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Conversing about Dante

Civic passion, public life, economic reasoning¹

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Dante and the economy

For this speech, I intend to draw inspiration from several passages of the *Commedia*² to formulate some arguments as an economist, which I will use towards the end to make a couple of free observations about one of today's great problems. I hope that you will forgive me my unavoidable incursions into a field that is not mine and I shall try not to go beyond the bounds of this task. I leave discourses on literature to others. At best, I can invoke my passion for the subject, certainly not my competence.

It is clear that the science of economics in the modern sense did not exist in Dante's day, although of course the economy as a fact did exist. It was not that economic reasoning was entirely lacking, at least from Aristotle onwards, rather that the analytical tools potentially available to observers at that time were very different from those of today. Today, through the lens of a subject that came into being several centuries later, we see it in a different way.

If we look through this lens, one fact stands out. Dante seems not to have noticed the impressive acceleration that society was experiencing at that time. Or better, to the extent that he did notice, he only saw the negative aspects.³ "*La gente nõva e i subiti guadagni*"

¹ I would like to thank Alfredo Gigliobianco for helping me to write this text, Paolo Angelini and Ivan Faiella for reading it and making suggestions, and Ignazio Visco for his many useful remarks.

² Ignazio Visco set out a broad overview of the transformations of the economy and of economic thinking in Dante's time in a recent speech ('Notes on Dante's economy and events of our times', Banca d'Italia, 2021). I deal with a less ambitious topic here: the reading of some extracts chosen from the *Commedia*, in the spirit of the title of this conversation ("Civic passion, public life, economic reasoning"), using some of the intellectual instruments available to economists seven hundred years on.

³ In Dante's radical refusal of the mercantile society emerging at that time, M. Romanelli (*Leconomia di Dante. Mercato, profitto, dono*, Longo, 2021) sees an intellectual position that is anything but unaware or reactionary, but rather dictated by a 'grand project for the regeneration of humanity'. We do not disagree; if anything, we express doubts, as befits economists, over Romanelli's positive assessment of this vision.

("The new people [newly rich] and the rapid gains")⁴ aroused his indignation. Fiorenza (the poetic name for Florence) "*dentro della cerchia antica*" ("within the ancient circle", that is to say of the golden days of Cacciaguida, Dante's forefather) "*si stava in pace*" ("dwelt in peace"), because it was "*sobria*" ("sober" i.e. content with a modest way of life); the problems all begin when people start to desire more material goods.⁵

At the beginning of the fourteenth century, Florence was on the verge of becoming the economic and cultural centre of Europe. The extent to which economic development counts in the creation of an environment favourable to cultural development is sometimes underestimated. Certainly, the issue never even occurred to Dante. Over the course of a century, the wealth of his city, which came from extraordinary growth in trade and manufacturing, nourished Humanism and the Renaissance, and bred and attracted some of the most celebrated artists and intellectuals of all time. Yet Dante focused on the offensive "*puzzo*" ("stench") of people from rural areas who were invading the town.⁶ He did not grasp the contribution that these new arrivals could make in terms of work and ingenuity, nor did he perceive the multiplier effect of urban development on economic and cultural growth.

After all, the very concept of development as we understand it today was missing. Nobody living at that time, if they were literate, could fail to notice the civic renaissance of Europe following the "*etadi grosse*" ("crude [dark] ages"),⁷ but if they had ever wondered, they would probably have said that the most they could aspire to was a return to the magnificence of the Roman imperial age. Actually, on observing the course of human history, perhaps the metaphor of a fall (from an earthly paradise or from the golden age)⁸ might have come to mind more naturally than that of an ascent – obviously without prejudice to the expectation of a dramatic and glorious conclusion to the story of the material universe in the forms of Christian eschatology.

In this context, the principles inspiring the government of society had to try to establish an ideal order, not to promote growth; they were static and axiomatic, not dynamic or empirical. So it was for Dante.⁹

Avarice

It could be said that it is easy to perceive the limits of this point of view when you have seven extra centuries of experience and thinking behind you. This is true, in the sense that we know more nowadays, but not in the sense that this line of reasoning no longer

⁴ *Inferno*, XVI, 73. Here and elsewhere, the English translation is taken from *The Divine Comedy of Dante Alighieri*, edited and translated by Robert M. Durling, New York-Oxford, Oxford University Press, 1996-2011.

⁵ *Paradiso*, XV, 97ss.

⁶ *Paradiso*, XVI, 49-57.

⁷ *Purgatorio*, XI, 93.

⁸ *Purgatorio*, XXVIII (especially 94-96 and 139-141), where the two myths become one.

⁹ Not everyone would agree with such an outright statement. It seems to me that it is written clearly, especially in the *Commedia* and in the *De Monarchia*. Yet I am certainly not qualified to have the last word on the subject. It is to be taken for what it is: the impression of a keen but not expert reader.

presents any difficulties. Certain concepts remain fairly counterintuitive for human beings in the twenty-first century too.

Let us look at the theme of greed or avarice, symbolised by the famous she-wolf, which appears in the first canto of the *Commedia* and returns several times.¹⁰ In Dante's view, those who wish to become rich are despicable because they are greedy, they do not obey the Commandments and they are stained with a capital sin: that is all.

Those who see making money as their only purpose in life were not liked then and are not liked now. The economist, however, tends to make some distinctions. It is one thing to behave as Ebenezer Scrooge does in Dickens' *A Christmas Carol*. It is quite another to pursue one's legitimate interests honestly when carrying out any business activity, as we probably all do, whether in production or in trade.

A cardinal concept of economics as a science is precisely that, in looking to their economic interests, a person contributes to society's economic well-being. (There are exceptions, as we shall see later on). This concept, which is hard to understand and easy to misunderstand, was established, as everyone knows, by Adam Smith in his masterpiece *The Wealth of Nations*: "It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest".¹¹ There are two elements at the heart of this. The first was already clear to Aristotle, who was a cultural cornerstone in Dante's day.¹² Everyone needs other people in society: the poet (definitely) needs the shoemaker, while the shoemaker (hopefully) needs the poet. This interdependence arises from specialisation, which makes the production of all goods more efficient. The second is that trade is advantageous to both parties. Aristotle at most caught the odd glimpse of this,¹³ as he was more interested in the fairness than in the efficiency of trade. Trade is still often perceived as a battle a contest in which, if one of the two participants earns something, the other one inevitably loses. Smith demonstrated that it is not really like that. If the baker parts with a loaf in exchange for a shilling, he does so because it benefits him. The same goes for the customer: if he pays a shilling, it is because he finds it more convenient than mixing the dough and baking the loaf himself. The baker earns money from his business activity, but at the same time provides the customer with an efficient service. If we broaden the analysis from the individual to the community and include competition, we can conclude that an economic order based on decentralising decisions and on each person pursuing their own legitimate interest increases everyone's well-being. That is all, yet the modern science of economics springs from this basic insight.

¹⁰ *Inferno*, I, 49ss.; *Purgatorio*, XX, 10 ("Maladetta sie tu, antica lupa!", "A curse be on you, ancient she-wolf"); and perhaps also *Purgatorio* XIV, 50. Many commentators see something more than just the sin of avarice in the cupidity of the she-wolf; here, purely for illustrative purposes, I adhere to a circumscribed interpretation of the relative symbolism.

¹¹ *The Wealth of Nations*, Book I, Chapter 2. Although his vast and systematic work is often considered as the founding act of economics, Smith was not actually the first to set out this concept. Anders Chydenius from Sweden was ahead of him here, and his pamphlet '*The National Gain*', was published a few years before Smith's book. However, the history of thinking is dotted with similar ideas, from ancient times onwards.

¹² *Nicomachean Ethics*, V.

¹³ If nothing else, Aristotle, albeit in his own somewhat convoluted way, eventually took up the cudgels for the right of private property, considering it from the point of view of incentives (*Politics*, II, 5; and elsewhere).

Contrary to the caricature that is sometimes drawn, *homo oeconomicus* is not inherently selfish, greedy or deaf to the things of the spirit. We can assume that people maximise profits in the sense that we expect that in their business, they will seek to garner resources as best they can: resources to live, to support their families and perhaps even to enjoy life. If they are as greedy as the she-wolf, they will amass them shamelessly but, if instead, they are generous and sensitive, they will also help others, support worthy causes or sponsor art and culture and what have you. The actions of *homo oeconomicus* are to be seen as a means, not an end; each person decides their own end, and as long as the means is honest, it is the end, not the means, that is subject to a moral judgement.

Could Dante have grasped similar concepts regarding the role of incentives in promoting economic activity? Poggio Bracciolini, another illustrious Florentine writer, got there just over a century later, during the full flowering of Humanism; in a dialogue of his on avarice, he had one of his interlocutors argue as follows:

Quod si ita est, ut omnes cupidiores pecuniae appellentur avari, censebuntur rei hoc nomine fere omnes. Omnia enim ab omnibus agenda suscipiuntur pecuniae gratia, ducimurque omnes lucri cupiditate, neque eius parvi, quod si sustuleris, negocia operaque omnia penitus cessabunt. Quis enim quicquam aget, remota spe utilitatis?... Illam sequuntur omnes, illam appetunt. Nam sive rem militarem, sive mercaturam, sive cultum agrorum, sive artes has, quas vocant mercenarias, consideres; sive etiam quas appellant liberales; videtur singulis praeposita esse ingens pecuniae cupido... Quid enim, ne de vilioribus exercitiis loquar (quorum late patet finis), leges in vita tractantes aliud ducit, quid aliud trahit nisi pecuniae cupiditas non parva, et uberius lucrandi facultas? Quid item medicos, quid reliquos qui se ad liberalium artium studia conferunt? Confer te ad sanctiores disciplinas, philosophiam, theologiam: sciendine causa an plurimum lucrandi tanta ponitur in his edocendis opera?... Quicquid inter mortales tractari vides, quicquid periculorum suscipi, eo spectat ut inde aurum atque argentum excudatur. Est enim peropportuna ad usum communem et civilem vitam pecunia, quam necessario Aristoteles inventam tradit ad commercia hominum resque mutuo contrahendas... Si unusquisque neglexerit operari quicquid excedat usum suum, necesse erit, ut omittam reliqua, nos omnes agrum colere... Videte quantum a vestra opinione dissentiam. Sint aliqui prae ceteris avari, praeter hanc communem avariciam cupidi: vos extimatis e civitatibus hos abici oportere; ego contra advocari in illas, tamquam opportuna adminicula ac sustentacula populorum.... Cum enim affirmas plura mala avariciam peperisse, ego et plura bona.

If all those who want a little more money were to be called greedy, well then, we should consider everyone, or almost everyone guilty of this crime. Everything that people do, they do for money; we are all governed by the desire to earn, and not just a little if possible; and if earnings were to be eliminated, all trade and business would cease. Nobody would undertake anything if there were no hope of turning a profit. Everyone pursues this hope and everyone cultivates it. Consider military activity, trade and agriculture; consider the so-called mercenary trades; consider even those that are said to be liberal professions: and you will see that a great desire for money prevails in all of them. What else indeed (if we do not want to mention the humblest jobs, whose goal is obvious), what else attracts lawyers if not the desire for money, and no small desire at that, and the possibility of more substantial

profits? And what about doctors? And all the other professional people? Look then at the more sacred disciplines, philosophy and theology: in your opinion, do people study them so much out of love for knowledge or for money? Everything that people do, all the risks they undertake are for this purpose: making gold and silver out of it. Money is anything but an evil from the point of view of collective well-being and civic life. Aristotle says this too, that money was a necessary invention for trade. If nobody exerted themselves to earn more than the bare minimum, we would all have to cultivate the fields, not to mention other things... You see how far removed I am from your opinion. If some people are more motivated than others by profit, you would like to drive them out of civilised society; I on the other hand would invite them in, because I believe them to be essential to support the people. And since you say that avarice has given rise to innumerable misfortunes, then I say to you that it is also the fount of many good things.¹⁴

Envy

A similar line of reasoning can be followed for envy. The envy that Dante had in mind is that which leads to suffering over the happiness of others and to desiring the downfall and ruin of the successful¹⁵ (just think of Sapia, who revelled in the defeat of her fellow citizens in Siena).¹⁶ Another kind of envy, which economists do not dislike, is that which drives a person, following the example of others, to procure – through work and resourcefulness – what they are lacking. The benefits of benign envy cannot be too difficult to identify if Hesiod had already observed them in the seventh century BCE. In the preamble to *Works and Days* we find this passage:

οὐκ ἄρα μόνον ἔην Ἐρίδων γένος, ἀλλ' ἐπὶ γαίαν
 εἰσὶ δύω: τὴν μὲν κεν ἐπαινέσσειε νοήσας,
 ἢ δ' ἐπιμωμητῆ: διὰ δ' ἄνδιχα θυμὸν ἔχουσιν.
 ἢ μὲν γὰρ πόλεμόν τε κακὸν καὶ δῆριν ὀφέλλει,
 σχετλίη: οὐτίς τὴν γε φιλεῖ βροτός, ἀλλ' ὑπ' ἀνάγκης
 ἀθανάτων βουλήσιν Ἔριν τιμῶσι βαρεῖαν.
 τὴν δ' ἑτέραν προτέραν μὲν ἐγείνατο Νύξ ἐρεβεννή,
 θῆκε δέ μιν Κρονίδης ὑψίζυγος, αἰθέρι ναίων,
 γαίης ἐν ῥίζησι, καὶ ἀνδράσι πολλὸν ἀμείνω:
 ἦτε καὶ ἀπάλαμόν περ ὁμῶς ἐπὶ ἔργον ἔγειρεν.
 εἰς ἕτερον γὰρ τίς τε ἰδὼν ἔργοιο χατίζει
 πλούσιον, ὃς σπεύδει μὲν ἀρώμεναι ἢ δὲ φυτεύειν
 οἰκόν τ' εὖ θέσθαι: ζηλοῖ δέ τε γείτονα γείτων
 εἰς ἄφενος σπεύδοντ': ἀγαθὴ δ' Ἔρις ἦδε βροτοῖσιν.
 καὶ κεραμεὺς κεραμεῖ κοτέει καὶ τέκτονι τέκτων,
 καὶ πτωχὸς πτωχῷ φθονεῖ καὶ ἀοιδὸς ἀοιδῷ.

So there was not just one birth of Strifes after all, but upon the earth there are two Strifes. One of these a man would praise once he got to know it, but the other

¹⁴ *De avaricia*, in 'Prosatori latini', pp. 260-262, 266, 270, 274.

¹⁵ *Purgatorio*, XVII, 115ss.

¹⁶ *Purgatorio*, XIII, 106ss.

is blameworthy; and they have thoroughly opposed spirits. For the one fosters evil war and conflict – cruel one, no mortal loves that one, but it is by necessity that they honor the oppressive Strife, by the plans of the immortals. But the other one gloomy Night bore first; and Chronus' high-throned son, who dwells in the aether, set it in the roots of the earth, and it is much better for men. It rouses even the helpless man to work. For a man who is not working but who looks at some other man, a rich one who is hastening to plow and plant and set his house in order, he envies him, one neighbor envying his neighbor who is hastening towards wealth: and this Strife is good for mortals. And potter is angry with potter, and builder with builder, and beggar begrudges beggar, and poet poet.¹⁷

Material and spiritual goods

The time has now come to enter Purgatory, because Dante's cantos on envy (XIII, XIV and XV) lend themselves to further, interesting, considerations. The character who introduces us to the theme is Guido Del Duca, a nobleman from Romagna. It is he who utters the famous lines "*le donne e' cavalier, li affanni e li agi*" ("the ladies and the knights, the labors and the leisures"), echoed by Ariosto at the beginning of his epic poem *Orlando Furioso*. Well then, in Canto XIV, Guido declares unequivocally that he has been very envious during his lifetime. Yet how he says it initially defies comprehension. He refers to the human desire for goods for which there is a "*mestier di consorte*¹⁸ *divieto*" ("where sharing must be forbidden"). "Where sharing must be forbidden"? It is not just we twenty-first century Italians that remain nonplussed; the passage must have seemed opaque back then too. Even Dante himself does not seem to apprehend its meaning immediately. So much so that in the next canto, he asks Virgil for an explanation: what is this "sharing" and "forbidden" to which Guido refers? And Virgil explains:

*Perché s'appuntano i vostri disiri
dove per compagnia parte si scema,
invidia move il mantaco a' sospiri.¹⁹*

"Because your desires point to where sharing
lessens each one's portion, envy moves the bellows
to sighing."

The crux is in the words "*dove per compagnia parte si scema*" ("where sharing lessens each one's portion"). They mean this: you sinners, you worldly people, set your hearts on goods which, if divided with others ("*per compagnia*", "[by] sharing"), give lesser enjoyment, because each person's part shall be smaller ("*parte si scema*", "where sharing lessens each one's portion"). There is, then, no possibility of sharing ("*con-sorte*", [common lot]: "*è mestier di consorte divieto*", "where sharing must be forbidden"). Of what goods do we

¹⁷ *Works and Days*, 11-26 (translated by Glenn W. Most, Cambridge, Massachusetts – London, England, Harvard University Press, 2006).

¹⁸ This is the reading given by Petrocchi's critical edition of the *Commedia*, in preference to the traditional (Crusca) "*consorto*", though the latter is corroborated by numerous manuscripts. Be that as it may, the word should not be understood in the modern Italian sense of '*consorte*' ('consort, spouse'), but rather in the abstract one of "*consortium*, sharing".

¹⁹ Lines 49-51.

speak? Of the lion's share of goods that are the subject of economists' analyses, such as houses, cars or chickens: if I share my chicken with you, I will only have half left.

Dante stigmatised, in short, the desire for worldly goods, for all worldly goods.²⁰ Whoever possesses them does not want to share them, because they would obtain a smaller benefit. Spiritual goods are another matter entirely. God's love, as Virgil explains later on in an elegant doctrinal passage that anticipates the terse harmonies of the *Paradiso*, is in no way diminished when shared with others. On the contrary, the more "table companions" there are to enjoy this good, the more enjoyment each of them will derive. Those who desire the love of God simply have to ask for it, and no one will contest them:

*E quanta gente più là sù s'intende,
più v'è da bene amare, e più vi s'ama,
e come specchio l'uno a l'altro rende.*²¹

"And the more people bend toward each other up there, the more there is to love well and the more love there is, and, like a mirror, each reflects it to the other."

Envy has no place here.

Rivalry, exclusion, public goods

Now, some six and a half centuries after Dante wrote these verses, economists (not, I believe, inspired by the poet but one never knows...) began to wonder whether, speaking of economic goods, it is always true that "*per compagnia parte si scema*" (sharing lessens

²⁰ At the end of Canto XIV (148-150):
*Chiamavi 'l cielo e'ntorno vi si gira,
mostrandovi le sue bellezze etterne,
e l'occhio vostro pur a terra mira...*
"The heavens call and wheel about you, showing you their eternal beauties, and your eye still gazes on the earth..."

And afterwards, in Canto IX of the *Paradiso* (10-12):
*"Ahi anime ingannate e fatture empie,
che da sì fatto ben torcete i cuori,
drizzando in vanità le vostre tempie!*
"Ah, deluded souls, wicked creatures who twist your hearts away from such a good, directing your faces toward emptiness!"

Even before this, in Canto XI of the *Purgatorio*, that of the prideful, Oderisi da Gubbio had warned about fame (100-102):

*Non è il mondan romore altro ch'un fiato
di vento, ch'or vien quinci e or vien quindi,
e muta nome perché muta lato.*
"The clamor of the world is nothing but a breath of wind that comes now from here and now from there, and changes names because it changes directions."

Yet on fame, as on many other things, Dante's thoughts were not easily reconcilable (*Inferno* IV, 76-78) XVI (66) XXIV, 46-51; and there may be more passages to consider). That in the *Commedia* one finds everything and the opposite of everything is part of its centuries-long appeal.

²¹ Lines 73-75.

each one's portion). In 1954, Paul Samuelson (who would later win the Nobel Prize for Economics) formalised the concept of rival goods.²² A good is defined as "rivalrous" if its enjoyment by one party is diminished when another party consumes the same good. We are in the classic chicken-sharing situation, and the consideration is precisely that which Dante has Virgil utter. Samuelson, however, unlike Dante, also identified a category of (worldly) goods that are "non-rivalrous". For example, national defence or street lighting. If I benefit from a street lit at night, I do so without preventing my fellow citizens from enjoying the same good. These are non-rivalrous economic, worldly goods.

If the two could meet, Samuelson would tell Dante that there are not only spiritual goods outside the sphere of envy. On the other hand, it is interesting how Dante, in warning his contemporaries against this capital sin, highlighted a characteristic of worldly goods, or rather of many of them, which is their rivalrous nature – something which would only be formalized many centuries later by economists. Although commentators have identified the probable origin of Dante's thinking (Saint Augustine plays on the same theme in *The City of God*),²³ nobody, that I know of, has emphasised the link between the moral foundation of Cantos XIV-XV and economic analysis.

In 1959, Richard Musgrave described another category, non-excludable goods, which partly overlaps with the previous one of non-rivalrous goods.²⁴ To obtain a loaf of bread from the baker, the customer must pay up, because otherwise the baker keeps it: he or she can "exclude" the customer's enjoyment of it. But there is no way of excluding the passer-by from the benefit of public street lighting. In this second case, those who produce the good are unable to recoup the costs and realise a profit by imposing a price for its use. If a good is non-rivalrous in the way intended by Samuelson and non-excludable à la Musgrave, it is what is called a "public good".

It is clear why Dante is interested in these matters: from rivalry and excludability comes envy, a capital sin.

But what about the economists? I think it is intuitive (there are, of course, formal ways to demonstrate it in the abstract world of economic theory) that to produce a "public good" relying solely on market forces, in other words on individual trades between producers

²² Paul A. Samuelson, "The Pure Theory of Public Expenditure", *Review of Economics and Statistics*, 36(4): 387-389 (1954).

²³ As is well known, Saint Augustine contrasts two cities, we would say two communities. The city of men seeks worldly satisfactions, while the city of God aspires to higher things. Within this broad vision, the author compares Cain and Abel to Romulus and Remus. The latter were both anxious to claim the glory of the foundation of Rome. "*Ambo gloriam de Romanae rei publicae institutione quaerebant; sed ambo eam tantam, quantam si unus esset, habere non poterant. Qui enim uolebat dominando gloriari, minus utique dominaretur, si eius potestas uiuo consorte minueretur. Vt ergo totam dominationem haberet unus, ablatum est socius, et scelere creuit in peius, quod innocentia minus esset et melius*", *De Civitate Dei*, XV, 5 ("Both desired to have the glory of founding the Roman republic, but both could not have as much glory as if one only claimed it; for he who wished to have the glory of ruling would certainly rule less if his power were shared by a living consort. In order, therefore, that the whole glory might be enjoyed by one, his consort was removed; and by this crime the empire was made larger indeed, but inferior, while otherwise it would have been less, but better"; Saint Augustine, *The City of God*, translated by Marcus Dods, New York, Random House, 1950).

²⁴ Richard Musgrave, *A Theory of Public Finance*, New York, McGraw-Hill, 1959.

and users, is problematic. Adam Smith's idea, which is applicable to all the other goods, does not hold here. Somehow, the community of users, the State, must intervene.

Thinking about non-rivalrous and non-excludable goods takes us a long way. If you allow me, we shall now make a small digression toward the attendant consequences, which as we shall see matter greatly. Even if the path leads us away from Dante for a while, and closer to the issues of today.

Up to now, I have spoken about national defence and public lighting, classic examples from the 1950s, but the question of the public nature of goods does not end there. If you look at the Wikipedia entry for this in English, you will find listed, among other things, the production of knowledge and of official statistics, flood control systems, and lighthouses (yes, lighthouses that signal to ships the position of certain points on the coastline; as to why Wikipedia mentions them, we shall see that shortly).

One of the greatest challenges of our century is the preservation of the environment, and specifically the prevention of global warming. Strictly speaking, in this case we are talking about "common" rather than "public" goods and the question is slightly different too, not so much about how market incentives do not lead to their production in sufficient quantities but rather that they do not impede their excessive exploitation. (The good that is not produced in sufficient quantity is, if you like, the absence or reduction of pollution). There is no need to enter into the details. Let's just say that, in general, this is about goods or other utilities whose utilisation rights cannot be easily exchanged on the market because, in one way or another, there is no "ban on sharing": all of humanity benefits or would benefit from a reduction in greenhouse gas emissions; however, given the difficulty of exchanging them at individual level, for similar goods the customary theoretical presumption that the market alone can ensure their efficient allocation falters.

How to supply public goods

Well then? There are various solutions, none of them perfect; one does not always exclude the other. Over the course of this brief conversation, I will just hint at them briefly.

The first solution is simply that the government must take responsibility for the public good. This is frequently adopted: the town council looks after street lights and the State looks after national defence. One variant is that the public authorities purchase the good or service from the private sector rather than producing it directly; this often delivers better operational efficiency. (This variant does not seem advisable for defence). The fact remains that the how and how much of a service, together with the distribution of the burden of the cost among the citizenry, depend on the authorities' decisions, in which citizens only have an indirect say when there are elections (as long as they live in a democratic regime). Furthermore, in the absence of a world super-state, this solution is not easily applied to global public or common goods.

The second solution is imposing taxes or granting subsidies that simulate the damage or benefit for citizens ensuing from the non-rivalrous or non-excludable consequences of private business, such as pollution or research. This solution provides the market with theoretically

correct incentives (even if the tax or subsidy is only an approximation, not always easy to compute, of the effect of the activity in question on well-being), and then lets it produce the good in the most efficient way. The carbon pricing that is under discussion nowadays falls into this category. Problems arise here too in the case of a global common good, since not all countries are willing to introduce the same measures (taxes, for example).

The third solution is to establish rules, such as on anti-emissions standards. This is clearly a direct and potentially effective approach, but the inevitable inflexibility of laws may create inefficiency. For example, imposing the same obligations to reduce emissions on all firms is equivalent to a poor allocation of resources if this reduction is far costlier for one firm than for another.

It follows that the rigidity of the rules is sometimes tempered by market mechanisms, for instance through the concept of freely tradable "emission permits". The State decides the total amount of emissions tolerated and provides for an initial distribution of the relative quotas; private firms can then trade them against payment. Those who are able to reduce emissions at low cost will take advantage of the chance to sell their shares to firms for which a reduction is more expensive. The overall reduction will not change, but the cost of achieving it will fall.

This shows that the fourth solution, i.e. relying to a certain extent on the market, is not actually entirely excluded, even in the case of public goods. Ronald Coase, another Nobel prize winner for Economics, went so far as to argue that, in the absence of transaction costs and provided that property rights are clearly defined, there is no good to which the market cannot assign an efficient price. His paper on lighthouses is famous (that is why Wikipedia mentions them), in which he tries to demonstrate that for a certain period in England, the coastal lighthouse service, apparently the most public of public goods, was actually supplied by private companies for profit. It should be pointed out that the details of this story are not uncontroversial. Above all, however, the absence of transaction costs required for the validity of Coase's "theorem" is a very demanding condition. Put simply, it assumes that it is possible to stipulate a private agreement instantly and at no cost, according to which all the stakeholders (potentially millions or billions of people) voluntarily "buy" (for example) the polluter's renunciation of the right to pollute.

Difficult? Impossible? In a literal sense, yes, of course. Let us consider, though, another element of the ongoing debate on global warming. As we know, the emerging countries complain because the advanced countries want to impose strict limits on their emissions, having themselves pumped countless megatonnes of CO₂ into the atmosphere from the beginning of the industrial revolution until today.²⁵ The emerging economies say that they are only willing to adopt certain standards in exchange for cash transfers from the rich countries that are insisting on imposing them. In fact, the Paris Agreements already included this sort of idea and the most recent negotiations have further advanced the debate. Think about it: if we look closely, this is basically the application of a version of Coase's theory, in which a few dozen governments try to negotiate on behalf of billions of people.

²⁵ Anyone interested in a simple quantitative summary in graphic form can consult Hannah Ritchie, for example, "Who has contributed most to global CO₂ emissions?", ourworldindata.org (2019).

Will it work? Let us hope so, even though we still do not know. One way or another, in order to find a global solution for the problem of greenhouse gas emissions, especially given a world order based on independent and sovereign jurisdictions, a combination of various tools will be needed: public investments, rules, incentives, and market solutions.

* * *

If I had told you that I was going to talk about Dante and global warming, you would definitely have thought of the blazing flames of the *Inferno*.

Not so. If you look, you can find everything, or nearly everything in Dante; if I have convinced you, there is even a foretaste of the twentieth-century economic theory on non-rivalrous goods. Starting from the intellectual world of the *Commedia*, we have taken a perhaps unexpected path, which has led us from the capital sins punished in *Inferno* or expiated in *Purgatorio* to some of the most important and less intuitive topics of economic theory, and lastly to the debate on the most passionately felt global issue of our time.

I will conclude with two thoughts.

The first is that global common goods require some form of global governance, and Dante would have agreed with this unhesitatingly. His political view was based on a universal empire that was supposed to ensure peace and good governance for humanity (even though the horse he had backed, Henry VII of Luxembourg, failed to cross the finish line, to his great disappointment). Dante was certainly fooling himself in thinking that the solution consisted in attributing supreme authority to just one man.²⁶ Just as he did not understand the power of the market, neither did he take democracy into consideration,²⁷ and the two do have something in common (doing without a single, all-powerful decision maker, the idea of the "wisdom of the crowd" (as we might call it today) and peaceful mechanisms for correcting errors). In fact, Aristotle, the revered "master of those who know",²⁸ would have been able to teach him something about it. (On the political front,

²⁶ Although he tried to justify it by showing, as the economist would say, that incentives are correct: the universal monarch, with nothing left to desire on earth beyond what he already has, namely, supreme power, can certainly devote himself to justice (*Monarchia*, I, XI; *Convivio*, IV). Seen through modern eyes, this argument can only leave us somewhat sceptical.

²⁷ Like the market, democracy can only prosper in a framework of rules that are sufficiently certain, protective and observed. Whatever incipient popular government Dante saw around him seemed to be a harbinger of unrest and bloody factional battles, or at best, of unwarranted, even laughable ambitions ("I mi sobbarcol", "I'll take it on") and of a pathologically unstable legislative framework ("a mezzo novembre non giunge ciò che tu d'ottobre fili", "what you spin in October does not reach to mid-November": *Purgatorio*, VI, 135; 143-144). This was clearly not just an abstract idea: the violence of the clashes between factions left a profound mark on his life, as he was exiled, theoretically sentenced to death and his goods were confiscated when his political faction fell from power. This dense fog of public ills and personal suffering prevented him from seeing further ahead. After all, nobody can judge Dante while taking for granted the constitutional guarantees typical of a modern liberal democracy.

²⁸ *Inferno*, IV, 131.

however, Dante had another intuition that was ahead of its time, namely the advantages of the division of powers,²⁹ but that is a conversation for another day).

I do not know whether we should hope for a universal empire to be established one day; we can certainly hope that common solutions to common problems are found in time and in good faith.

The second thought is that, when we think about bigger problems, it helps to rely on broader visions. No one viewpoint allows us to see the full picture; no single discipline has the final say. So, as has happened this evening, it is a good thing for economists not to lose sight of literature and for literary scholars not to lose sight of economics.

²⁹ Purgatorio, XVI, 106-108, where Marco Lombardo condemns the end of the separation between spiritual and temporal power, with arguments that would be called "checks and balances" in modern parlance. The topic of the relationship between the two powers is broadly covered in the third book of *Monarchia*. Dante was certainly not the first to discuss it; this intellectual dispute had provided theoretical weapons for the struggle between papacy and empire for at least two centuries; he did, however, put forward some original arguments (A. Sparano, *Dall'ἀγαθόν alla vita sufficiens*, Rome, Aracne, 2017, Ch. 3.2).

