample of price records was representative of the larger sample of masterpieces he must have read about (in Greek sources) while preparing the chapters of the *Naturalis Historia* on art.

Julius Caesar was also a collector. Though his military campaigns in Gaul and his forays into Britain and Germany could not find artworks comparable to those of the eastern world, according to

⁵⁰ “*Tabulis autem externis auctoritatem Romae publice fecit primus omnium L. Mummius cui cognomen Achaici victoria dedit. Namque cum in praeda vendenda rex Attalus [VI] emisset tabulam Aristidis, Liberum patrem, pretium miratus, suspicatusque aliquid in ea virtutis, quod ipse nesciret, revocavit tabulam Attalo multum querente et in Cereris delubro posuit, quam primam arbitror picturam externam Romae publicatam; deinde video et in foro positam volgo.*” The lack of understanding of art by the Roman military forces emerges from the account of the historian Velleius Paterculus (active at the beginning of the I century AD): “Mummius, however, was so lacking in culture that, when he had captured Corinth and was arranging for the transportation to Italy of paintings and statues, which were masterpieces by the hands of the greatest artists, he warned those in charge of the transportation that if they destroyed any of the statues and paintings they would have to replace them with new ones” (I, 13, 4).

⁵¹ “*Eodem tempore fuere Cydias cuius tabulam Argonautas HS CXXXXVIII Hortensius orator mercatus est eique aedem fecit in Tuscolano suo.*”

⁵² “*Postremo pinxit et ipsam sedentem cum corona, quae e nobilissimis tabula est, appellata stephaneplocos, ab aliis stephanopolis, quoniam Glycera venditanda coronas sustentaverat paupertatem. Huius tabulae exemplar, quod apographon vocant, L. Lucullus duobus talentis emit... Dionysius Athenis.*”

⁵³ The same family of Lucullus collected also expensive clay statues by Arkesilaos, as a “Felicitas” commissioned for 40 talents but apparently not completed due to the death of the artist. This was an extraordinarily high price, but Arkesilaos must have been quite successful since a plaster cast of a bowl by him had been paid a talent (Pliny, 35, 155-156).

Suetonius (*Life of Caesar*, 47) “he attacked Britain in the hope of finding pearls... and he was always avid collector of gems, engravings, statues, and paintings of ancient workmanship.” After his victory on Pompeus at Pharsalus in 48 BC, Caesar personally purchased two paintings by Timomachus of Byzantium, an “Ajax” and a “Medea”, for 80 talents to be placed in the Temple of Venus Genetrix (Pliny, 35, 136).⁵⁴ The same painter may have been the author of an “Ajax” and an “Aphrodite” purchased in Cyzicus, near Byzantium, for 50 talents (1,200,000 sesterces) by Marcus Agrippa (63-12 BC), a statesman promoter of the necessity of exhibiting art in public collections rather than in private villas (Pliny, 35, 26).⁵⁵ Pliny reports that Timomachus left “Ajax” and “Medea” unfinished when he died, which may have been right before the purchase by Caesar. However, there are good reasons to doubt that Timomachus was a painter of the I century (see for instance Gutzwiller, 2004). It seems unlikely that, in a period in which many artists were migrating to Rome (including Iaia from the nearby town of Cyzicus), a major artist was still active in the periphery of the Roman world. Most of all, already in 70 BC Cicero had pointed out the existence in Cyzicus of two masterpieces representing “Ajax” and “Medea”, wondering how much they could cost (*In Verrem*, IV, 60, 135). It seems likely that these masterpieces were those purchased by Caesar for such a prestigious destination in Rome, which would suggest that the author was not a contemporary painter, but a famous master of earlier times: this has supported the hypothesis that Timomachus was active in the early III century BC or even in the late IV century BC. We will endorse this convincing hypothesis and assign tentatively these works to 300 BC.

Octavian Augustus was not an art collector and did not decorate his own house with statues or paintings, but was nevertheless interested in bringing classic masterpieces to Rome for public display: the Greek historian Strabo (about 63BC-24AD) claims (*Gheographikà*, 14, 657) that Augustus purchased the “Aphrodite Anadyomene” of Apelles from the temple of Asklepios in the city of Kos remitting 100 talents of due taxes. The same interest may have been shared by the cultural administrator of Augustus, the wealthy Gaius Clinius Maecenas, who became famous as a patron of the arts and a supporter of poets such as Virgil and Horace.⁵⁶ However, there is no evidence that such “maecenatism” extended to contemporary painters and sculptors, another sign that at the time the local artists were mainly artisans without a relevant role in the cultural life of Rome. The emperor Tiberius was another avid collector, who owned works at least by Zeuxis, Parrhasius, Apelles, Protogenes and Nikias, and had a special interest in lascivious subjects. Pliny reports an anecdote by the historian Deculo, according to whom Tiberius fell in love with a painting by Parrhasius: the painting depicted an “Archigallus”, probably an eunuch minister of the cult of Cybeles, and Tiberius would have paid the incredible amount of two hundred and fifty talents to place it in his personal room (Pliny, 35, 70). Such an extraordinary price is not entirely reliable,⁵⁷ and even accepting that it

⁵⁴ “*Timomachus Byzantius Caesaris dictatoris aetate Aiace et Medeam pinxit ab eo in Veneris Genetricis aede positas, LXXX talentis venundatas.*”

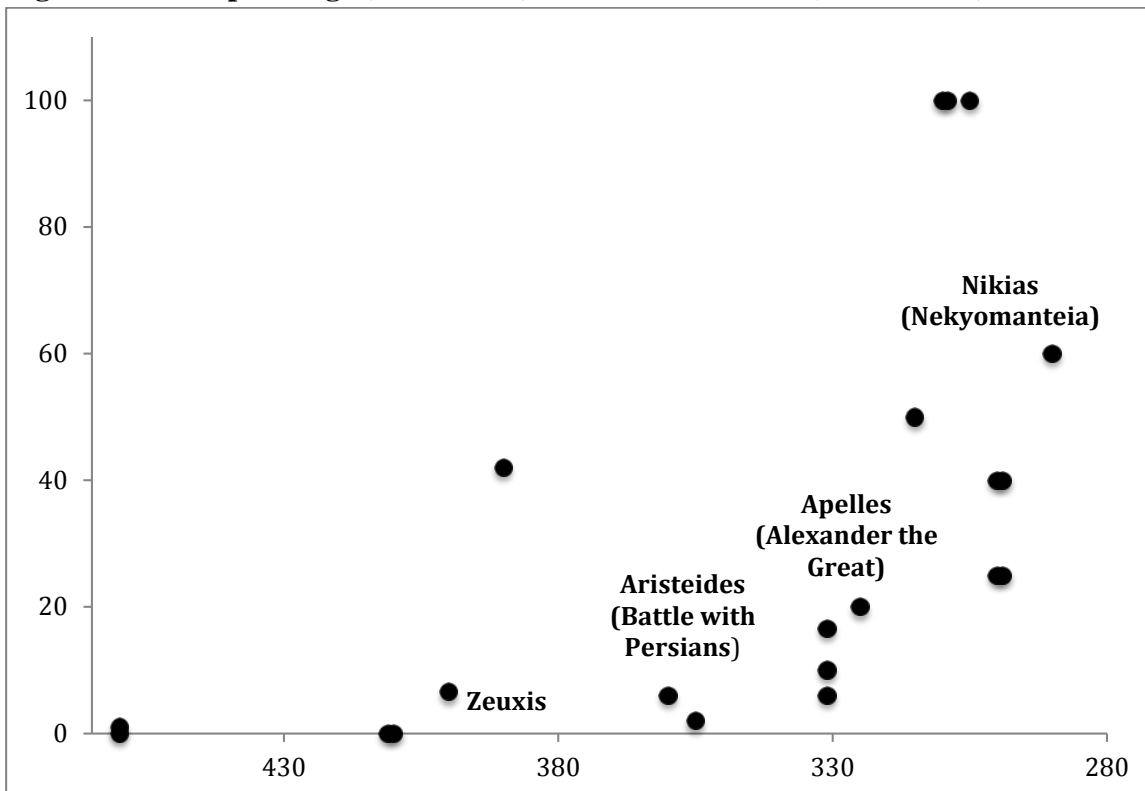
⁵⁵ “*M. Agrippa vir rusticitati propior quam deliciis. Exstat certe eius oratio magna et maximo civium digna de tabulis omnibus signisque publicandis, quod fieri satius fuisset quam in villarum exilia pelli. Verum eadem illa torvitas duas Aiace et Veneris mercata est a Cyzicenis HS [XII].*”

⁵⁶ It is interesting that the major poem of Virgil, the *Aeneid*, followed the poems of Homer in various aspects, including descriptions of valuable objects and awards for contests, but never mentioned the value of a single object.

⁵⁷ “*Pinxit et archigallum, quam picturam amavit Tiberius princeps atque, ut auctor et Deculo, HS [LX] aestimatam cubiculo suo inclusit.*” The upper bar with vertical brackets, which multiplied numbers by a hundred thousands, implying 6 million sesterces or 250 talents, may have been changed in transcriptions from a simple upper bar, which multiplied

corresponds to the original figure mentioned by Pliny, it could be part of a rethoric finalized at throwing a shadow on the perversions and vices of an emperor who felt in disgrace at the time of Pliny. Tiberius destined to his private rooms also another painting of Parrhasius, an “Atlanta and Meleager” in this case priced a more reasonable amount of 40 talents (a million sesterces),⁵⁸ and the famous statue of the “Apoxyomenos” by Lysippos removed from the Baths of Agrippa: according to Pliny this created such an outrage that Tiberius was forced to send the works back to public display. This attitude toward private collecting appears coherent with an emperor who gradually withdrew from public activity and retired in his villa in Capri, probably with his beloved paintings. It is also our last evidence on prices of classical paintings.

Fig. 1: Prices of paintings (TALENTS) in Classical Greece (480-280 BC)



Under the heroic assumption that we can turn into data also the conjectures made above, we can put together 21 price records and proceed to formally test our hypothesis of an increasing trend of the prices of paintings. Fig. 1 reports the nominal prices in talents at the estimated year of execution. While this suggests already an increasing trend, we want to control better for the available information on these commissions. Table 1 reports some descriptive statistics for the nominal prices, the real prices in terms of the purchasing power of a talent in 450 BC in the Periclean Athens (from Loomis, 1998), the estimated number of figures and the estimated year of execution. Tables 2-3 report the

numbers by a thousand, implying 60,000 sesterces or 2.5 talents (“A sketch of the history of painting” by Ralph Nicholson Wornum, 1859, John Murray Ed., London).

⁵⁸ According to Suetonius (*Life of Tiberius*, 44), when Tiberius obtained a painting of Parrhasius depicting Atalanta pleasuring Meleager with her lips, on condition that if the theme displeased him he was to have a million sesterces instead, he chose to keep the painting and actually hung it in his bedroom (“*Quare Parrasi quoque tabulam, in qua Meleagro Atalanta ore morigeratur, legatam sibi sub condicione, ut si argumento offenderetur decies pro ea sestertium acciperet, non modo praetulit, sed et in cubiculo dedicavit*”). The painting could be tentatively dated around 390 BC.

main price regressions with some robustness checks.⁵⁹ Table 2 is based on nominal prices in talents and Table 3 is based on real prices adjusted for changes in purchasing power. Both tables emphasize a significantly positive time trend in all the specifications (years BC are converted into an increasing scale). Without controls, we find a 1.6% (2.4%) increase of real (nominal) prices every year, which is slightly reduced in richer specifications, with a 1% (1.6%) yearly increase in the full specification. The estimated number of figures has always a positive coefficient, but this is neither economically nor statistically significant (in spite of the positive relation emphasized for the three paintings paid by Mnason on a per figure basis). The dummy for sales in a secondary market has a positive, high and sometimes significant coefficient, but does not affect the evidence of a substantial time trend. Two artists for which we have three observations are Zeuxis, active in the early phase with a negative coefficient, and Apelles, active in the late phase with a positive coefficient, but the inclusion of their dummies does not affect the evidence of a positive time trend. Following explorations in other periods of art history (Etro, 2018), we also build a proxy of artistic quality as perceived in ancient times through the number of rows dedicated by Pliny to the documentation of each painter in a representative edition of the *Naturalis Historia*: such a Pliny index is led by Apelles (189), followed by Parrhasius (66), Zeuxis (50), Pausias (40) and Aristeides (32) and is positively correlated with the price of paintings in our dataset. Its inclusion in the regressions provides a positive and significant coefficient but without eliminating the significance of the positive time trend.

Finally, we add two sets of robustness checks in our regressions on real prices. When we consider artist dummies for both of the best paid artists of the late phase, Apelles and Aristeides, we obtain positive coefficients for both of them, but with a marginal reduction of the time trend. When we limit the analysis to paintings sold in the primary market, again there is no impact on the time trend of the basic regression. Finally, we remove from the basic analysis the three cases of zero prices, all of which were recorded in the early period, and focus only on positive prices: also in this case the coefficients of the time variable is only marginally affected compared to the baseline model. Overall, the evidence strongly supports a positive increase in the price of masterpiece paintings between the beginning of the V and the end of the IV century BC.

5. Evidence on the price of statues of the Roman Empire

The main piece of evidence on art prices during the Roman Empire comes from inscriptions at the base of statues spread around all the provinces, sometimes recording prices of the commissions to honor the munificence of the donor. Since towns that have been repeatedly built over during the following centuries are less likely to conserve such rests, a large part of the epigraphic evidence derives from peripheral towns and archeological sites that have not been excavated until recent times, whose distribution covers most of the “Romanized” provinces of Europe and Africa, where many colonies founded or populated by Roman citizens were being decorated with temples, forums, baths and villas that required new statues. The geographical distribution of the evidence is quite important because our interest is in comparing prices across different and remote locations of the Empire rather than identifying prices of works commissioned in Rome by emperors under unique monopsonistic conditions. The statues commissioned by local communities and private patrons for public display

⁵⁹ To include records of zero prices, the dependent variable is $\log(1+x)$ where x is the relevant price, either nominal or real.

included gods, heroes, portraits of the emperor, often replicas of models sent from Rome to the periphery of the Empire, portraits of women of the imperial family, and portraits of the donors.

The first collection of records of prices of statues was put together by Friedlander (1913), but the most comprehensive one is due to Duncan-Jones (1982), who has focused most of his attention on the African provinces, which covered a large area between modern Libya and Morocco. At the time, these provinces were Mauretania Caesariensis, Numidia and Africa Proconsularis (Byzacena, Tripolitania and Zeugitana), with the latter including Numidia Procunsularis. In these provinces, the median price of statues in Africa was of HS 5,000, including the price of the base.⁶⁰ But the variability was also high: the major town of Leptis Magna left a statue priced HS 460 and a commission of sixteen statues for a total of a million sesterces. As an example, focusing on dated standalone marble statues of Septimius Severus in Numidia at the beginning of his reign between 193 and 198 AD we find prices of HS 2,400 and 3,400 in the town of Hr Kudiat Setieh and HS 4,000, 4,300 and 10,000 in the town of Diana, suggesting a certain variability over non-observable dimensions. We have complemented the data on African provinces with marginal additions, such as a bronze statue from Giufi in Zeugitania priced HS 8,000 around 229/235 AD (AE 1999, 1828).

Italy provides few price records analyzed by Duncan-Jones (1982), who admits that his sample is too small and uneven to draw solid conclusions on price comparisons, but suggests that “it is reasonable to suppose that the norms in Italy would not have been very different from those in Africa, where the heaviest concentration of statue prices lies in the range from HS 4,000 to HS 7,000” (Duncan-Jones, 1982, p. 126). Also in Italy price variability was high, in a range including a statue from Volsini in Etruria priced HS 500 before 200 AD and a silver chariot of the II century priced HS 100,000 in Formiae in Latium. We have added to the dataset a few more records from Italian regions whose inscriptions were published during the last four decades. For instance, this was the case of Barium in Apulia with a statue of HS 10,000 from the middle of the II century (AE 2008, 416),⁶¹ Misenum in Latium with HS 20,000 in 161-211 AD (AE 1995, 311), Potentia in Lucania with HS 10,000 during the I century (AE 1995, 370) and Interamnia Praetuttiorum in Picenum with HS 4,000 during the II century (AE 2013, 194). The final dataset includes statues from the regions of Latium (and Campania), Lucania, Venetia, Umbria, Apulia, Etruria, Transpadania, Aemilia, Picenum and Samnium.

Gallia and other northern European provinces provide an additional group of price records. Drinkwater (1979, 2014) has mentioned a couple of statues from Aventicum in Germania Superior, to which we should add a statue of Mars priced HS 48,000 at the end of the II century in Mutigney (in Swiss territory) for a testamentary outlay (AE 2014, 896). The nearby province of Gallia Narbonensis left a bronze of HS 6,000 in Arles (AE 2002, 921) and silver statues from Nimes (AE 1982, 682 and CIL 12, 3058), Narbonne (CIL 12, 4445) and Vienne (CIL 12, 5864). From other northern provinces we also have a couple of price records in Pannonia Inferior (in modern Hungary), respectively HS 50,000 for a statue from Aquincum (AE 1990, 810), and HS 40,000 for a statue from

⁶⁰ In one case emphasized by Duncan-Jones (1982, pp. 78-79), the cost of the base was specified separately: “At Sigus in Numidia a statue of Baliddir built after the death of Caracalla cost HS 3,200 and its limestone base HS 400. The total cost is relatively low, well below the median of HS 5,000, despite its fairly late date. The base is of a more or less standard size: its frontal dimensions are 1x0.60 metres, and the inscription of fourteen lines is about the usual length. Its cost makes up nearly 12% of the total outlay.”

⁶¹ See Silvestrini (2008) for interpretations of this inscription.

nearby Vetus Salina (AE 2013, 1201). We should also add the unique case of a Roman artwork arrived to us with author and price, a bronze statuette from Britannia whose base has inscribed a dedication to Mars from the Colasuni brothers, who paid HS 112 to the coppersmith Celatus, of which HS 12 was for the bronze material and the rest for the execution.⁶² This corresponds to a cost of artistic manufacture representing about 90% of the total price, probably in line with common works in marble, but higher compared to larger bronze statues (where the cost of the material was more relevant).

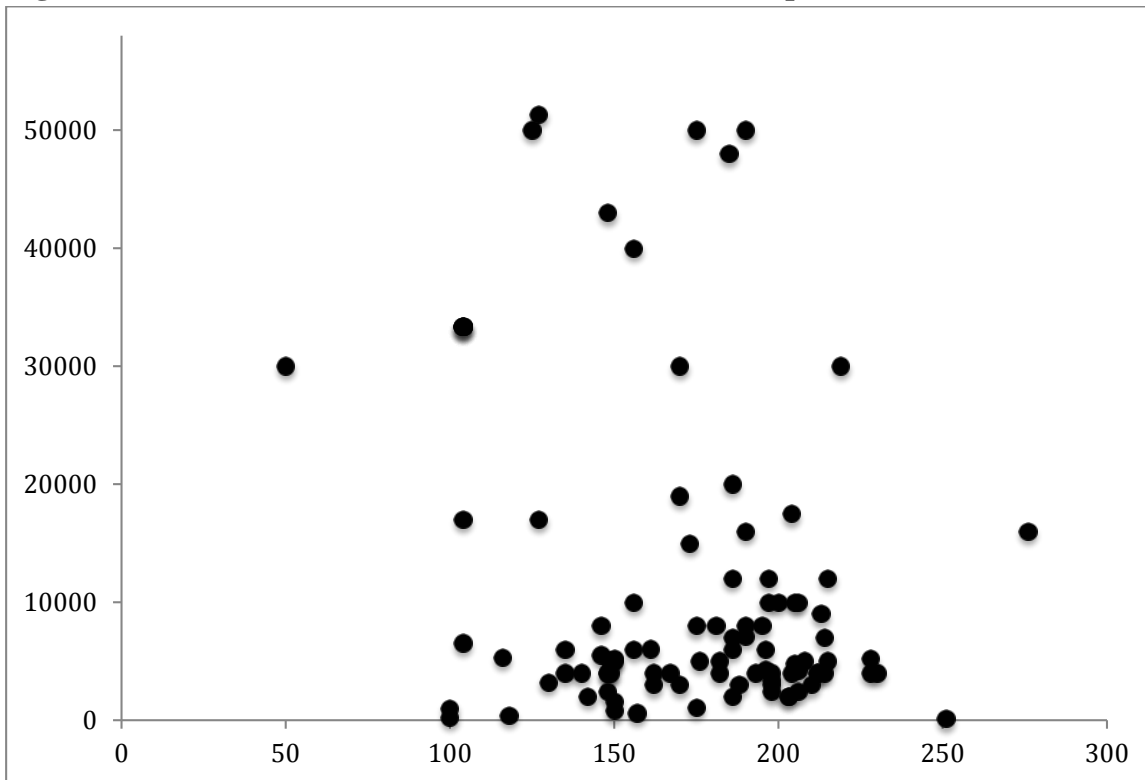
Spain was deeply “Romanized” and its local communities ordered many statues for which we have price records. The important work of Curchin (1983, 2014) has collected a list of prices of statues for the Spanish provinces that we use in our dataset with a few additions. In particular, we add a statue valued HS 7,505 according to an inscription from Guadix in Hispania Citerior (CIL 2, 3390) and a price of HS 4,800 probably for two statues commissioned in Hispania Baetica (CIL 2, 1359). We have aggregated observations from these provinces under the group from Hispania. Unfortunately, there are virtually no price records from Egypt, probably because its peculiar traditions were hardly associated with public records of prices of statues.

Asia Minor provides more interesting evidence added to our dataset. Barresi (2003) has analyzed commissions from Asia Minor, with a particular focus on the province of Asia. He has pointed out seven statues representing the different tribes of the town of Philadelphia, which were paid a total of HS 28,000 at some point after 212 AD, and a statue representing its own donor, Aeliua Aelianos, recorded in the town of Thyatira and paid HS 4,000 between 222 and 235 AD. Moreover, the major town of Ephesus has provided epigraphic evidence of a few groups of silver statuettes dated in 104 AD (see Kokkonis, 2018). For six of them, each one representing Diana Artemis of Ephesus together with two other figures, we have the prices, ranging between HS 6,533 (IK-11-01, 34), HS 17,000 (CIL 3, 14195-4) and HS 33,000 (CIL 3, 14195-5,6,7,8). More limited is the information from Greece. However, we can exploit a literary source of the early II century AD: Dio Chrysostom mentioned that at the time one could erect statues at the cost of HS 2,000 or HS 4,000 in Rhodos, which did belong to the province of Asia.⁶³ Finally, a small marble statue was priced HS 140 during the II century AD in Philippi within the province of Macedonia (CIL 3, 633). We group together these observations as from Greece and Asia.

⁶² The statuette from the middle of the II century, currently at the British Museum of London, is 27 cm high for a weight of 1.64 kg. The inscription is the following: “*DEO MAR(TI) ET / NV(MINI)B(VS) AVG(VSTORVM) COL/ASVNI BRVCCI/VS ET CARATIUS DE / SVO DONARVNT / AD SESTER(IOS) N(VMMOS) C(ENTVM) / CELATVS AERAR/VS FECIT ET AERA/MENTI LIB(RAM) DONAV/IT FACTAM (DENARIIS) III.*”

⁶³ From the *Discourses* (31, 59): “Those things for which a man has paid the price to their owners nobody even thinks of maintaining, I presume, that he cannot justly be permitted to keep for himself, and the more so, the greater price he has paid. Well, each and every one of these men has paid a price for his statue and no moderate price either; some of them brilliant service as generals in defence of the city, others as ambassadors, while others have given trophies won from the enemy, and certain others money as well, perhaps - not, by heavens, a mere matter of a thousand or five hundred drachmas, sums for which it is possible to erect statues.”

Fig. 2: Prices of statues (SESTERCES) in the Roman Empire (0-300 AD)



The final dataset includes about two hundred price records. The basic information for each record contains the price and the place of the commission. Between the Italian regions, we have most of the records from Latium and Campania, Lucania, Venetia, Umbria, Apulia and Etruria. Outside of Italy, the province featuring most of the prices of single statues is Numidia, followed by Africa Procunsularis, Asia, Hispania Baetica, Gallia, Mauretania Caesariensis and Germania Superior. For about two thirds of the observations we can recover from the inscriptions the date of commission of the statue or, more often, the approximate period. On this basis we have allocated statues between those from the *I century* (including the Julio-Claudian and Flavian dynasties), the period of the emperors *Trajan and Adrian* (98-138 AD), the *Antonini* emperors (138-192 AD) including Antoninuns Pius, Lucius Verus, Marcus Aurelius and Commodus, the dynasty of the *Severans* (193-235 AD), including Septimius Severus, Caracalla, Geta, Elagabalus and Severus Alexander, and the *Mid III century*. When the estimated period of commission overlaps two of these groups, the statue is attributed to both of them. For quantitative purposes we have also assigned the exact year of execution when this was available or an estimate when the range was well defined in a period shorter than a century.

Prices are all reported in sesterces (possibly converted from denari) and they all belong to the period preceding the beginning of inflationary pressures, mostly started in the last three decades of the third century. In almost all cases we know the subject of the statue. Portraits of Roman emperors are common in the dataset, and Hadrian is the most frequent one, which is consistent with the fact that there are more surviving portraits of him than of any other emperor after Augustus: for instance, statues of Hadrian are recorded in Africa Procunsularis at Hippo Regius in 117/138 AD for a price of HS 17,000, at Vina in 138/161AD for HS 2,400 and at Suturnuca in 146AD together with a statue of Lucius Verus for a total price of HS 5,525. Other frequent emperors in the dataset are Antoninus Pius,

Marcus Aurelius and Lucius Verus, Commodus, Septimius Severus and Caracalla. For instance, Antoninus Pius appears in Samnium with a statue of HS 4,000 dated 140 AD, in Mauretania with one of HS 6,000 dated 156 AD, in Africa Procunsularis with two statues priced HS 600 and HS 800 around the same period, and elsewhere jointly with other emperors.⁶⁴ There are also female imperial portraits as those of Julia Domna found in Ammaedara and Medeli in Africa Proconsularis priced respectively HS 10,000 and HS 3,000 at the beginning of the third century. The next more frequent subjects are mythological gods and heroes, such as Jupiter (present for instance with two statues dated before 200 AD and priced HS 800 in Venetia and HS 10,000 in Transpadania, with one of HS 6,000 from the II century in Baetica and with statues erected in Numidia in 182 and 212 AD for respectively HS 5,000 and HS 4,000), Heracles (with an early statue from Umbria priced HS 30,000 and others in Mantua as well as in Numidia) and Aesculapius (with statues from Theveste in 151/230 AD and Cuicul after 200 AD, priced respectively HS 50,000 and HS 4,000). Other frequent gods are Mercury, Apollo, Iuno, Minerva, Mars, Pluto and Neptune. We also have portraits of donors and many idealized figures as the youthful seminude *Genius Populi Romani* or the female *Victoria Augusta* and *Fortuna Redux*.⁶⁵

Our records are confined to cases where we know the exact number of statues commissioned for a given price: most of the records refer to one statue, but there are many instances of a couple of statues and cases of multiple ones, up to sixteen. We have information about the material of the statues. The conjecture by Duncan-Jones (1982) was that when the material was not specified in the inscription, the statue was likely to be in marble: while this conjecture cannot be verified, it was probably correct in a majority of cases. We occasionally know whether the price covered also an *aedicola* (we excluded more complex constructions as those combining arches and small temples with a statue), whether the statues were small (as a statuette or a bust) or large (as two equestrian statues of Septimius Severus erected in 196/197 AD for HS 12,000 or the one of Marcus Aurelius erected in 146 AD for HS 8,000, all of them in Zeugitania). In some cases we know the purpose of the commission, which is often part of a testament outlay (after the death of the donor), and occasionally we also know the name of the patron who paid for the commission. Since we know the exact provenance of the statues, we have identified those commissioned in large towns⁶⁶ and coastal towns with direct access to the Mediterranean Sea: in the former case one may expect higher prices due to higher demand or richer patrons and in the latter one may expect lower prices due to lower costs of shipping statues compared to inland and remote towns. Fig. 2 reports prices in sesterces for observations with precise dates distributed over three centuries, emphasizing the great variability in prices.

We report some descriptive statistics on the dataset for the Roman statues in Table 4. The regressions of Tables 5 and 6 on nominal and real prices are divided between a version with basic characteristics of the statues (baseline), a version controlling for temporal differences (time), one augmented also

⁶⁴ See Højte (2005) for a comprehensive study of bases of statues of the Roman emperors.

⁶⁵ For instance, we find statues of *Victoria Augusta* in II century Hispania Baetica at the price of HS 4,000, in Numidia at the prices of HS 5,300 in 116, HS 6,040 around 161, HS 4,000 in 160 and again 198, HS 4,800 in 198/211, HS 9,000 in 213 and HS 30,000 around 219, as well as in Mauretania at HS 5,000 in 195 and finally in Africa Procunsularis at the price of HS 16,000 in 276.

⁶⁶ Obvious cases are Rome, major towns such as Leptis Magna and Ephesus (Cartage, Alexandria and Antiochos are not in the dataset), and regional capitals such as Nimes or Cirta. However, we included in the dummy also towns of medium size, such as Lambaesis (station of the African legion), Hippo Regius (seat of a proconsular legate), Sabratha, Theveste, Rusicade and Thamugadi.

with destination dummies (location), another including also the subjects of the statues (genre) and the full specifications. Table 5 shows that the nominal prices covary in an expected way with the number of statues (the relation is increasing and possibly concave), and with their size, as well as with the use of silver, which is priced above the omitted variable (mostly marble), and especially above bronze. The price appears higher than average in case of testamentary outlays. The subject of the statues does not appear to affect significantly their prices, as one should expect in a competitive market where artists are employed on different subjects. Moreover, prices do not change much over time, though there is a slight increase in the latest period, which may be in part due to the underlying inflation. Consistently with what one may expect, coastal cities are associated with lower prices and large cities of each province with higher prices, but none of these relations is statistically significant. Most of all, the prices do not vary significantly across provinces, with higher than average prices for Italian locations and lower than average prices for locations in Greece and Asia Minor, but only without all the control variables. In the full specification, none of the destination dummies has a significant coefficient, confirming our main prediction that market integration contributed to equalize art prices across the provinces of the Roman Empire.

Finally, in Table 6 we confine the attention to the statues for which we have a precise date or a reliable estimate of the period in which they were commissioned, and we adjust prices for the cost of living using the price index of Wassink (1991). The results show a negative but minimal trend in the real prices, which is however not statistically significant. The increasing and concave relation between prices and number of commissioned statues is now mostly significant and the other main patterns of the earlier set of regressions are confirmed. In particular, the available evidence on the real prices of statues from the Roman Empire confirms that these prices were largely equalized across different provinces, supporting the hypothesis that increasing trade over a large integrated market was equalizing profit opportunities across destinations.

6. Conclusion

We have studied art trade in the Greco-Roman world exploiting literary evidence preserved from ancient writers and epigraphic evidence survived after two millennia. Our purpose was to explore the economic determinants of different paths followed by Greek and Roman art markets. We have argued that increasing competition between patrons from rival city states in classical Greece contributed to generate quality-enhancing innovations and rising prices for artists' works together with a growing prestige of the same artists within society. Instead, the later Roman Empire developed a larger integrated market that tended to foster mass production and cost-saving innovations, and therefore a general leveling out of prices paid for art over time and across space, with the artists gradually sinking back into the anonymous role of craftsmen. The available evidence on art prices over time and space is consistent with these different paths.

There are some avenues for future research in economic history and cultural economics. From an economic history point of view, one may exploit further the data collected by modern quantitative approaches on the ancient world and verify the importance of other socio-economic factors in affecting art production. From a cultural economics point of view, one may compare the patterns emphasized in the ancient world with those of other historical periods and enrich the analysis of the

determinants of artistic creativity. In general we believe that further analysis on art markets could shed a new light on the evolution of art history and human creativity.

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TABLES

Tab. 1: Dataset on paintings in Classical Greece (V-III century BC)

<i>Descriptive statistics</i>					
	Mean	Median	St. Dev.	Min	Max
Price (talents)	31.0	20	34.0	0	100
Real Price (talents of 450 BC)	12.2	8.3	12.2	0	35.7
Pliny Index	48.8	32	61.4	2	189
N. of figures	12.5	2	25.1	1	100
Year BC	346	331	53.5	460	290

Tab. 2: Regressions on the price of paintings in Classical Greece (V-III century BC)

	(1)	(2)	(3)	(4)	(5)	(6)
Year	0.024*** (0.004)	0.023*** (0.004)	0.021*** (0.004)	0.019*** (0.005)	0.017*** (0.005)	0.016*** (0.005)
Pliny Index		0.004* (0.002)			0.006*** (0.002)	
N. of figures				0.009 (0.010)	0.013 (0.008)	0.011 (0.012)
Secondary market				0.974 (0.576)	1.182* (0.624)	1.081 (0.687)
Apelles			0.512 (0.583)			0.876 (0.765)
Zeuxis			-0.791 (0.637)			-0.273 (0.740)
Constant	-7.596*** (1.650)	-7.469*** (1.617)	-6.129** (1.904)	-5.954*** (1.891)	-5.577*** (1.815)	-5.001** (2.059)
Observations	21	21	21	20	20	20
R2	0.673	0.698	0.714	0.718	0.758	0.749
Adjusted R2	0.656	0.665	0.664	0.665	0.693	0.660

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Tab. 3: Regressions on the real price of paintings in Classical Greece (V-III century BC)

	(1)	(2)	(3)	(4)	(5)	(6)
Year	0.016*** (0.003)	0.016*** (0.003)	0.014*** (0.004)	0.012** (0.005)	0.010** (0.004)	0.010* (0.005)
Pliny Index		0.004** (0.002)			0.006*** (0.002)	
N. of figures				0.008 (0.010)	0.012 (0.007)	0.012 (0.011)
Secondary market				0.829 (0.531)	1.029* (0.579)	1.002 (0.639)
Apelles			0.472 (0.541)			0.826 (0.711)
Zeuxis			-0.558 (0.591)			-0.064 (0.688)
Constant	-4.981*** (1.503)	-4.858*** (1.459)	-3.881** (1.766)	-3.569* (1.744)	-3.206* (1.662)	-2.834 (1.914)
Observations	21	21	21	20	20	20
R2	0.538	0.579	0.582	0.592	0.654	0.631
Adjusted R2	0.514	0.532	0.508	0.515	0.562	0.500

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

	<i>Aristeides</i>		<i>Primary market</i>		<i>Only positive prices</i>			
					(1)	(2)		
Time	0.014*** (0.004)	0.016*** (0.004)	0.014** (0.05)	0.011* (0.006)				
N. of figures				0.004 (0.011)				
Secondary market				0.551 (0.644)				
Apelles	0.724 (0.525)							
Zeuxis								
Aristeides	0.922* (0.523)							
Constant	-4.063** (1.500)	-5.128*** (1.470)	-3.854* (2.197)	-3.151 (2.456)				
Observations	21	11	18	17				
R2	0.628	0.698	0.326	0.357				
Adjusted R2	0.529	0.665	0.283	0.209				

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Tab. 4: Dataset on statues in the Roman Empire (I-III century AD)

<i>Descriptive statistics</i>					
	Mean	Median	St. Dev.	Min	Max
Price (HS)	16,491	5,000	72,172	112	1,000,000
Real price (HS of 0 AD)	8,390	3,462	11,626	37	69,930
N. of statues	1.2	1	1,3	1	16
Year	166	175	49.6	0	276

Tab. 5: Regressions on the price of statues in the Roman Empire (I-III century AD)

	(1)	(2)	(3)	(4)	(5)
	Baseline	Time	Location	Genre	Full
Characteristics					
N. statues	0.481*** (0.144)	0.475*** (0.146)	0.602*** (0.155)	0.592*** (0.159)	0.520*** (0.162)
N. statues squared	-0.008 (0.010)	-0.007 (0.010)	-0.015 (0.010)	-0.015 (0.011)	-0.013 (0.011)
Small	-1.688*** (0.233)	-1.654*** (0.238)	-1.534*** (0.244)	-1.518*** (0.252)	-1.560*** (0.318)
Large	0.858*** (0.169)	0.858*** (0.175)	0.871*** (0.178)	0.877*** (0.180)	0.852*** (0.181)
Silver	1.654*** (0.272)	1.675*** (0.287)	1.658*** (0.296)	1.688*** (0.299)	1.589*** (0.318)
Bronze	-0.919*** (0.163)	-0.903*** (0.319)	-1.008*** (0.327)	-1.053*** (0.336)	-0.943*** (0.335)
Testamentary outlay					0.546*** (0.201)
Date					
Date unknown		omitted	omitted	omitted	omitted
I century AD		-0.116 (0.308)	-0.274 (0.324)	-0.311 (0.328)	-0.223 (0.328)
Trajan & Hadrian		-0.037 (0.206)	0.096 (0.224)	0.084 (0.227)	0.054 (0.237)
Antonini		0.159 (0.146)	0.107 (0.147)	0.145 (0.155)	0.080 (0.160)
Severans		0.091 (0.152)	0.096 (0.152)	0.131 (0.157)	0.098 (0.157)
Mid III century AD		0.024 (0.283)	0.089 (0.282)	-0.013 (0.293)	0.100 (0.295)
Location					
Numidia			omitted	omitted	omitted
Africa Procunsularis			0.041 (0.156)	0.091 (0.161)	0.122 (0.183)
Mauretania			0.046 (0.156)	0.092 (0.419)	0.129 (0.418)
Hispania			-0.132 (0.304)	-0.152 (0.312)	-0.141 (0.320)
North Europe			0.222 (0.318)	0.257 (0.327)	0.216 (0.328)
Italy			0.368* (0.231)	0.400* (0.241)	0.414 (0.260)
Greece & Asia			-0.739** (0.378)	-0.671* (0.389)	-0.357 (0.420)
Numidia Procunsularis					0.129 (0.273)
Coast city					-0.134 (0.256)
Large city					0.290 (0.256)
Subject					
Subject unknown				omitted	omitted
Portrait				-0.283 (0.233)	-0.281 (0.232)
Emperor				-0.225 (0.207)	-0.188 (0.206)
Victoria & Fortuna				-0.049 (0.224)	-0.131 (0.224)
Mythological subject				-0.176 (0.177)	-0.093 (0.186)
Jupiter					0.432 (0.384)
Constant	8.055*** (0.163)	7.990*** (0.179)	7.817*** (0.203)	7.914*** (0.227)	7.871*** (0.226)
Observations	202	202	202	202	202
R-squared	0.453	0.459	0.486	0.492	0.522
Robust standard errors	in parentheses, *** p<0.01, ** p<0.05, * p<0.1				

Tab. 6: Regressions on the real price of statues in the Roman Empire (I-III century AD)

	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Time	Location	Genre	Full with trend	Full with periods
Characteristics						
N. statues	1.197*** (0.371)	1.095*** (0.371)	1.334*** (0.374)	1.410*** (0.386)	1.175*** (0.418)	1.189*** (0.423)
N. statues squared	-0.123** (0.057)	-0.105* (0.058)	-0.124** (0.058)	-0.141** (0.060)	-0.141* (0.063)	-0.106 (0.064)
Small	-1.599*** (0.323)	-1.692*** (0.323)	-1.654*** (0.341)	-1.723*** (0.352)	-1.743*** (0.349)	-1.690*** (0.351)
Large	0.733*** (0.231)	0.802*** (0.232)	0.636** (0.252)	0.584** (0.255)	0.698*** (0.252)	0.826*** (0.262)
Silver	1.748*** (0.403)	1.649*** (0.402)	2.017*** (0.415)	2.195*** (0.433)	2.189*** (0.318)	2.180*** (0.504)
Bronze	-1.032** (0.423)	-0.958** (0.420)	-0.983** (0.417)	-1.042** (0.423)	-0.973** (0.412)	-0.879** (0.417)
Testamentary outlay					0.817*** (0.251)	0.722*** (0.266)
Date						
Year		-0.004* (0.002)	-0.002 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)
I century AD						0.452 (0.468)
Trajan & Hadrian						0.153 (0.307)
Antonini						0.403 (0.251)
Severans						0.140 (0.275)
Mid III century AD						-0.342 (0.335)
Location						
Numidia			omitted	omitted	omitted	omitted
Africa Procunsularis			-0.213 (0.212)	-0.111 (0.224)	-0.089 (0.251)	-0.156 (0.262)
Mauretania			0.0003 (0.561)	0.054 (0.572)	0.206 (0.565)	0.163 (0.567)
Hispania			-0.058 (0.415)	0.090 (0.436)	-0.124 (0.454)	-0.446 (0.511)
North Europe			0.847* (0.5038)	1.122** (0.532)	0.539 (0.548)	0.401 (0.559)
Italy			0.434 (0.329)	0.680* (0.367)	0.732* (0.404)	0.621 (0.382)
Greece & Asia			-0.774* (0.434)	-0.572 (0.455)	-0.295 (0.503)	-0.400 (0.525)
Numidia Procunsularis					0.211 (0.413)	0.338 (0.440)
Coast city					-0.323 (0.328)	-0.263 (0.334)
Large city					0.166 (0.280)	0.089 (0.288)
Subject						
Subject unknown				omitted	omitted	omitted
Portrait				-0.283 (0.233)	-0.514 (0.322)	-0.555* (0.334)
Emperor				-0.225 (0.207)	-0.218 (0.239)	-0.263 (0.262)
Victoria & Fortuna				-0.049 (0.224)	-0.085 (0.306)	-0.038 (0.316)
Mythological subject				-0.176 (0.177)	-0.041 (0.294)	-0.071 (0.296)
Jupiter					-0.798 (0.510)	-0.823 (0.531)
Constant	6.888*** (0.347)	7.586*** (0.503)	7.146*** (0.583)	7.029*** (0.601)	7.064*** (0.589)	6.600*** (0.533)
Observations	123	123	123	123	123	123
R-squared	0.450	0.467	0.522	0.537	0.589	0.606
Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1						

APPENDIX: GENRE DIFFERENTIATION IN ANCIENT PAINTINGS

This Appendix provides further details on genre differentiation in ancient painting. Figurative paintings were the most important in the artistic hierarchy, with a natural emphasis on mythological and historical subjects, including battles. Large “megalographic paintings” were commissioned by temples and public buildings in ancient Greece. The tradition continued in Rome mostly through Greek painters: we have records of a Greek artist named Plautius painting a temple of Juno already in 200 BC, a Metrodorus of Athens who was commissioned pictures for the triumphal procession of Aemilius Paullus in 167 BC and Alexandrian Demetrius who was also active in Rome in the same period. By the end of the I century BC there must have been groups of painters active in Italy, including eastern slaves and freedmen and probably some local artists: the signature of a local painter, Lucius, was found in Pompeii, below a “Pyramus and Thisbe” in the house of Octavius Quartio. Other names of Roman painters emerge in later periods, when Famulus was commissioned paintings in the Golden House of Nero, and Cornelius Pinus and Attius Priscus were commissioned the decoration of the temple of Honour and Virtue by Vespasian. Nevertheless, most of the evidence we have on figurative paintings in the Roman Empire, either by local or foreign artists, converges toward a repetition of older Greek prototypes. The wall paintings of Trimalchio’s house described by Petronius Arbiter in the I century novel *Satyricon* represent probably the extreme aspect of this approach.

Portraits are discussed by Pliny complaining that the beauty of ancient Greek art has been disappearing from Roman collections (Pliny, 35, 4-5). Nevertheless, surviving examples witness an advanced level of realistic portraiture once we discount their provincial origins: this is the case of portraits on wall-paintings of Pompeii (which occasionally replaced busts and heads embossed on metal shields, named *clipeatae imagines*), as the baker Terentius Neo with his wife, or the famous funerary portraits on wood panels found at Fayum in Egypt (mostly from the I-III centuries AD).

Landscapes were also executed as standalone subjects in the ancient world, as in the frieze of the “Hunting scene” found in the royal tombs of Vergina, but it is likely that Roman paintings developed further this genre (*toparia opera*). This is witnessed by Pompeian examples ranging from sacro-idyllic views with mythological additions and Egyptianising landscapes to garden views and pseudo-impressionistic cityscapes (Ling, 1991, p. 142). We also know from Pliny the identity of an Augustan artist, probably called Studius, who painted landscapes in Rome and introduced marine and harbour views similar to those found in Pompeii and sold at a low price (Pliny, 35, 117). This suggests that landscapes were a popular genre that was not entirely dominated by copies of Greek originals.

Genre paintings must have been spread in Greece. According to Pliny, they could attract painters who were paid as much as masters engaged in major figurative paintings. This was the case of Peiraikos (active in the III century BC), who was quite sophisticated as a painter of humble things (*rhyparographia*), such as shops of barbers and shoemakers, donkeys and even still life paintings with food, so that his works were sold at higher price than the best works of many other painters (Pliny, 35, 112), or a certain Calates, who was specialized in comedy subjects. Abundant examples from Pompeii suggest that genre paintings flourished also in the Roman context, and by their nature (including scenes with pygmies, cupids engaged in metal-working, burlesque and erotic subjects, but also scenes of daily life and even a fight at the amphitheater of Pompeii between locals and residents of nearby Nuceria), some of them could have been original creations which were independent from foreign originals.

Still life paintings (*xenia*) were mentioned in ancient Greek art at least since the context between Zeuxis and Parrhasius, and were executed by specialists such as Pausias, who was famous for the impressive foreshortening of a bull, or the mentioned Peiraikos. They experienced a revival in Roman times (Ling, 1991, p. 153), where the first survived examples are Bacchic objects in the Farnesina villa from around 20 BC. Most of all, we conserve a variety of wonderful frescoes of the I century AD found in Pompeii and depicting fruits, flowers, birds, fishes, dead animals, writing tools and more (as those from the house of the magistrate Marcus Lucretius Fronto).