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Boisguilbert's use of political arithmetic to denounce the illusions and the disorder of the reign of Louis XIV

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Abstract: In this article we show that Boisguilbert could be considered a forerunner of the employment of quantitative analysis in economics. To ground our analysis, we examine Boisguilbert's possible links with British political arithmetic and set out the influence this may have had on his thought and on his estimations of the wealth of the kingdom of France and the income of the king. Reconstructing the data Boisguilbert uses, we also show that his analysis of public revenues and good price is grounded on the distinction he makes between current and constant prices. On this basis, echoing Gramont's analysis (1620), Boisguilbert seeks to reveal the monetary illusion to which he perceived his contemporaries as having fallen victim. Against popular opinion, Boisguilbert estimates that while the current revenues of Louis XIV have increased, his real revenues have in fact decreased. This proves that the French tax system is highly imperfect. According to his estimations, the real price of grain is also disproportionate: far from being too high, it is in fact half what it should be. We thus see Boisguilbert using quantitative analysis to identify the causes of the ruin of the kingdom of France, to dissipate the illusions of his contemporaries, and to propose ways of restoring the good order.

Keywords:
Boisguilbert, crisis, Gramont, monetary illusion, order, proportion, Petty, political arithmetic, quantitative analysis, wealth.

JEL Codes:
B11, E02, E21, E31.

Introduction

Pierre le Pesant de Boisguilbert (1646–1714) is often considered to be one of the founders of economics (see, for example, Aspromourgos 1996: 2; Cadet 1870; Defalvard 1992; Faccarello 1986, 1999; Marx 1859: 52; Rosanvallon 1982: 37; Schumpeter 1954: 208–213; Waterman 2003: 121). His influence on economic thought is indeed undeniable (see, for example, Groenewegen 1994, 2001; Hecht 1967; Mac Donald 1954, 1955), particularly with regard to eighteenth-century economic thought. Although during this period it was not the custom to make named mention of other authors in one's writings, Boisguilbert is explicitly quoted by Vauban (1707: 3) and Dutot (1738: I 388 note), and implicitly by Cantillon (1755a: 248; see also Cantillon 1755b: 305). He is mentioned by authors of the French science of commerce of the Gournay circle (for example in Herbert 1755: xii note, 135 note; Forbonnais 1767: I 286), and also had a significant influence on physiocratic thought. Mirabeau (1757: II 30) quotes him and considers him to be the forerunner of physiocracy, while Quesnay seems to have been directly inspired by him (1757b: 216–217; cf. Boisguilbert 1707b: 829–830; and Quesnay 1758).

Boisguilbert is also presented as the forerunner of various approaches in economics. Faccarello (1999: 160) recalls that Boisguilbert "was covered in praise for having, simultaneously, identified Say's law, Walras' general equilibrium and Keynes' under-employment. Boisguilbert becomes the precursor of just about everybody, or, to reuse a telling expression, he becomes the Jochanaan of political economy" (for a summary of various interpretations of Boisguilbert, see Faccarello 1999: 143–164).

Last but not least, Boisguilbert is considered one of the first promoters of the value of self-interest (Christensen 2003; Faccarello 1986, 1999; Perrot 1984: 351; Waterman 2003). Gilbert Faccarello and Philippe Steiner (2008) even regard him as the initiator of what they call a "*philosophie économique*", as having proposed a new and more abstract way of thinking about economic phenomena, based on three elements: "1. a conception of human action as self-interested, whether this is considered at the pragmatic level of daily activity oriented toward gain or at a purely intellectual level as a form of utilitarianism. […]. 2. a sensationist theory of knowledge that takes account of the way in which individuals apprehend the world. […]. 3. a relation set up with those who govern, or in the language of the time, with the legislator" (Faccarello and Steiner 2012: 326). To ground these considerations, scholars have emphasized the diversity of Boisguilbert's sources of inspiration, including Jansenism (Faccarello 1986; 1999; Jungels 2021; Waterman 2003), Jansenism and Cartesian occasionalism (Perrot 1984), Epicurean and Stoic sources (Christensen 2003), or Christian theology, Augustinianism and Newtonianism (Waterman 2003).

In this article, we propose to examine Boisguilbert's writings through another prism: that of political arithmetic and quantitative analysis. This choice is grounded on Boisguilbert's use (or, perhaps, abuse) of numbers and his ambition to provide objective evidence for his analysis. Contrary to other scholars who have already underlined this possible influence (Magnot-Oglivy 2020: 42–45; Reungoat 2017, 2018), we take his use of quantitative methods seriously and try to see to what extent we can justify the data he puts forward. We choose therefore a different perspective from the sensationist theory of knowledge proposed by Faccarello and Steiner (2008) and consider Boisguilbert as seeking to propose an analysis grounded on objective data. From this point of view we suppose that numbers possess both empirical and theoretical import in Boisguilbert's analysis.

To underpin our analysis, we show in section 2 that Boisguilbert could have known some of the essays of the British tradition of political arithmetic, and was certainly influenced

by Petty's method. Following the logic of this analysis, we reconstruct some of Boisguilbert's data concerning the wealth of France.

In section 3, we consider the possibility that Boisguilbert was also inspired by the embryonic tradition of political arithmetic that already existed in France, and particularly by Scipion de Gramont's analysis. Boisguilbert tries to take into account the effects of inflation to address what he considers to be a monetary illusion. He shows that whereas the tax burden was now higher, the king's revenues during the second half of the seventeenth century had also declined. Grain prices were also disproportionate, by far from being too high, they were in fact half what they should be. Because of the disproportionalities of taxes and prices, the wealth of France had been diminished by half.

On these grounds, we conclude in section 4 that Boisguilbert could be considered as a pioneer of quantitative analysis both in economics and economic history. The aim of his political arithmetic is to condemn the bad order of the reign of Louis XIV and to reveal the good order.

2. The influence of political arithmetic on Boisguilbert's writings and his quantitative analysis of the wealth of the kingdom of France

2.1. The diffusion of British political arithmetic at the end of the 17th century in France

According to scholars (for example, Damien 2003), political arithmetic did not really take root in France at least until Melon's second edition of the *Essai politique sur le commerce*, which dedicates an entire chapter to the topic (1736, ch. 24). Charles and Théré even consider that political arithmeticians "were hardly discussed and even less translated before the middle of the 18th century", and indeed that "it was only in the decade 1750 that there was a brief but intense interest in English political arithmeticians" (Charles and Théré 2021: 314). For them, Diderot's 1751 article in the *Encyclopédie*, Forbonnais's chapter in the *Négociant anglois* "De l'usage de l'arithmétique politique" (1753: cxii–cxl), but mainly Quesnay's articles in the *Encyclopédie* (1756, 1757), initiated the spread of political arithmetic in France. And this is confirmed by the partial translation of Petty's *Political Arithmetick* in the *Journal Oeconomique* of June 1757 (1757: 157–179). But while it may be true that the 1750s was a moment of real interest in political arithmetic in France, it does not follow that this moment had no precedent.

In Martin's book devoted to political arithmetic in 18th-century France, at least two earlier cases are mentioned (Martin 2003): Vauban (see, for example, Damien 2003: 20–22; Virol 2003 ch. 7) and the abbé Castel de Saint-Pierre. Vauban's aim in his *Méthode génи ralle et facile pour faire le dénombrement des Peuples* (1686) was to know the French kingdom better, to count its inhabitants and to evaluate its wealth in order to establish his Dixme royal (1707). Vauban also wrote his *Supputation curieuse sur l'accroissement des hommes avant et après le deluge* dated 1 March 1698, echoing Petty (see Virol 2001: 867–868), and Virol suggests a number of different connections between Petty and Vauban (2001: 857–858, 867–870). Writing a little later, the abbé Castel de Saint-Pierre is another case in point. Petty's influence on Castel de Saint-Pierre is evident (Hébert 2011: 225–226; Poulouin 2016; Reungoat 2018). Castel de Saint-Pierre explicitly quotes Petty (for example, 1723 §68, 1725a §9, 1725b §171, 1735 §1, §6), and briefly sets out his method (1723 §70–72).

Thus, British political arithmetic seems to have been known in France in the early 18th century and even at the end of the previous one. We can find a confirmation of this in Dubos's 1703 work *Les interets de l'Angleterre mal-entendus dans la guerre présente*, which

makes several references to Petty (1703: 78, 170, 198), Davenant (1703: 5, 9, 36, 64 footnote, 79 footnote, 98 footnote, 121, 124, 256, 261, 264), or King (1703: 26). Inspired by the approach of political arithmetic, he criticizes taxation in a manner similar to Boisguilbert, as well as war, which harms trade. The book seems to have been quite successful: as early as 1704 a revised sixth edition was published (Dubos 1704). But even five years previously, a bilingual French and English edition of Petty's *Five Essays in Political Arithmetick/Cinq essays sur l'Arithmétique Politique* had been published in London (Petty 1699). The polemic between William Petty and the French mathematician Adrien Auzout concerning the estimation of the populations of London and Paris also proves that Petty's ideas were known and debated in France before Petty's death in 1687 (for a presentation, see Reungoat 2004: 89, 130–132). In passing, we may note that Petty's *Two Essays in Political Arithmetick, concerning the People, Housing, Hospital, etc. of London and Paris* (1687) was first published in French in 1686 under the title *Deux essays d'arithmetique politique, touchant les villes et hospitaux de Londres et Paris*. According to Reungoat (2017: 26), "the *Essays on Political Arithmetic*, published in England between 1683 and 1687, were reviewed in several French-language periodicals, and some of them were even published in French". Moreover, according to Petty's *Dedication to the King* of his *Political Arithmetick* (1690), if "the Doctrins of this Essay [had not] offended France they [would have] long since seen the light, and [would have] found Followers, as well as improvements before this time, to the advantage perhaps of Mankind". We can conclude that some awareness of political arithmetic was already spread in France before the end of the 17th century.

2.2. The possible influence of British political arithmetic on Boisguilbert

A first indication of the possible influence of political arithmetic is the use (or abuse) of numbers in Boisguilbert's writings. As Magnot-Ogilvy (2020: 42–45) remarks, Boisguilbert's employment of numbers is significant, even if the numbers themselves might seem incredible and highly over-estimated. Although they are certainly used as a rhetorical device to sway the reader and convince that the analysis presented is objective, in the present paper we also assume they are partially grounded in fact.

From the political arithmeticians' perspective (Taylor 2005: 55–60), two kinds of numbers are to be used: (1) numbers and raw data, and (2) ratios, i.e. fractions and proportions, where such ratios are used to assess the importance as well as to determine the dynamics of a phenomenon. Boisguilbert shares this perspective: in his work we find both estimations of aggregates as well as proportions and ratios, as the "prices of proportion" testify. In addition to these ratios of proportion, which represent the state of the social order from a static point of view, there are also rates of change of various quantities, that is to say ratios which describe the evolution of aggregates and the dynamics of the society.

We have no explicit textual evidence that Boisguilbert's thinking was shaped by British political arithmetic, and he does not quote any British political arithmeticians. Nevertheless, commentators have underlined certain proximities between Boisguilbert's thought and the representatives of British political arithmetic (see, for example, Magnot-Ogilvy 2020: 42–46; Perrot 1984: 400; Simonin 1996; Reungoat 2018), suggesting that Boisguilbert knew Petty, Davenant and King. Hecht also reminds us that "after the memoir entitled *Factum de la France*, comes the *Réflexions sur l'état de la France* where, following Petty's example for England, Boisguilbert extols the riches and potential strengths of the kingdom" (Hecht 1966a II: 741). The manuscript is kept in the archives of the French Ministry of Foreign Affairs under the reference FRMAE 53MD/1138. – (AFFAIRES INTÉRIEURES, 398.) – 1705). Hecht (1966b: 160–161), reviewing possible points of contact between Boisguilbert and British political arithmetic, notes that Souligné (1697) had partially

translated Boisguilbert's *Détail de la France*, and that this may have inspired Davenant; but she neglects to mention that Souligné in his translation also refers to Petty (1697: 13, 68, 184), which would suggest that he saw some affiliation between Boisguilbert and Petty. According to Hecht, it is probable that in his project to calculate the national wealth of France, Boisguilbert was inspired by Petty and Davenant (1966b: 161).

Even supposing this to be true, with the exception of Petty's writings that were available in France, it remains unknown whether Boisguilbert had read the British authors or how he could have had access to the texts or ideas of political arithmetic. As Taylor recalls (2005: ch. 6), however, scientific ideas could be disseminated through circles of conversation: i.e. not just through published texts, but through learned or literary groups and face-to-face discussions. This was the case in England, especially concerning relations between Gregory King and Charles Davenant, and explains the transmission of ideas from the former to the latter.

Some commentators suppose that Boisguilbert was influenced by Gregory King or Charles Davenant, especially on the question of grain (Hecht 1966b: 160–161, Simonin 1996). We know that Boisguilbert was not closely concerned with the issue of grain volatility until the beginning of the 17th century. In the *Détail de la France* (1695) he does not really address the issue of the grain trade and the gain price; consideration of this issue comes only after 1704, which might suggest a possible influence of King or Davenant (1699).

Nevertheless, King's *Natural and Political Observations* was only published by Chalmers in 1802, while his working journal remained in manuscript form and was only partially transcribed in Evans's article (1967): hence neither writing was in circulation in the early eighteenth century and it is therefore highly unlikely that Boisguilbert was aware of the manuscripts. It seems to us that the only way he could have been aware of the content of King's writings is if he had direct or indirect connections with members of English learned societies, such as the Royal Society, to which King belonged (Taylor 2004: 50).

The influence of Davenant is more plausible. Davenant published his *Essay on the Probable Methods of Making a People Gainers in the Balance of Trade* in 1699, where he quotes King explicitly (for example 1699: 15, 20, 23, 24, 34, 41, 49, 52, 91, 96; and particularly on the question of grain, 1699: 70, 88). Yet, again, a direct influence cannot be entirely established: Boisguilbert does not use Davenant's figures, is not concerned with the question of the consequences of grain price volatility on the deterioration of the trade balance, and does not comment on the appropriateness of public granaries to deal with possible shortages. His only recommendation is that grain should freely circulate and be freely exported. So Boisguilbert's awareness of the high volatility of grain prices could just as well be the consequence of the food shortages that France experienced in 1693–1694 or 1699, which marked public opinion (Simonin 1996: 214). In fine, then, we have no direct proof, nor, in the case of King and Davenant, any textual proof, of the influence of British political arithmetic on Boisguilbert. With Petty, however, it is slightly different.

2.3. The possible influence of Petty's political arithmetic on Boisguilbert's method to assess the French national income

Like Petty (Reungoat 2004: 65–82, 2nd Part), Boisguilbert bases his approach on censuses, but his primary objective is not to determine population size or the rate of deaths and births. Rather, he is concerned by another theme that is also tackled by Petty (especially 1665): the study of the national wealth in order to establish the best tax system. It is for this reason that Boisguilbert advocates the establishment of an income census for tax purposes (1695: 629–632), and his project to reform the French tax system is not far from Petty's own propositions.

Boisguilbert echoes some of Petty's criticism of a bad tax system as set out in his *Treatise of Taxes* (1662): disproportion and inequality (1662: 14–19), vexation, a too-high tax burden, or high taxation on commodities (1662: 16–17). Petty also underlines that a good system of taxation must be grounded on a knowledge of wealth and the population (1662: 16), and must guarantee a willingness to pay tax. In the *Treatise of Taxes* (1662) and in the *Verbum Sapienti* (1665: ch. 5), Petty lays emphasis on the velocity of the circulation of money and its role in the production of wealth, and by extension on the fiscal revenue; this is a theme we will also find in Boisguilbert's writings (1704: 970; 1707b: 844). The necessity of possessing knowledge of the wealth of a nation in order to set up a good taxation system also leads Boisguilbert to propose a method of analysis that takes up the propositions of political arithmetic, and Petty's method in particular.

The choice of the title of Boisguilbert's first book does not seem innocent. While it certainly appears to be a play on words (in French, *détail* sounds the same as *des tailles* – on the taxes on personal wealth – one of the main topics of the book and, for Boisguilbert, the main cause of France's ruin), *détail* may suggest more particularly the approach of political arithmetic. According to the *Dictionary of the French Academy*, "*détail*" refers to commercial practices and to sales in small quantities, while it has a secondary meaning referring to peculiarities and precisions (Académie françoise 1694 II: 526 2nd col – the same meanings being also found in Furtière's Dictionary). *Détail*, in this second sense, is also used in ethical matters, to figuratively denote the particulars and small circumstances of a case. But we can also find a third signification: for *détail* suggests the use of mathematics, "the exact enumeration of the parts" in reference to the details of an estimate, and also means a complete enumeration of the smallest elements of a set. Furtière's Dictionary quotes Pascal, who linked the word *détail* with geometric principles (Furtière 1690 I: 673 2nd col.–674 1st col.), and all three of these meanings are also retained in the *Dictionnaire de Trévoux* (1704 II: np 3rd col.). To conclude, Boisguilbert's use of the word *détail* suggests that he wants to propose a study grounded on particular cases, which goes from the particular to the general, and which makes extensive use of mathematics – or more precisely of "shop arithmetic", to use the terminology employed by Taylor (2005: ch. 4, 6). This echoes the methodology of political arithmetic, particularly that of Petty.

Boisguilbert's methodology suggests the same centrality of empiricism within political arithmetic. He starts from a local empirical observation (the detail), which is supposed to be representative of the kingdom, and then generalizes it to infer the state of the kingdom overall. The details are thus conceived as a proportion of the whole. To know the *Détail* of France, it is necessary to generalize the detail to the whole nation. "By a simple sample one can judge the rest" (*par un simple échantillon on peut juger du reste* – 1707d : 823).

In Boisguilbert's analysis, the crucial *détail* is to be found in a location between Paris and Rouen, in the *Election* (county) of Mantes (specifically, from Mantes to the Pont-de-l'Arche). In this Election, the decrease in the income from the vineyards had caused a loss of 2.4 million livres in the owners' product since 1660. This estimate is based on an "account made, by a just and certain calculation, verified on the spot; and as the incomes in funds, although certainly in advance of those of industry, are not even the fourth part of it, the latter far exceeding them, this makes over ten million in pure destruction on one election alone; and far from the King having gained anything from his fine household, he has lost more than five hundred thousand livres on the *tailles*" (1705b: 885). From this observation, Boisguilbert generalises to the case of France overall, to the national income, and by extension to the king's revenues, because "as this fate has befallen the election of Mantes by a cause general to the whole kingdom, the same consequences can be drawn from it, and we can certainly suppose the same loss for the whole of France" (1705b: 886). Then Boisguilbert infers "a decrease of fifteen hundred million in revenue which has occurred in the kingdom since

1660" (1705b: 886, confirmed in 1705b: 998). This loss being equivalent to half of the French potential annual production, an estimate of 3,000 million for the latter seems apt.

The approach is even more explicit in the *Treatise on the merit and Enlightenments of the so-called clever and great financiers* (*Traité du mérite et des Lumières de ceux que l'on appelle gens habiles dans la finance ou grands financiers*):

> By a simple sample we can judge of the rest: in the Election of Mantes, in 1660, there were sixteen thousand acres of vines, each worth at least two hundred livres of rent; at least half of them have been torn out, thus sixteen hundred thousand livres of loss of income in this region alone, and the remaining eight thousand, which are abandoned even every day, are reduced by half, which forms another eight hundred thousand livres of loss, the whole amounting to two million four hundred thousand livres on a single commodity in a simple election. Now, as property in funds is not the sixth part of the faculties in general, the income from industry surpassing them by far, and as the vines do not even form nearly all the product of the lands, and that the whole has suffered the same fate, it is more than two [there may be a typographical error here: normally according our calculus below it would be 10: *dix* and not *deux*] million per annum of diminution on a single county, which does not compose the hundredth part of the kingdom.
>
> And as the evil has come about through a general and not a singular cause, one can with certainty draw the same reasoning with regard to the rest of France. (1707d: 823)

Boisguilbert also uses this kind of approach to estimate the evolution of the revenues of the kingdom from an "infinite number of large estates belonging to people of the highest consideration" (1705b: 894). We can estimate the approximate ratios between wealth, revenues and taxes as they are set out in Boisguilbert's writings, and these are illustrative of his method.

From particular to general: ratios and deductions

Ratio between:	Détail	General	Amount of the ratio between the détail and the general	Deduction
The diminution of the revenue of: (1705b: 885)	Mantes's vineyard 2,400,000	Mantes's Election Over 10,000,000	x more than 4	loss of Mantes's revenue 12,500,000 (10,000,000 + 2,400,000)
Amount of the: (1705b: 885)	Revenue of the lands 1	Revenue of industry More than 4	x more than 4	so, the loss of Mantes's industry revenue should represent 10,000,000
Amount of the: (1707d: 823)	Revenue of the landowners (*Biens en fonds*)	General revenue (*Facultés en general*)	x 5 "less than six"	5, 2
Amount of the: (1705b: 885)	Loss of the *tailles* in Mantes 500,000	Loss in the revenue of Mantes's Election 10,000,000 or 12,500,000	x 20 or 25	So, the *tailles* should represent 4 or 5% of the general revenue in Mantes (and in general)
Amount of the: (1705b: 885)	Loss of the *tailles* 500,000 in Mantes	Revenue of the lands 2.4 million	Around x 5	So, the *tailles* should represent 20% of the revenue of the lands
Amount of the loss of the revenue of: (1705b: 886)	Mantes 10,000,000	Kingdom 1,500,000,000	x 150 "More than 100"	So, the loss of the *tailles* in the kingdom should represent 75,000,000
Amount of: (1695: I ch. 7, 588, 1705c: 723, 1705b: 885, 888, 891, 892, 895, 897, 920, 923, 928, 951, 1707f: 1019)	The revenues of the Crown 115,000,000 *By comparing 1695 and 1705 estimates, is this an indirect criticism of Louis XIV, of his war policy and of the increase of the tax burden?*	The revenues of the kingdom 1,500,000,000 (decrease of this amount equivalent to the half of the revenue, so it remains 1,500,000,000)	x 13	So, the *tailles* should represent 65% (2/3) of the revenues of the Crown
Amount of: (1705b: 885)	The revenues of the Crown 150,000,000	The revenues of the Church 300,000,000	x 2	

By referring to the influence of Boisguilbert's political arithmetic, then, we can come to understand why he would have believed that the wealth of France had decreased by 1,500

million. The figure is obtained from the sample that is Mantes, representing less than 1% (2/3%) of the area of the kingdom. But while the numbers appear overestimated, they are nevertheless logically constructed and obtained from a method that claims to be scientific. We also see that the tax rate is relatively low: it affects less than 10% of wealth (1/13) and is therefore lower than the *Royal Tithe* proposed by Vauban. If the tax burden seems too high it is because the tax system itself is unjust, inefficient, parasitic and paralysing: it is borne only by the poorest classes of the population. It is also because the wealth of the Kingdom of France had diminished by half since 1660. Were the wealth restored, the tax burden would represent less than 5% (1/26). Finally, we can also perceive a criticism of the Catholic church. The Catholic church has twice the income of the king (1705b: 885), and would therefore be in receipt of two tenths of the wealth of the kingdom. The Church had thus taken over a substantial part of the king's properties, explaining the necessity for a reformed tax system (1695: 591). The catholic Church appears therefore as Boisguilbert's hidden target.

To conclude, Boisguilbert's method is similar to Petty's, yet his empiricism is clearly rather awkward. Boisguilbert doesn't specify how he arrived at his estimation of the levels of the rents in the Election of Mantes; nor is he precise about how he deduced the ratios between his local data and the kingdom's situation overall; and, finally, his method pretends to be empiricist whereas it is essentially grounded on deductions and imprecise estimations. Boisguilbert does not seem to have make any real empirical study: he only takes one dimension, and presupposes that there are fixed ratios between wealth, revenues and taxes. But as early as 1695 he allows the reader to suppose that he has made precise surveys.

> The loss of half of France's commodities in general being constant, for the reasons we have just discussed, although the reduction of this loss or estimate to a certain price is an indifferent thing in itself, nevertheless, we have been kind enough to make a supputation of it, by very long and very exact research. (1695: 585).

The supputations themselves certainly exist, but the "very long and very exact research" on which they may have been founded is not set out – if it took place at all.

Boisguilbert's estimations of the wealth of the French kingdom are also confirmed by another manner exposed in his *Factum de la France*. According to Boisguilbert,

> As we count the income of a house, a farm and a village, as much in its decreases as its increases, it is easy, for those who are experienced in these matters, to calculate the income of an entire kingdom. We have done this for England, which is not worth the quarter of France, all things considered, working with or rather being governed by the same maxims, and we claim that it goes to nearly seven hundred million per annum. (1705b: 885).

This quotation is suggestive in various different ways. (1) The mention of the calculation of the income and wealth of England may be an implicit reference to the British political arithmeticians. The target could be Petty (although in Petty England's annual production is estimated at 15 million (1664: Ch. 1. 13), the difference may be explained by the exchange rate). Hecht (1966b: 160), meanwhile, suggests that Boisguilbert could be referring to Davenant (1695), who estimated the British income at 43 million.[1] But according to Hecht (1966b: 160–161), who relies on Boisguilbert's correspondence (22 July 1704 in Hecht 1966a I: 324), it is more likely that he is here taking up Dubos's estimation, even if the latter puts the national revenue at 600 million (Dubos 1703).[2] (2) We note that according to Boisguilbert,

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[1] We have not found this estimation in Davenant's book. According to Hecht, Boisguilbert would therefore use an exchange rate of 1 to 16 between the pound sterling and the pound tournois. But Davenant (1695: 22) seems to use an exchange ratio of 1 to 12.5.

[2] We have not found this estimation in Dubos's book.

England is better governed and proportionally richer than France. (3) England's higher annual income is estimated to be 700 million. (4) All other things being equal, France, if well-governed, should be four times richer and more powerful than England, with an income of 2,800 million per year (nearly 3,000 million, the number used by Boisguilbert). (5) Boisguilbert echoes the rivalry between England and France that Petty emphasized (1690). (6) In any case, the initial estimate of France's annual production is based on that of England, using a ratio of 4 if France were well-governed, and a ratio of only 2 for the badly governed France of 1705.

Overall, Boisguilbert's approach is broadly similar to that of Petty. As we saw, he deduces general numbers and aggregates from the local data, the same method Petty uses to estimate England and Ireland's population and wealth (see, for example, Petty 1664, 1690, Reungoat 2004: ch. 5). Nevertheless the main difference with Petty's method is that Boisguilbert does not really try to collect any local empirical data. He thus proposes a specious political arithmetic, based on imprecise and vague estimates, on crude deductions, and on the idea that pre-existing ratios govern the relationships between sectors, incomes, taxes and growth rates.

3. The possible influence of an embryonic economic analysis using arithmetic in France to assess the effects of inflation and reveal the bad order of the kingdom

While Boisguilbert may have been influenced by British political arithmetic, he also seems to have been inspired by French quantitative analysis. Boisguilbert's approach could be compared to Vauban's. Vauban's method, which is similar, is based on the square mile (*la lieue carrée*), whose local production, generalized to the kingdom, is intended to provide information on national production (Vauban 1707; on Vauban's approach, see also Le Roy Ladurie 1968: 1086–1087 note 2). Vauban could therefore have influenced Boisguilbert. While Boisguilbert does not quote from British political arithmetic, he does quote Vauban once, and cites his project of a *Dixme royale* (1707), though criticizing it on the grounds that the tithe is to be paid in money and not in kind (1705b: 945). Boisguilbert knew Vauban's work and might know his approach was inspired by political arithmetic. According to Meyssonnier (1989: 36), Vauban and Boisguilbert even met in December 1694, thus just before the publication of the *Détail de la France* (1695). Nevertheless, relying on Virol's analysis (2003 Part IV), and on Vauban's quotations, it seems that Boisguilbert would himself have influenced Vauban more than he may have been influenced by him.

While Vauban's influence on Boisguilbert seems unlikely, it is much more likely that Boisguilbert was influenced by another kind of use of arithmetic in politics that was in fact to be found in France. Even if he did not quote him, it seems to us that Boisguilbert used Scipion de Gramont's *Denier royal*, published in 1620 (for a presentation of Gramont and the *Denier royal*, see Chantrel 2014). Gramont is undoubtedly one of Boisguilbert's major sources of inspiration (the idea is shared by Faccarello 1999: 84), and some of Boisguilbert's discussions can be located in the ongoing controversy, initially between Jean de Malestroit (1566) and Jean Bodin (1568), which inspired Gramont's analysis to take into account the effects of inflation and clear up the monetary illusion of which his contemporaries were victim.

3.1. The influence of Gramont on Boisguilbert

Gramont may be inscribed in a tradition which can be termed "scholarly libertinism" (*libertinisme érudit*) (for a general presentation, see Pintard 1943, Moreau 2005). The aim of this tradition is to clarify phenomena by appealing to empiricism, observation of facts and

logical reasoning, so as to challenge common beliefs and popular errors. In his *Denier royal*, Gramont engages in a historical investigation that seeks to evaluate the evolution of the French kings' income by considering the effects of inflation. His political aim is to praise Louis XIII and Richelieu and to show that the tax burden, estimated in constant currency, had not increased: indeed, contrary to public perception, the real income of the king had stagnated. According to Michel Foucault, by considering the effect of inflation Gramont opened up a new scientific era in the history of economics: that of the age of representation, which distinguished real prices (and thus the value of things or wealth) from current prices expressed in monetary value (Foucault 1966: 180–192). This new awareness allows Gramont to call into question beliefs born of monetary illusion, whether they relate to the evolution of economic quantities or to the distribution of wealth, which inflation affects. Even if tax reform should prove necessary, according to Gramont, the king could not be held responsible for the increase of the tax burden. Claims that the tax burden was increasing would be an error of appreciation based on monetary illusion (see Chantrel 2014: 48–53). For Gramont, the king, on the contrary, remained clement and benevolent with his people.

Gramont's positions find an echo in Boisguilbert's thought. Boisguilbert's aim in the *Detail de la France* is to show that

> the loss [of wealth in France] is not the effect of an increase in the King's revenues over forty years, but rather because, having never seen so little increase in such a period of time, for about two hundred years, the revenues of the people, far from decreasing, as they have done, doubled in the same period, which was the cause of the increase of those of the King. (1695: 586)

There are also other proximities. Certain estimations are the same between the two authors. For example, like Gramont, Boisguilbert estimated the French population to be 15 million (1620b: 198, Boisguilbert 1695: 625, 1705a: 788, 1707b: 855, 1705b: 926). Like Gramont, wealth for Boisguilbert is distinct from money or from the monetary valuation of goods: "wealth is nothing other than the power to procure the convenient maintenance of life" (1705c: 698). The two authors also had similar views on money: for Gramont, "the necessity of gold and silver is not based on nature, but on the will of men" (Gramont 1620b: 105). It had, therefore, been introduced by men to facilitate exchange, and metallic money is essentially conceived as a pledge (1620b: 105). The forms of money can be varied, recalling some of the examples, such as shells, that Boisguilbert cites (Gramont 1620b: 109; Boisguilbert: 890, 976–977). Money is also conceived as a flow crossing the flow of goods of which it is the counterpart. And Gramont also criticizes Malestroit and Bodin for confusing nominal price increases with dearness, for they thus confuse the measurement of wealth with wealth as such (Chantrel 2014: 22)

Although he does not take up the Malestroit and Bodin controversy, the consideration of the effects of inflation is also one of Boisguilbert's themes, as we shall see. Similarly, although his analysis remains more summary, Boisguilbert tries to estimate the evolution of prices in the same way as Gramont, based on the evolution of the wage of the labourer and the prices of goods (for a synoptic presentation of Gramont's approach, see Chantrel 2014: 32–36). The prices based on which Gramont seeks to estimate inflation are also similar: grain, wine, labourers' wages, but also capon – although Boisguilbert prefers partridge. As with Boisguilbert, the general increase in prices is explained by the increase in the amount of money in circulation or by the influx of silver. And neither author considers money to be neutral, for it generates illusions and engenders transformations in the distribution of wealth. Unlike Gramont and Mallestroit, Boisguilbert does not embark on a study of the evolution of the value of metallic coins according to their content; nevertheless, he adopts the same

perspective as Gramont by trying to evaluate inflation via the purchasing power of money and of wages expressed in commodities.

They also treat fiscal matters in a similar way. Like Gramont, Boisguilbert was interested in the French tax system, and both criticised *la taille* (a direct tax on personal wealth initially set to finance war and the royal army) (Gramont 1620b: 172, 198), the inequality that characterised it, and the impoverishment that it caused. However, Boisguilbert did not assume that peace had first to be established in order to abolish the *taille* (1620b: 201), and spoke out against "the claimants of delay" (*les demandeurs en delay*), the subtitle of the *Factum de France* (1705a). Gramont was also in favour of a proportional tax, and "assigned the king the responsibility of enumerating men and wealth […]. The king must be able to proportion the tax burden between provinces and between people, the strong bearing the weak, in accordance with the principles of geometric or harmonic justice" (Chantrel 2014: 45; Gramont 1620b: 197). Gramont was critical not so much of the burden of the *tailles* as its unequal distribution (1620b: 197); he also called into question the behaviour of the officers charged with collecting the *tailles*, as well as the fact that they did so in the service of the richest. Both Boisguilbert and Gramont were in favour of universal and proportional taxation; but unlike Gramont, who sought to defend Louis XIII, Boisguilbert was much more critical of the monarchy of Louis XIV. And finally, Gramont, like Boisguilbert, is in favour of grain exports and does not blame them for the general dearth of food, nor for the shortages (1620b: 141–144).

By reviewing his method and noting certain textual proximities, we may surmise that Bosiguilbert was partially inspired by Gramont. This is particularly the case with Boisguilbert's study and evaluation of prices, wealth and, by extension, of the real fiscal resources of the monarchy.

Boisguilbert proposes a kind of quantitative history of the French kingdom in which he reflects on prices and the differentiated consequences of inflation upon them, and by extension on the distribution of wealth in the kingdom. According to him, inflation generates illusion: it leads people to believe that the king's income and the price of grain have increased, whereas in fact they have decreased. "Gold and silver are not and never have been wealth in themselves, are only valuable in relation to each other, and in so far as they can provide the necessaries of life, to which they only serve as a pledge and appreciation, it is indifferent whether they have more or less, provided they can produce the same effects" (1695: 588). To make these calculations and compensate for the effect of inflation, Boisguilbert uses different sources. Although he claims to rely on the same sources as used for the estimations of the state revenues, we don't find the same data in Commynes's, Mézeray's, Amelot de Mauregard's or Sully's writings, which, moreover, show little interest in the state revenues. Boisguilbert also relies on "old registers of 1250" for the daily labour wage (1695: 588), on "old registers of the end of the 15th century" ("un maître maçon qui gagnait quatre deniers par jour, il y a trois cents ans, dans Paris, comme l'on voit par des registres publics de ce temps-là"). Boisguilbert might have found the estimation in Bodin (1578: sp. 12th p., although the precise date is not given and seems to be around the beginning of the 16th century). The source of the estimations of the price of grain is not mentioned (1695: 588). So, the main sources of Boisguilbert's data remain unknown. Finally, Boisguilbert relies also on his personal experience gained from his duties as police lieutenant. In particular, he describes the methods of collection of the *tailles* and the vexations they engender (for example 1695: 591–597). The prices corresponding to his time or to that of the 1660s come from his personal knowledge of everyday life.

3.2. Prices, inflation, taxes and revenues of the kings of France

Like Gramont, Boisguilbert sought to challenge popular errors, and he indirectly contradicts the positions of Malestroict (1566) and Bodin (1568), whom he sees as victims of common sense and monetary illusion (on Gramont's positions and on his critique of Malestroit and Bodin, see Chantrel 2014). Boisguilbert takes up Gramont's distinction between price and dearness. Prices refer to the valuation of goods; dearness to the purchasing power. If the population does not vary and if production increases, purchasing power also increases and dearness decreases even if nominal prices have increased. This is why inflation and the variation of prices have to be considered. Current prices have to be deflated. In this respect Boisguilbert relies on rudimentary estimates of the evolution of workers' wages or grain prices, and then sets out what he presents as the king's revenue in current value, although we don't have the sources of his estimations.

Boisguilbert considers that the revenues of kings have not increased, not since Charles V (1364–1380) as Gramont suggests, but indeed since 1250 and the reign of Louis IX (Saint Louis, 1226–1270), and emphatically so since 1582 and the reign of Henry III (1575–1589). He also concludes that the king's revenues have in reality decreased since François I (1515–1547).

Estimates of the king's revenues
(1695: chs. 6, 7, and 1705b chs. 6, 7)

Date	1250 Louis IX	1461 Louis XI	1487 Charles VIII	1525 François I	François I probably after 1525–1547	1559 Henri II	1582 Henri III	Henri IV 1589–1610	1624 Louis XIII	1642 Louis XII	1660 Louis XIV	1695 Louis XIV
Price index Based on daily wage and grain prices	100 →			x 20	666		2,000 → x 15 (1705b: 904)		x 5		5,000 → x 2	10,000
Daily wage (1695: 588)	4 deniers by day →			x 100 according to Boisguilbert ; x 150 according to his highest estimate								40 to 50[3] sols by day
Grain prices (1695: 588)							8 sols for one measure of grain →		x 5			40 sols for one measure of grain
Tax levies in current millions		1, 8	4, 7	9	16	16	32 or 35	35	35	70	85	112 or 115
Tax levies in constant millions					240 → x 2/3 around (1705b: 904)		175 → x 2/3 around (1695: 588)					112 or 115 (1695: 588)

The contemporary situation, in which Boisguilbert was writing, was characterized by an increase in the current tax levies of one third compared to 1660 despite a decrease of half in the national income (1695: 587). About half of this one-third increase is explained by the increase in the tax burden, and the rest by the increase in the national territory, which had

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[3] 1 sol = 12 deniers.

expanded by a tenth (1695: 587). Nevertheless, as the current tax levies had increased by one-third in current value, prices had doubled since 1660 (1705b, ch. 2). In conclusion and in constant value, the tax levies had decreased between 1660 and 1695, despite the higher tax pressure. As real production had halved during the same period, this higher tax pressure is all the more important in the context of the general impoverishment of the kingdom.

During the reign of Louis XIV, the current tax levies had increased but the real tax levies had by contrast decreased. The real tax levies were indeed at their lowest since at least the time of François I. This was a symptom of the French economic malady. Worse, whereas under François I all the tax went to the State budget, only 1/20 was available to the royal administration under Louis XIV. According to Boisguilbert, the remaining 19/20 was captured by 100,000 people who had, in opposition to the king, a direct financial interest in the French tax system (1705b: 901, 907).

While Gramont wanted to show that the ageless complaint of the people concerning the increase of taxes was the consequence of monetary illusion, Boisguilbert perceived two additional causes. (1) Generally speaking, the burden of taxes seems to be heavier as a result of the decrease in the kingdom's wealth, which explains the justified perception of a higher tax pressure. (2) The tax burden seems too high because of an unjust tax system that particularly affects the ploughmen and the countryside (1695: 591). The French fiscal system is also inefficient because most of the tax levies are captured by members of the tax administration.

By using quantitative estimations, Boisguilbert condemns the reign of Louis XIV both because of the inefficient fiscal system, and because of the economic framework, which was responsible of the loss of half of the national wealth. But Louis XIV himself had not become richer, unlike those 100,000 *traitants* and *financiers* (1705b: 901, 907).

3.3. Prices, differentiated inflation, and the bad price of grain considered as causes of French decline

Using the calculations of the evolution of prices, Boisguilbert also wishes to highlight a second consequence of the monetary illusion: the people thought grain was more costly, whereas its real price had in fact decreased since 1660, and even more so after 1700, i.e. after the shortages of 1693–1695. Contrary to popular belief, the shortages of 1693–1695 should have contributed to re-establishing the good price of grain. But the new grain police regulations, adopted to cope with the shortages, had established a grain price that was in bad proportion. By early 1700, grain was being sold at too low a price, at only half of its supposed proportional price.

The question of the price of grain is not central to *Détail de la France*, which is more concerned with examining the fiscal and financial system. In fact, Boisguilbert seems hardly to be aware of it. In the *Détail*, current grain prices are supposed to have increased in line with wages and other prices, and are said to have increased fivefold since the reign of Henry III (1695: 588). The grain problem indeed is only mentioned briefly in the *Détail*, in the context of price volatility, which is considered to be detrimental to the population and to the production of wealth, and which is related to the state of the harvest (1695: 615), but also to the marketing structures for grain. Boisguilbert underlines that the grain market is very volatile, given the nature of the merchandise and the nature of the actors (1695: 610). He also points out that foreign merchants no longer come to France to obtain supplies, which contributes to keeping the price low (1695: 615). But in the *Détail*, Boisguilbert doesn't specifically consider the consequences of the volatility of the grain prices.

The perspective changes with the *Traité de la nature, culture, commerce et intérêt des grains*, which was composed as early as 1704 (Hecht 1966 II: 827 note 1). As the title indicates, grain now becomes Boisguilbert's main focus. Nevertheless, it should be noted that the issue of grain remains second as a cause of France's decline, whereas the tax system is held responsible for a decrease of more than 1,000 million in revenue (500 million for the *tailles* [1705b: 934], 800 million for the *aides* (consumption taxes) and the *traites* (custom fees) [1705b: 928]). By comparison, the hindrances to the trade of grain seem less harmful to the wealth of France, being estimated at 250 million (1705b: 934) and later rising to 500 million (1707f: 1014). In his reflections on grain, Boisguilbert seeks to show that from the end of the seventeenth century, the constant price of grain had decreased, in contrast to the prices of manufactured goods. Moreover, the prices of proportions would be broken, leading him to conclude that the price of grain was too low.

To make his comparisons, Boisguilbert refers to the ordinances of Henry II of 1549 (1707b: 833). He estimates that grain was then at a good price, i.e. 20 sols per setier in 1550 (1707b: 833). For 1600, he refers to common knowledge that the setier was worth 3 livres 10 sols in the common year and a pair of shoes 15 sols (1707b: 833). As all the prices had tripled, the proportional prices had been maintained in 1600 (1707b: 833). For these reasons, in this period "the worker could not complain about buying his grain for three times as much, just like the shoemaker, who sold for fifteen sols the same shoes that he had sold for five in the days when grain was worth three times less" (1707b: 832). The same held in 1650: the grain price was 10 or 11 francs per setier, and so had tripled compared with 1600, but all prices had tripled during the period, "Namely, that shoes which were worth fifteen sols at that time [in 1600] were sold in 1650 for forty-five and fifty sols, and everything else in proportion" (1707b: 833). In conclusion, the proportionate prices were still extant in 1650. The disjuncture would have taken place in the second half of the 17th century, and specifically at the end of the century.

> And as in the year 1700 and the following ones in which we are living, all these same commodities, except grain, have assuredly doubled by causes that are very natural, and concerning which we will dedicate a separate chapter, and which are none other than the floods of silver that every day arrive in Europe, we quietly accept that all kinds of goods should take their share of the increase in price, as they have always done since the discovery of the New World; but this justice is denied to grains alone. (1707b: 833)

According to Boisguilbert, by considering inflation, the good current price of grain should be around 18 or 20 livres per setier: in fact it was only 9 or 10 livres in 1700 (1707b: 834). The grain price is therefore disproportionate; half what it should be.

Effects of inflation and the estimation of the good price of grain (1705b, ch. 2)

Date	1550	1600	1650	1700
Price of shoes	5 sous x 3 →	15 sous x 3 →	45 to 50 sous	100 sous or 6 francs
	x 20 →			x 2 (around) →
Grain price. Price of one setier of wheat	20 or 21 sous →	3 livres 10 sous →	10 or 11 francs	The good price: 20 or 22 francs; 18 or 20 livres
	x 3 (around)	x 3	x 2 (around)	The actual price: 10 francs or 9–10

				livres[4]
Daily wage of an agricultural worker	8 to 16 deniers	x 12		8 to 16 sous

Indirectly, it is also apparent that the daily wage of the agricultural worker had not sufficiently increased since 1550. Like the grain prices, the agricultural wage had not taken into account the price increase between 1650 and 1705, and the agricultural worker was now suffering from the sectoral disproportion of wealth created by the bad and low price of grain. If we compare the agricultural wage with the wage of a Parisian worker (1695: 588), the latter would be earning at least three times as much (8 to 16 sous compared to 40 to 50 sous), which shows the disproportion of wealth in favour of the manufacturing sector.

The decline of the French kingdom would therefore also be caused by a disorder in its economic framework which goes unperceived due to the monetary illusion. Thanks to his calculus Boisguilbert is now able to reveal the truth and to justify his criticism of the reign of Louis XIV as part of the necessary reforms he is calling for.

4. Concluding remarks: The disruption of the good order and the order of interests

We have shown the influence of political arithmetic and quantitative analysis on Boisguilbert's thought, and more particularly that of Petty and of a French economic stream, notably Gramont's analysis. These sources assist Boisguilbert in finding an objective basis, based on quantitative data, for his condemnation of the reign of Louis XIV, as well as criticising the illusions of his contemporaries and revealing what their true interests are in order to reconcile them with the general interest of the kingdom. Boisguilbert could thus be considered as one of the French pioneers of quantitative analysis both in economics and economic history.

During the reign of Louis XIV, the good order had been disrupted by the prevalence of monetary illusion; by an unfair, inefficient and vexatious tax system; and by disproportionate prices. All of these factors had led to the breakdown of the social and economic order, whose structure was now deformed and ill-proportioned. The monetary illusion had made these malformations possible. The actors within this society were not even rational, for they were unaware of the illusion that beset them. Market processes or bargaining could not dissipate the monetary illusion; quite the contrary, the illusion allowed certain classes, and particularly the urban classes, to justify a distribution of wealth that was favourable to them, and to promote their personal interests against the general interest. Among these urban classes, the profiteers of the fiscal system are particularly condemned. Their greed, avarice and personal interest had led to the ruin of France. Because of these characteristics, the society of Louis XIV was therefore ill-formed.

From this perspective, certain economic structures or regulations had to be put in place so that the good order desired by Providence could be brought into effect. We think it is through this prism that Boisguilbert's critique of the France of Louis XIV should now be re-evaluated. It seems to us that Boisguilbert desires a return to the pre-existing order of nature and good proportions following God's will. To achieve this, the king and all his subjects must be made aware that only a self-interest enlightened by an awareness of the characteristics of the natural order of societies will contribute to the general interest. Louis XIV, and France as

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[4] Boisguilbert seems to operate a conversion on the basis of 1 franc = 1.2 livres.

a whole, must submit to the wisdom and the will of God. Boisguilbert may therefore be understood as in favour of the pursuit of *enlightened* self-interest: he is essentially a thinker of a pre-existing order that is to frame and shape individual interests, and that otherwise a society is condemned to fall.

Such a re-evaluation will certainly show that Boisguilbert is a defender of order and of the interests that may be inscribed within that order. As with Nicole (see for example 1670: 169–170), "self-interested exchanges function properly only when they are framed by the political order, which by force of law constrains the fundamental violence of self-love" (Guion 2004: 59). Boisguilbert believes essentially in a natural pre-existing good order to which men have to bend, or else risk economic crisis. To prevent crisis, it would be necessary to restore the structure and proportions of the good order. But this would presuppose knowing it. Finally, Boisguilbert seeks to reveal the good prices and the good order and to fight against illusion and error. The truth, having been revealed by quantitative analysis, had to be proclaimed.

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autrement de la conjoncture présente. In Hecht. J. (ed). *Pierre de Boisguilbert ou la naissance de l'économie politique*, Paris: INED, 1966, Vol. 2, 879–956.

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