"The Birth of Price Theory in Peter Olivi's Treatise on Contracts (Narbonne: 1295): A Tool against Misconceived Regulation"

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Abstract: Confession was made compulsory in 1215 at the Lateran Council. Confessors became a kind of regulators, providing advice and inflicting fines, called "restitutions". Peter Olivi created price theory in 1295 to show that their concepts of 'just price' and 'usury' were misconceived and harmful for the 'common good'. The paper uses Olivi's own words, duly translated into English, to bring out his path-breaking contributions using the tools of elementary microeconomics to take stock of his achievements. His theoretical framework is presented step-by-step, culminating with capital-asset pricing and long-distance trade. The paper then briefly highlights the salient thinkers that kept his legacy alive across about three centuries.

1. Introduction

Confession was made compulsory for all Christians by the Lateran Council of 1215, at least once a year[1]. Over time, confessors became some kind of regulators, providing a lot of advice, and inflicting fines to the "sinners", called "restitutions". Merchants and traders became over time their main targets, while restitutions' money was becoming a sizable source of income for bishoprics and monasteries (Piron, 1999). Erroneous concepts of "the just price" and of "usury" were applied out of purpose in good faith by many confessors, while others were cautiously suspected of abusing the system. Several friars and laypeople, and even 'troubadours', started to write books, pamphlets, and even poetry, questioning this practice and its doctrinal foundations. Among them, Peter Olivi[2] wrote the most ambitious theoretical analysis aimed at providing a consistent framework to discuss the pros and cons of free markets and contracts in his *Treatise on Contracts*, completed in Narbonne in 1295 at the ephemeral *studium* attached to the Franciscan convent (Caille, 1970). He was born in 1248 in Sérignan, between Beziers and the Mediterranean Sea, and he joined the Franciscan order at the age of 12. He studied in Paris, in the late 1260s and then started teaching at Montpellier in 1272 or 1273. He was censored by his hierarchy in 1283, after a critical examination of his work by a committee of Parisian scholars, and rehabilitated shortly after. He then moved to Florence in 1287-89, to the *studium* attached to the *Santa Croce* church, before returning to Montpellier and lastly to Narbonne, where he died aged 50.

The present paper offers first a rational-choice hermeneutic of this book that brings out the incredible modernity of his arguments using the tools of standard basic microeconomic theory and a pinch of game theory. Despite the fact that he ended up being excommunicated *post mortem*, his grave desecrated, and his books sentenced to be burned, Olivi left a powerful legacy thanks to some followers who took the risk of disobeying the order and circulating the book undercover or even organizing publicly voiced reading groups to instruct illiterate ones

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[1] Piron (1999) provides a very rich narrative of the relationships between confessors and merchants at the end of the 13th and beginning of the 14th centuries and their impact on Olivi's book.

[2] Peter Olivi is his generally accepted name in the English language literature. We only know for sure his Latin name: *Petrus Johannis Olivi*. His Occitan name probably was *Peire Johannis Olivi*, as Johannis was a common name in the area at that time, meaning 'of John' in Latin. For example, there was a Berenger Johannis, lawyer and cannon of the St. Etienne church in Narbonne in 1340 (Caille, 2005). Then, 'Olivi' meant that he belonged to the branch from Olieu, near Montpellier, of the Johannis family. Therefore, a more accurate translation of his name into English could be: Peter Johnson Olivian, but it would probably puzzle many readers.

(Burr, 2001). Olivi's microeconomic theoretical framework is presented first, starting with an analysis of the bilateral purchase and sale between two agents. It shows first how some basic principles of justice and equity could be used to determine the equilibrium price agreed upon for such a transaction, based on inter-personal utility comparisons. However, Olivi suggests that some of the required information for that is very unlikely to be available to ordinary individual buyers and sellers, thus precluding the widespread use of this transaction method in the real world. However, he comes back to it in his final discussion of long-distance trade that synthesizes his theoretical contribution. He then describes how the community can collectively find the just price, at least approximately, thus providing the required information for guiding individuals in finding the right prices for their transactions, even for long-distance trade. The models used here provide for the first time a fully consistent and theoretically sound presentation of "Olivian Economics". The paper then sketches the prosopography of the chain of people who took the risk of reading, reproducing and distributing the forbidden book and spreading its conceptual framework across several centuries. The paper concludes by emphasizing how good basic price theory can be used as a tool for shrugging off overly restrictive institutional shackles.

2. Microeconomic Foundations: 2x2, Money and Goods Exchange

To build his theory on solid foundations, Olivi first focuses on the sale and purchase of a good for money between a seller and a buyer. The basic motivations of the agents are clearly stated as follows: "[…] "almost all [community members] want to sell dear and buy cheap[3]." (p.95). In other words, postponing some refinements to later analysis, Olivi seems to assume that the seller wants to maximize revenue while the buyer wants to minimize outlay. They have to agree on a price within a given set which is bounded from below by the fact that "[…] "no legal rule forces me to give away or exchange my good, except at a price that I approve and I have chosen […]." (p.95). This is basically defining the seller's minimum selling price, which we call reservation price in modern economics. This price range is bounded from above by the fact that "If the purchase and sale contract is purely voluntary, […] 'the thing is worth as much as it can be sold for'." (p.97). This is defining the buyer's "demand price" as her maximum buying price, or willingness to pay in modern language. Combining these two constraints clearly defines the "bargaining set", where a deal can be

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[3] All the translations of Olivi's quotes from French into English are mine.

made. Then, Olivi assumes that this set is not empty as "[…] the exchange contract is initiated and ratified by the free and complete agreement of the two parties, so that the buyer wants the thing more than its price, and the seller the opposite." (p.131). If both relations hold, then the two agents will benefit from positive gains from trading, may be not strictly so for both in case of a corner solution. However, this leaves open the question of how the two participants will eventually agree on a given price. Olivi first discusses this issue within the 2x2 setting, before enlarging it to the level of the whole community, to bring out the latter's contribution and potential pressures that help the agents to find a suitable price.

Olivi first examines how standard ideas of justice and equity could help us predict which price the two agents could agree upon, before showing the limits of this approach. His basic requirement is that we must work in the utility space rather than in terms of monetary evaluation: "[…] justice in exchange does not consist of a real equivalence of things, measured according to the absolute value of their natures, but only of an equivalence related to our use and our utility […]." (p.109). In that space, then: "[…] equity in commutative justice requires that I confer to you as much utility as you confer to me" (p. 109)[4]. This implicitly assumes that inter-personal comparisons of utility are legitimate, an assumption that he nuances later. Comparing figures 1 and 2 below clarifies the importance of this assumption relative to a pure pecuniary interpretation of their objective functions that could be hastily derived from the claim made above that the players want either to maximize their revenue or minimize their outlay, respectively. Let us define p^H as the maximum price that the buyer is prepared to pay to buy the good and p^L as the minimum price that the seller requires to sell it, and let $p* \in \left[p^L, p^H \right]$ denote the equilibrium price at which the transaction is made. Define $\Delta_B = p^H - p*$ and $\Delta_S = p* - p^L$ as the buyer's and the seller's pecuniary gains from trade, respectively, assuming for simplicity that only one unit of the good, appropriately defined, is changing hands. A pure pecuniary definition of equity in commutative justice would then require: $\Delta_B = \Delta_S$, which entails:

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[4] It turns out that Turgot's (1769) analysis of price determination is so close to Olivi's (1295), even as translated from Latin into French by Sylvain Piron in 2012, that the following modelling exercise is directly inspired by the one that Desai (1987) devotes to Turgot's, while significantly different in specification. Although Turgot may not be accused of plagiarism, his contribution seems to consist of some clarification and minor extensions of Olivi's analysis, as some sentences are nearly the same in both texts. For example, both Olivi and Turgot call the equilibrium price an "estimation", with different adjective attached, "average estimative value" for Turgot, "common estimate" for Olivi.

$$p^H - p^* = p^* - p^L \Leftrightarrow p^* = \frac{p^H + p^L}{2}. \tag{1}$$

Figure 1 depicts equation (1), showing that equality of the pecuniary gains from trade of the two players entails a split of the $\left[p^H, p^L \right]$ price range into two equal shares. Notice as well that this equal-gains equilibrium has the Paretian property that any deviation of the actual price from p^* would benefit one player to the detriment of the other. For instance, choosing a price above p^* would increase Δ_S and reduce Δ_S by the same amount. Symmetrically, cutting p^* by the same amount would have exactly the same effect in reverse. Olivi wouldn't approve of such moves in either direction by reference to the golden rule: "[…] rectitude of the divine law, charity and natural right impose that we shouldn't do to anybody what, by a natural and righteous bent, we would not want to be done to us". (p.97). However, complying with Olivi's requirement to define justice in exchange in terms of utility rather than in pure pecuniary terms quoted above leads us to nuance this conclusion.
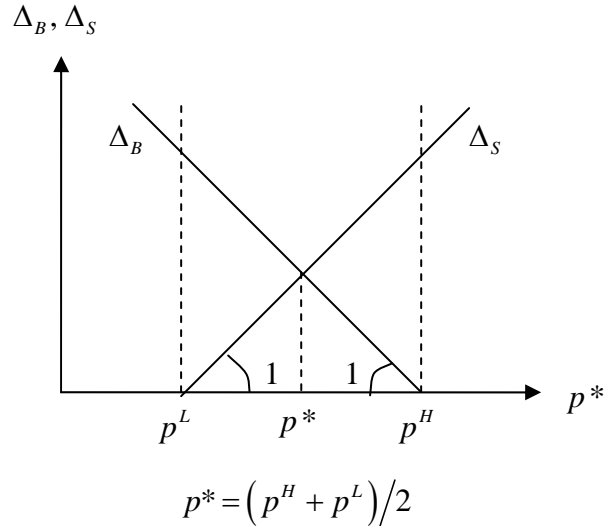
Figure 1: Pecuniary Equitable Equilibrium Price

In the utility space, assume instead that each agent's utility function is increasing and concave in the pecuniary gain made in this transaction, and independent of it when the transaction does not occur. The following specification, where U_B^L and U_S^L are exogenous parameters, captures these properties, in obvious notation:

$$U_B = U_B \left(p^H - p* \right) = U_B^L + v_B \left(p^H - p* \right) \text{ st } v_B(.) = 0 \text{ if } p* \geq p^H, \qquad (2)$$

and

$$U_S = U_S \left(p* - p^L \right) = U_S^L + v_S \left(p* - p^L \right), \text{s.t. } v_S(.) = 0 \text{ if } p* \leq p^L. \qquad (3)$$

This specification still captures the claim made earlier that the seller wants to "sell dear" and the buyer to "buy cheap", as quoted above, but with decreasing marginal utility now. The latter might reflect some incremental bargaining costs, as it takes more and more effort to convince the other side to accept an additional painful price change, up or down depending on the part played in the contract. The parameters U_B^L and U_S^L capture the base-line utility level that each agent gets in case this transaction fails, i.e., the utility derived by all their other activities, which are not affected by this transaction[5]. The assumed slopes and concavity entail that:

$$\frac{\partial U_B}{\partial p*} = -v_B{}'(.) < 0 \text{ and } \frac{\partial^2 U_B}{\partial p*^2} = v_B{}''(.) < 0, \qquad (4)$$

and

$$\frac{\partial U_S}{\partial p*} = v_S{}'(.) > 0 \text{ and } \frac{\partial^2 U_S}{\partial p*^2} = v_S{}''(.) < 0. \qquad (5)$$

Let us bring out the implications of this move to the utility space in two steps, depending on how Olivi's "I confer to you as much utility as you confer to me" requirement mentioned above is interpreted. It might either be interpreted as requiring that both agents must end up with the same level of utility after the deal is made, or as expressing the milder requirement that it is just the incremental utility gain resulting from the bargain that matters. The former seems the natural interpretation, as "to confer" is not generally understood as a move from a given initial point, but in absolute terms like in "conferring a power". However, it can be shown that it is not what Olivi has in mind. The following modeling exercise clarifies this point.

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[5] This involves a strong separability condition, commonly assumed in the literature for the sake of simplicity, because the sign of the implicit cross-second derivative is otherwise unknown.
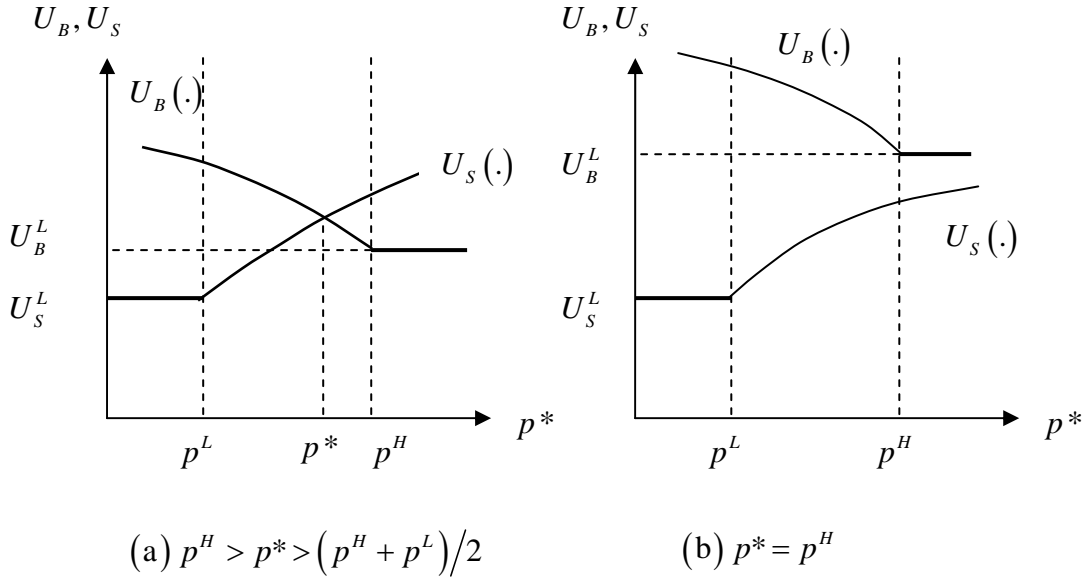
Figure 2: Equal-Utility Equilibrium Price and Corner Solution.

Figure 2 shows in case (a) that equality of utilities in the equitable equilibrium may yield a determinate equilibrium price, which does not necessarily result in equal gains in pecuniary terms as in (1). In case (b), the buyer and the seller fail to strike an equal-utility deal as the buyer pays her maximum acceptable buying price, thus reaching her lowest level of utility, which is higher than the seller's highest possible one in this transaction. Notice that the Paretian property introduced above also holds in these two cases, in utility terms this time. Other cases can be created likewise, *mutatis mutandis*. These two cases only differ by the change in the value of the parameter U_B^L that measures how well off is the buyer if she does not get the good. If we interpret this as a sign of affluence comparable to the seller's U_S^L, we see that figure 2 predicts that the latter will charitably charge a lower price to the less well-off buyer in this setting, a fairly natural implication of the equal-utility requirement. This is not absolutely ruled out by Olivi who states that: "[…] like one could have given it all without requiring any price, one could as well sell or give one's good for half its price" (p.131). This redistributive dimension holds even if we compare two interior equilibria, as can be checked by shifting $U_B(.)$ a bit downwards in the left-hand panel of figure 2. Thus, in figure 2 case (a), "I confer to you as much utility as you confer to me" is understood as resulting in the final equilibrium contract yielding equal utility levels. Then, both cases in figure 2 show that this

interpretation might entail some form of charitable redistribution, which somehow compensates a bit for the initial inequality of affluence.
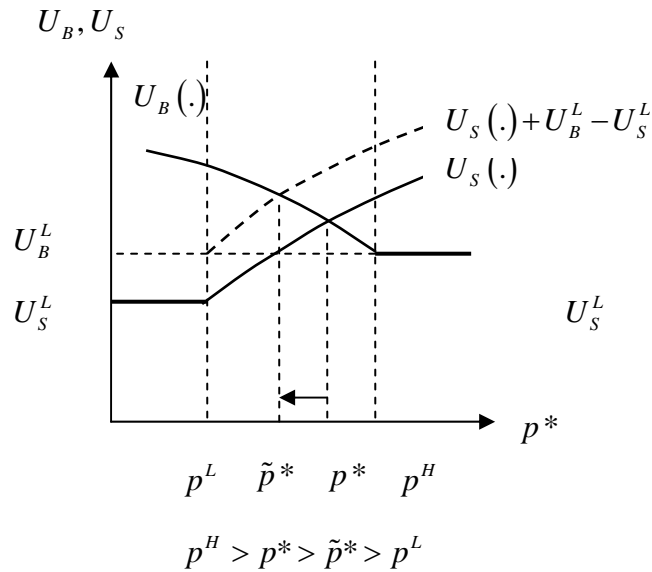
Figure 3: Equal Incremental-Utility Equilibrium

However, Olivi clearly regards the second interpretation of "I confer to you as much utility as you confer to me", dealing with incremental utility levels only, as a more accurate description of the real world, where charity and business are not usually mixed. In a different context, he provides an additional requirement that undermines the validity of the former one because "[…] it is suitable for the honor and the utility of the political community that the eminent persons be maintained, with pomp and reverence, in some visible superiority and dignity" (p.117). In that case, in order to rule out such a redistributive dimension of a simple purchase and sale contract, the inter-personal equalization of utility should be restricted to the incremental utility pair $\{U_B(.)-U_B^L, U_S(.)-U_S^L\}$ produced by the contract. The equal incremental utility requirement then implies $U_B(.)-U_B^L = U_S(.)-U_S^L$. Figure 3 shows how the same diagram can be amended to correct the utility comparison for the difference in initial affluence captured by the gap between the base-line utility levels $U_B^L - U_S^L$. Graphically, this is achieved by shifting the U_S^L curve upwards, to the dashed-line position labeled $U_S(.)+U_B^L - U_S^L$. Then, the equilibrium price goes down to $\tilde{p}^* < p^*$, thus lowering the assumed less affluent seller's final utility level and increasing that of the more affluent buyer

compared to the equal-utility equilibrium depicted at figure 2. Notice that in this case, the type of corner solution brought out in figure 2 (b) does not exist, as $\tilde{p}^*$ does not depend on the base-line utility levels U_B^L or U_S^L.

However, Olivi acknowledges how difficult it is for the two agents to settle on a proper valuation of the good to be traded: "[…] the suitable price of things for sale is not fixed at a determinate point […] but must be established by the common agreement of the two parties, namely those who sell and who buy", […] "because the absolute and determined value of the goods almost never appears to anybody in a certain and obvious fashion" (p.97). Hence, like modern microeconomics usually does, Olivi finds that performing inter-personal comparison of utility strains credulity. It is first difficult for the seller to guess the buyer's willingness to pay, because of the diversity of tastes among the potential buyers: "[…] somebody may highly value a thing that another one will despise, and estimate it dear and precious, and inversely." (p.103). Comparing cases (a) and (b) in figure 2 illustrates how a simple mistake by one player regarding the other's utility function could have powerful consequences for the final outcome. This comparison shows that two different values of parameter U_B^L of the buyer's utility function may result in significantly different equilibrium prices and even the loss of the equal-utility property in the extreme case. A similar outcome could not result in figure 3, where an increase in U_B^L would not shift $\tilde{p}^*$, as could be predicted from the fact that the bargaining between the two players only determines their incremental utility gains. The agreed price would only change if the slope of one of the player's utility function changed. For example, a clockwise rotation of $U_B(.)$ would entail an increase in $\tilde{p}^*$. This pins down the source of the challenge to the assumption of inter-personal comparison of utility. Moreover, both agents may be affected by legitimate doubt: "[…] we can seldom, or maybe never, perform such a valuation of useful things, except as a conjectural or probable opinion; […] it thus involves different degrees, little certainty and many ambiguities, as expected from opinion-based knowledge, although sometimes more, and sometimes less." (p.103). Olivi raises also the issue of potential hidden drawbacks of the good offered: "the buyer is supposed to be sufficiently industrious at the purchase time, and if the good offered for sale is shown to her[6] so that she can examine it as she pleases, then the seller

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[6] Olivi's book is obviously medievaly male gendered, but I approve the current practice of using feminine as the neutral default gender.

is not obliged to disclose these drawbacks" (p.127). This uncertainty and information deficit plaguing the bilateral quest for the just price provide the main argument used by Olivi to enlarge the scope of his analysis of price formation to the community as a whole: "[…] as the prices of goods and services must be fixed as a function of the order of the common good, one must for this reason look first and foremost at the common appreciation and at the estimation made collectively by the civilian communities" (p.111). In a kind of proto-Austrian way, he ends up praising the free market for providing this information service to buyers and sellers.

3. Common Estimation of Prices

Olivi emphasizes mainly three mechanisms whereby people would basically adopt the common estimate of the prices, and thus contribute to generate the latter in the first place. First, and he pays mainly lip service to it, there is a legal framework that people must comply with, and in particular a kind of proportional price ceiling above which a selling price would be regarded as unacceptable by the civil authorities: "[…] Civil Law states that, if the buyer or the seller has been wronged by more than half the just price, the contract is nil and must be quashed by the judge" (p.103). He then comments: "[…] This is valid only if the wronged party ignores such an excess; because if he consents knowingly to such a price and contract, he is affected by no fraud." (p.105). Above this 50% ceiling rule, the fraudulent price is often referred to as *laesio enormis*, but Olivi seems to regard it as generally irrelevant, being largely above the kind of fluctuations that could be observed in real markets. He relies a lot more on some form of simple social pressure to enforce the common price estimation: "Individual people […] must follow the pattern and the common rule of estimation and valuations, so that no party disagrees with his own group in a shameful, irregular and disorderly fashion […]" (p.117). In other words, people care for their reputation within their group, which could be tarnished if their pricing behavior was regarded as eccentric or outlandish[7]. Lastly, Olivi is even more confident in the institutional solution of auction sale: "[…] if, during an auction sale with publicly voiced bids it was said: 'this is the price', […] this has the virtue of a common estimation of the things for sale, and no fraud could result here from participants' ignorance, as could happen with secret contracts." (p.125). This strong endorsement by Olivi of this auction mechanism is mainly based on the virtue of common knowledge, which is a

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[7] In this respect, Olivi is thus anticipating Greif (2006) who emphasizes reputational effects in transactions in medieval economies, with especially rich case studies of Genoan and Maghribi traders.

central ingredient in the theory of the core as used by Desai (1987) about Turgot's theoretical framework, which looks at times like an enriched version of Olivi's.

Then, Olivi sketches some of the most salient properties of this commonly estimated price, mainly emphasizing the role of supply and demand: "[…] the common estimation of prices takes into account the general succession of states of profusion and shortage or of scarcity and abundance" (p.113). The common demand price curve is downward sloping: "[…] the same wheat is worth more in times of common dearth and famine or shortage than in times when it is abundant to all" (p.101). The recurrent expression of "common dearth" (*communis caristie*) used by Olivi captures in fact the modern notion of excess demand that would justify a price increase: "[…] the common dearth of a certain good entails its common dearness. […] if it wasn't licit to increase this price, it would be to the detriment of the common good, because the owners of these goods would not sell them so easily and generally to those who miss them and need them […]" (p.121)[8]. Notice the difference between "common dearness" and "price". The former is clearly subjective and probably corresponds to a high value of our p^H, while the latter is the actual price, best captured by our p^L, which needs to be increased, as stated above, to induce supply to increase. If the marginal seller raises her selling price, this sends a signal to other sellers having a reservation price slightly above the initial p_0^L that they may now enter the market and sell at a slightly higher price. The price increases resulting from the common dearth are thus serving the common good because the supply-price curve is upward sloping, in modern parlance, so that the price increase reduces scarcity for those who need the goods the most. Figure 4 illustrates this mechanism. The downward-sloping curve labeled p^H ranks the potential buyers by decreasing order of their maximum willingness to pay. The upward-sloping curve labeled p^L ranks the potential sellers by increasing order of their minimum selling price. Each agent is assumed so small relative to the whole community that the lines can be drawn as continuous. Both curves are drawn as continuous straight lines for the sake of simplicity.

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[8] This quote suggests that Olivi focuses on the extensive margin, as traders are supposed to take the binary decision of selling or not. Other passages in the book suggests that this is the correct interpretation, as producers are not supposed to come to the market and traders have a given quantity of a not too quickly perishable good.
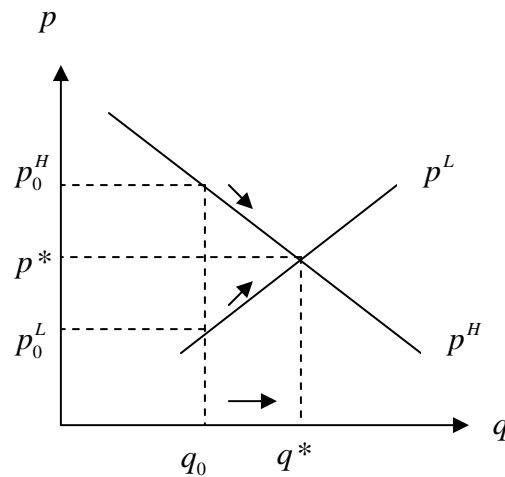
Figure 4: Ending Common Dearth by Supply-Price Increase

Let us start with an assumed supply price p_0^L that just provides the incentive to sell the quantity q_0, assuming for simplicity that all the sellers with a reservation price below p_0^L, located to the left-hand side of q_0 are in fact prepared to sell. All the other potential sellers standing next in line to the right in figure 4 have a higher reservation price than that. Olivi then uses a sophisticated argument to justify the price increase. Competition between buyers will entail that only those who are prepared to pay a price $p^H \geq p_0^H$ will get the good, as the lucky initial buyers who initially paid p_0^L to the initial seller will have an incentive to resell it to those buyers who can afford to bid up the price above that initial price, and so on in a buy-and-sell chain, while avoiding to create a *laesio enormis* at each step. Then, the other buyers will be priced out of the market. Olivi is aware that these 'arbitrageurs', in modern parlance, haven't got a very good popular support: "[…] all the main action and intent of the lucrative office of trade aims at an iniquity or inequality, namely to buy the goods at a low price […] to sell them dear" (p.135). He then engages in a lengthy apology of these merchants, emphasizing in particular their informational role: "[…] if they were not industrious in the subtle estimation of the goods' values, of their prices and their usefulness, they wouldn't be up to their office. […] if they weren't honorable and credible, they would not inspire confidence to the people of the different regions, as required by this office. And if they were not liquid, they could not provide the other regions with the large and expensive goods that they need. One may obviously conclude that they may and must earn […] an appropriate profit. Moreover, it follows that they may and must raise the price of their merchandise up to

a reasonable measure" (p.141). To conclude: "[…] after the craftsmen and the peasants have obtained a suitable gain from the sale of their products, the merchants may extract a suitable gain, because of the advantage that they provide to others" (p.141)[9]. Learning about such a chain of unobtrusive purchases and sales performed by those I called the "arbitrageurs", the original sellers and the next in line along the supply curve will have an incentive to increase their own selling prices first, at or above their reservation price and thus start selling in a peddling way. This kind of predictable response by the sellers fits well with Olivi's emphasis on the merchants' informational role mentioned above. The sellers in the relevant range will increase their price, provided they are free to do so, and not threatened to be sentenced to pay some "restitutions" by their confessors. Otherwise, the not-so popular "arbitrageurs" described above will proliferate to imperfectly compensate for the resulting price rigidity. The little arrow borne by the upward-sloping p^L curve shows the impact of increasing the supply price from its initial disequilibrium level p_0^L to the "common estimate" $p*$, i.e., the equilibrium price that exhausts the arbitrage opportunity. Eventually, the latter will be reached, and the dearth ended. The little arrow borne by the demand price shows how the reduced scarcity allows potential buyers who were initially priced out of the market to get back in. This is literally achieved by converging to a "common estimate", in Olivian language, where the marginal purchase and sale contract, denoted here $\left\{ p_{max}^L, p_{min}^H \right\}$, leaves zero pecuniary gain from trading for the marginal buyer and seller, as $p_{min}^H = p_{max}^L = p*$. All the other active buyers and sellers enjoy a strictly positive gain from trade, what Marshall would label consumer's and producer's surpluses six centuries later. Notice that Olivi is a bit too emphatic when he writes that the reduced scarcity benefits "those who need the goods the most", as this door is only open to those who can afford to pay $p^H \geq p*$. Nevertheless, Olivi's point is made successfully that preventing price increases when a common dearth prevails, e.g., by enforcing price rigidity by the threat of inflicting "restitutions" to merchants confessing that they increased theirs, as many confessors seem to have commonly done as far as Olivi knew, was a counter-productive move in terms of the common good. Moreover, Olivi understands that these market-price fluctuations are working not only in the goods markets, but in the market for labor, or "industry" in his own words, as well: "[…] where gold or wheat

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[9] This friendly description of the merchants and traders by Olivi is also pointed out by Baeck (1994), a Flemish Belgian from Leuven who also seems to take side with them as he writes: "The highly cultivated Languedocian business community, enjoying a *fin amor* tradition of lay prose and poetry voiced by wandering minstrels and troubadours, stood in stark contrast with the less advanced *marchanderie* of northern France, Paris included" (p.167).

are commonly in great abundance, they are not valued at as high a price as where they are commonly in great shortage[10]. The same holds true when there is a glut of doctors or lawyers, unskilled labor or road workers" (p.113).

Then, Olivi cites some other shift factors that help the reader to perform some "comparative-statics" predictions. Some of them affect the buyer's side, thus shifting the p^H curve: "[…] some things are, by nature, more quickly corruptible, or little or hardly pliable, while others are more durable and more ductile" (p.113), thus shifting the p^H curve upwards in the latter's market compared to the former's one. Similarly: […] some are naturally more beautiful than others […] the common estimation of prices make these ones prevail over the others" (p.113). Some other shift factors affect the seller's side, thus shifting the p^L curve: "[…] we pay a higher price, *ceteris paribus*, for goods or services that are produced or delivered by means of higher labors and risks." (p.115). "Regarding the products that require more skills, they are estimated at a higher price, *ceteris paribus*" (p.115). He extends this discussion to the labor market, listing a series of factors that cause higher monetary rewards.

Some more tricky cases, involving the pricing of time and distance are also discussed at length by Olivi, as described in the next section.

4. Capital Asset Pricing and Long-Distance Trade

There is no doubt in Olivi's mind that long-distance trade increases the common good in the community by increasing the diversity of the goods offered to buyers: "[…] many things are missing in a city or a region that abound in another region. However, those who are busy working in the fields, in the other mechanical industries, in public government or in the military cannot go easily and at the right time to various regions for purchasing the goods they need. Moreover, few have the appropriate industry and expertise. That's why it is useful for the community that some people devote themselves to this office, they must indeed receive a gain." (p.139). The latter gain confirms that long-distance trade is productive, as the same

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[10] Notice that the casual inclusion of "gold" among the goods whose value depends on their "abundance" could be interpreted as an early application of the quantity theory of money and prices, which will only be established 261 years later by Martin de Azpilcueta (1556), as mentioned below. However, it is too casual to be regarded as a clear statement of the theory.

good in a different place is a different good, produced by transportation to that place, as emphasized by Debreu (1966, p.33), and that traders need specialized skills.
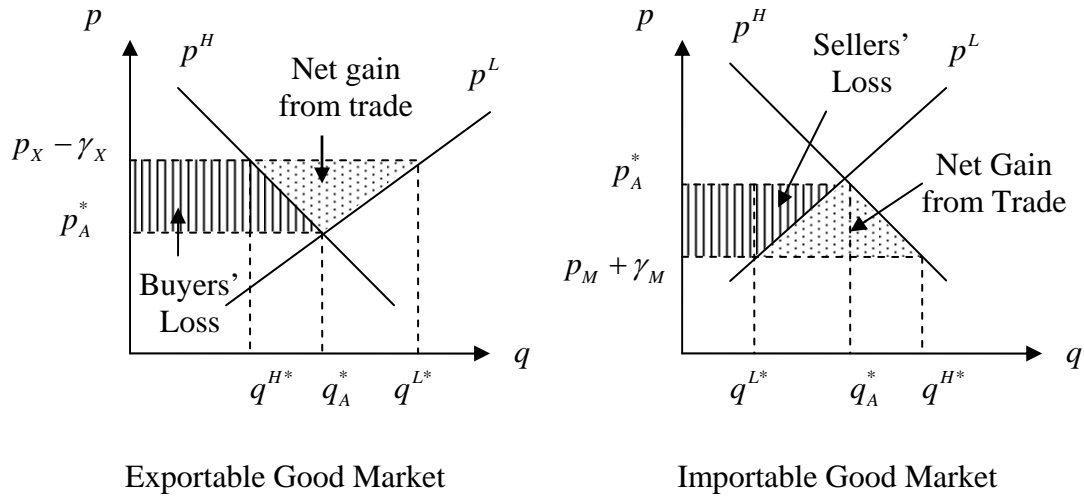
Figure 5: Community's Net Gains from Trade

Figure 5 is an extension of figure 4, allowing for long-distance trade, i.e., the purchase or sale of goods transported by merchants from or to a different region. The p^H and p^L lines are the same as in figure 4, and $\left\{p_A^*, q_A^*\right\}$ represent the equilibrium prices and quantities in the case of autarky, taken as the benchmark. Now, these markets are opened to long-distance trade, with p_x and p_M representing the prices prevailing in the other region where the exportable good will be transported and sold and from which the importable good will be purchased and brought back, respectively. These transportations involve a per-unit cost γ_X and γ_M, respectively, so that $p_X - \gamma_X$ is the net price earned on the exported good and $p_M + \gamma_M$ the total price paid for the imported good. The two diagrams show that the opening of trade with the other region yields positive gains from trade in both markets, shown by the dotted triangles. In the exportable good market, the gains of the sellers are larger than the losses of the buyers, depicted by the hatched area, therefore justifying this opening to trade advocated by Olivi. However, he does not mention the losses involved for the buyers, who are now facing a higher price that is driving some buyers out of the market. The trade-creation effect that allows sellers to sell more at a higher price more than compensates for the trade-diversion effect that leads the sellers to export more at the cost of selling less locally, where the prices go up in line with the other region's ones. However, this buyer's loss is not a

deadweight loss, just a transfer from the buyers to the sellers. A nearly symmetric outcome is found in the importable market, where the buyers can now buy at a lower price $p_M + \gamma_M$ than in autarky, allowing new buyers to enter the market, at the cost of the shrinking number of local sellers, outcompeted by the imported goods. Hence, although Olivi's diagnosis that long-distance trade is increasing the common good at the community's level is vindicated using the modern diagrams of figure 5, the latter also bring out his oversight of the redistribution effect entailed by the trade-diversion effects, which he does not discuss. However, historians have brought out many examples in medieval Languedoc in the 13th century of communities that restricted export of grain to avoid a painful rise in the price of wheat and bread locally (Bisson, 1964). Nevertheless, the simultaneous opening of long-distance trade for exportable and importable markets partly compensates these detrimental impacts by benefiting each side more than the other one in turn in these markets.

Instead, Olivi prefers tackling two theoretically more challenging issues raised by long-distance trade, which involves both transportation time and risk, which have some impacts on the pricing of the capital also involved in that trade. Taking both issues into account in his analysis of the pricing of capital invested in commerce enables him to take major strides in restricting drastically the scope for the idea of usury to be used against merchants. Olivi's key innovation in this field is to distinguish carefully "capital", a concept from the traders' jargon in the Western Mediterranean area at the time that he introduces into the learned literature, from idle and sterile money: "[…] capital […] in so far as it is earmarked for a profitable commerce, adds a lucrative character to money taken by itself in the same quantity that is not so earmarked for commerce; and so this character of capital […] may be sold above the price of simple money" (p.219). This is a major breakthrough in the messy literature on usury of that time, which was marred by Aristotle's idea of unproductive money. This enables Olivi to bring out the opportunity cost of lending productive capital, which is higher than that of lending idle money, which justifies adding an interest charge on top of the reimbursement of the capital. To pin down the key difference between productive capital and idle money, he focuses on the difference between 'lending' and 'renting': […] if one can truly recognize in something lent the character of renting and a use similar to that of a rented thing, then it is licit to demand a surplus" (p.185). A distant echo of this distinction is probably to be found in modern neo-classical economics, where the return on productive capital is called "rental rate" rather than "interest rate". To understand fully the next quote,

one must realize that he uses the concept of "probability", which is Olivi's second main lexical innovation, but in a not perfectly consistent fashion[11]. Piron (2012) points out in a footnote of his translation that Olivi is a bit imprecise in his use of the term "probability" (see Piron, 2012, p.366). Sometimes, it refers to the expected value of some variable, i.e., that variable times the probability: "[…] the value of the appreciable probability or of the probable expected gain that some commercial operation could yield with this capital […] has a certain value, appreciable by a certain price […], may thus be licitly sold" (p.217). He gives us an additional clue by noting that: "[…] this probability is sold at a price lower than the expected value of the future commercial profit made with this capital (p.217)." Ceccarelli (1999) emphasizes how important is Olivi's contribution showing that a game of chance is a perfectly licit contract, while breaching such a contract would be a sin.

Some simple modeling will help us understand precisely how Olivi views such a sale of that kind of lottery. Assume that S is the value of the sale made of some shipment of goods abroad, and $(1-\pi)$ is the probability of success of this operation. Let K be the capital advanced by the funder[12, 13], and $(1+r)K$ is repaid in case of success, with probability $(1-\pi)$ and rental rate $r>0$. In case of failure, with probability π, neither the merchant nor the funder gets anything at all. Then, the former's expected profit is:

$$P = (1-\pi)(S-(1+r)K),\tag{6}$$

and he breaks even *ex ante* if $r \le ((S-K)/K)$.

The funder's expected rent is:

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[11] Franklin (2015) confirms that Olivi is the first scholar to use the concept of probability, while also noting the ambiguity with expectation (pp.265-266).
[12] I have assumed here that K and S are exogenously determined, for simplicity. This suffices to make the point about the detrimental impact of enforcing the ban on usury by ruling out $r > 0$. The next section discusses the more elaborate case where $S = S(K)$, an increasing and concave function, which yields further insights.
[13] Olivi uses *traditor* in Latin, which may mean "the one who brings in", according to the Gaffiot dictionary. Piron translates it literally as "apporteur" in French, a very faithful but quite unusual word in this context. Both "investor" or "capitalist" looked a bit anachronistic to me, with potentially undesirable overtones. So "funder" seems a plain and neutral translation for *traditor* in this context.

$$R = (1-\pi)(1+r)K - K = ((1-\pi)r - \pi)K , \tag{7}$$

and he breaks even *ex ante* if $r \geq \pi/(1+\pi)$.
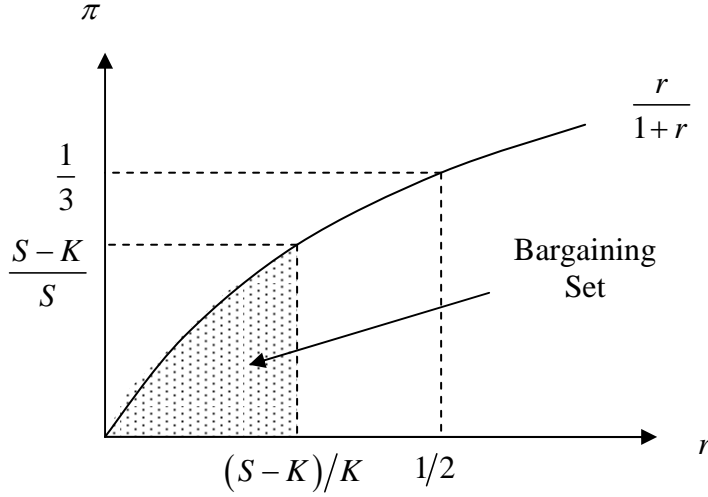
Figure 6: Bargaining Set between Merchant and Funder

Hence, we may think of K as the "price" paid now for the "probability" referred to in the quote above. It is clear that "probability" here means the expected value $(1-\pi)(1+r)K$. Equivalently, per unit of capital, 1 is the price paid now for the "probability" $(1-\pi)(1+r)$, which is also an expected value. Now, if the *laesio enormis* rule is in force, there is the additional constraint that $S \leq (1.5)K$, which entails $(S-K)/K \leq 1/2$. Let us now define the 'bargaining set' as the set of values of the $\{\pi, r\}$ pair such that both the merchant and the funder break even *ex ante* as defined above using equations (6) and (7). It is depicted in figure 6 as the dotted area. For any exogenous value of $\pi \in [0, (S-K)/S]$ it shows the range of values of $r \in [\pi/(1-\pi), (S-K)/K]$ where a deal can be made to fund the merchant's commercial expedition. Enforcing a narrow-minded interpretation of the rule prohibiting usury by imposing $r \leq 0$ under the threat of requiring heavy 'restitutions' from the funder would simply preclude long-distance trade of the type analyzed here unless $\pi = 0$. For higher values of π, the diagram clearly shows that the minimum rental rate required to induce the funder to advance the required capital K in the long-distance trade venture is increasing with

π along the concave curve labeled $r/(1+r)$, up to the point where $\pi = (S-K)/S$, above which the commercial project is given up, being deemed too risky to be worth the investment of capital.

Having made this point successfully, Olivi analyzes the two key determinants influencing the final choice of r within this range, namely the values of the time and risk involved. He takes as granted the fact that discounting the future is a standard practice: "[…] the more the claim on future things extends in a distant future, the cheaper it can be bought, *ceteris paribus*" (p.225). Then, he decomposes the cause of this discounting as resulting from the combination of two subjective proclivities, namely risk aversion and time preference, as we call them in modern economics. As far as the former is concerned, he writes: "The certainty of the actual thing or of its present ownership is higher and stronger than the certainty of a future thing or of the future ownership of a present thing. That's why […] one may licitly sell the former dearer and buy the latter cheaper" (p.225). However, this is not the only cause of discounting that he brings out, taking the example of a riskless bond to illustrate the role of pure time preference, as: "Even if they were certain, the way future revenues can be the more secure, the bond may be bought cheaper […] in proportion as the claim on forthcoming returns is worth more than a claim on more distant future returns" (p.229). However, this falls short of nailing down the issue of the precise determination of the rental rate r between the merchant and the funder. A glance at figure 6 shows that the "estimation" of the probability of failure of the project π should play a key part in this bargain. Olivi is a bit vague about this probability, trusting apparently the professionals involved in such an investment for finding "a price equivalent to the probability of the future gain as it can be reasonably estimated before the gain is realized" (p.213). This is consistent with his apology of the merchants cited above, where they are deemed "industrious in the subtle estimation of the goods' values", as well as "honorable and credible".

5. "*In Medio Stat Virtus*": Fairness and the Joint Determination of *r* and *K*

Let us now generalize a bit the model of renting capital for long-distance trade sketched above. To capture the fact that capital invested in long-distance trade is productive, as mentioned above, assume that the value of the sale made in the other region is an increasing and concave function of the capital invested in this commercial operation

$S = S(K), S'(K) > 0$ and $S''(K) < 0.$ Equations (6) and (7) must now be re-written as follows:

The merchant's expected profit is now:

$$P = (1-\pi)(S(K) - (1+r)K),$$ (8)

and his participation constraint becomes $r \leq ((S(K) - K)/K)$.

The funder's expected rent remains:

$$R = (1-\pi)(1+r)K - K = ((1-\pi)r - \pi)K,$$ (9)

and his participation constraint does not change as $r \geq \pi/(1+\pi)$.

This model is therefore akin to the 2 x 2 setting discussed in section 2 except that the quantity of the good changing hand K is now endogenously determined, together with the rental rate r. The two goods in this exchange are 'capital now' and 'maybe capital later'. The merchant and the funder must now strike a deal to determine jointly r and K within the bargaining set determined by their two participation constraints presented above. Although the $\{r, K\}$ space suggests the definite flavor of a supply curve of capital as a function of its rental rate, we have to take due account of the bilateral monopoly nature of this contracting problem[14] that precludes such an interpretation. This leads us to the wild field of bargaining theory, which offers a great diversity of solutions. The approach adopted here captures definitely Olivian features by blending insights from the Edgeworth box[15] and Kalai and Smorodinsky (1975). To represent the bargaining set in the $\{r, K\}$ space, let us start with the merchant's participation constraint, which rules out all the $\{r, K\}$ pairs located above the indifference curve where the latter is indifferent between launching the commercial venture or not, such that, generically for $\pi < 1$:

[14] See e.g., Layard and Walters (1978).
[15] See Mas-Colell et al. (1995).

$$P_L = 0 = (1-\pi)(S(K)-(1+r)K) \Leftrightarrow r = \frac{S(K)-K}{K}. \tag{10}$$

This is a hump-shaped concave indifference curve whose derivative may be written as:

$$\left.\frac{dr}{dK}\right|_M = \frac{S'(K)-(1+r)}{K}. \tag{11}$$

It thus reaches its maximum for $r = S'(K)-1$, i.e., along a downward-sloping locus where $dr/dK = S''(K) < 0$. All the other acceptable indifference curves of the merchant, i.e., on or below the curve described by (10), can be generated *mutatis mutandis* for higher values of $P > 0$ using the following expression:

$$r = \frac{S(K)-K}{K} - \frac{P}{(1-\pi)K}. \tag{12}$$

Figure 7 sketches the merchant's indifference map by representing his participation constraint and two other indifference curves for higher values of P, i.e., which are flatter as P increases.
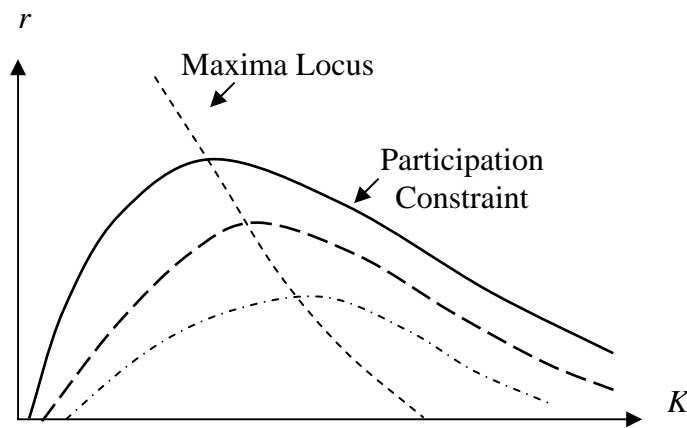
Figure 7: Merchant's Participation Constraint and Indifference Map

Similar steps can be taken to describe the funder's behavior. His participation constraint described at (9) rules out all the values of $r < \pi/(1-\pi)$ and all his acceptable indifference curves can be generated using the following equation for different values of R:

$$r = \frac{\pi}{(1-\pi)} + \frac{R}{(1-\pi)K}. \tag{13}$$

From (9), we can compute the funder's indifference curves' derivatives keeping R constant as:

$$\left.\frac{d\,r}{d\,K}\right|_{F} = \frac{-\left((1-\pi)r-\pi\right)}{(1-\pi)K}. \tag{14}$$

Therefore, they are all downward-sloping for $r > \pi/(1-\pi)$ and asymptotically tangent to the horizontal straight line $r = \pi/(1-\pi)$ as $K \to \infty$. Now, we can use the standard argument from the Edgeworth box literature that all the Pareto optimal contracts are found on the contract curve, i.e., the locus where the indifference curves of the two agents are tangent, which holds if the derivatives computed at (11) and (14) are equal. Some simple calculations show that this occurs if $(1-\pi)S'(K)=1$. This optimality condition could also be found directly by solving the following maximization exercise:

$$\max_{K} (P+R) \Rightarrow K^{*}(\pi) = S^{'-1}\left(1/(1-\pi)\right). \tag{15}$$

This finding shows that this bargaining problem between the merchant and the funder has a recursive structure, from a mathematical point of view. On the one hand, the two agents choose the optimal size of the operation $S(K^{*}(\pi))$ that maximizes the size of the cake to be shared as a function of the probability of failure π, and on the other hand, they choose the equilibrium rental rate r^{*}. Notice that this approach requires the two players to agree on a common estimate of the probability of failure π, but no inter-personal comparison of utility levels is involved. As mentioned at the end of section 2, Olivi was opposing the latter, which he found unrealistic, but he thought that this objection did not apply to probabilities, as

mentioned in section 4. Figure 8 helps us to understand how this works. We already know from figure 7 that the merchant's indifference curves have a hump shape, and that his participation constraint is graphically represented in the diagram by the highest of these hump-shaped indifference curves. No deal could ever happen for $\{r, K\}$ pairs located above that curve, as noted in figure 8. Point F^H is the highest point that could be reached if the funder had all the bargaining power to have it his way by taking the whole pot, and not leaving anything to the merchant. At this point, the former's indifferent curve, i.e., the downward-sloping convex curve, is tangent to the merchant's participation constraint. The bargaining set is bounded from below by the funder's participation constraint $r \geq \pi/(1-\pi)$, and no deal could occur below that horizontal line. Then, we have just proved that the two players will agree on the optimal size of their commercial operation involving a capital $K^*(\pi)$ that maximizes the sum of the gains $P + R$, under the assumption that they agree on a common estimate of the probability π. Point M^H is then the exact opposite of F^H, as it is the merchant that takes all at this point, sticking the funder on his participation constraint. This determines the vertical contract curve as the segment between M^H and F^H where the merchant or the funder gets the whole gain, respectively, leaving nothing for the other. The equilibrium point must then be found in that segment on or between its two extremes.
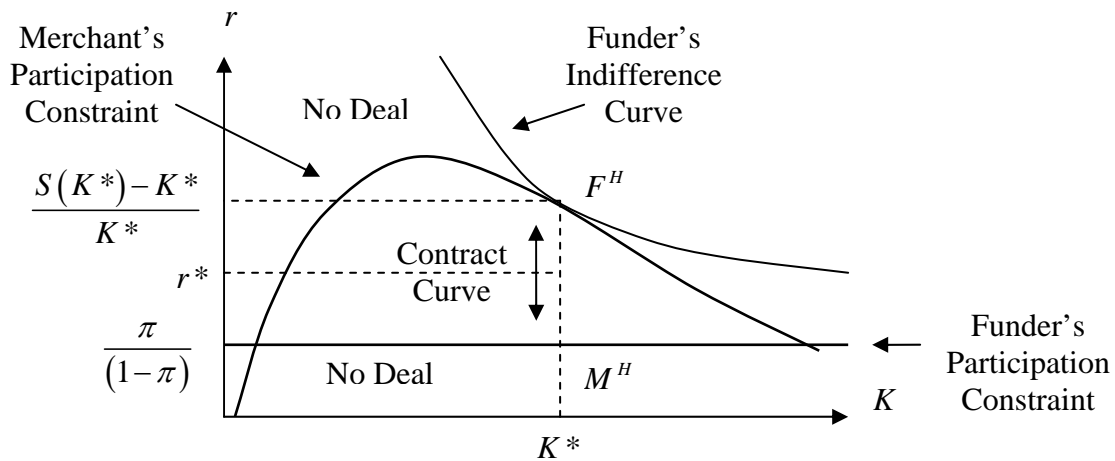
Figure 8: Optimal and Fair Equal Incremental Gains Equilibrium

Building on an insight from Kalai and Smorodinsky (1975), we can now understand why these two extreme points would not do as the equilibrium contract, and meet in fact Olivi again. Imagine that if they don't manage to find a friendly agreement, our two contractors

have to settle the issue in a conflictual way, where the contest-success function is stylized as tossing a fair coin to determine who will get the whole cake[16]. Then, a cooperative solution can match this random outcome in expected value, by computing:

$$r^* = \frac{1}{2}\left(\frac{S(K^*)-K^*}{K^*}\right) + \frac{1}{2}\left(\frac{\pi}{1-\pi}\right) = \frac{\pi}{1-\pi} + \frac{1}{2}\left(\frac{S(K^*)-K^*}{K^*} - \frac{\pi}{1-\pi}\right). \quad (16)$$

This fair rental rate looks like an Olivian "common estimate", at least between the two contractors, or an "average estimative value" in Turgot's preferred wording, as mentioned in fn. 4 above. The tie-breaking additional benefits enjoyed by the two agents when they choose this solution rather than the most exotic tossing of a fair coin to settle such an important issue, are not pecuniary but are found in the reputational impacts of their harmonious contract, "so that no party disagrees with his own group in a shameful, irregular and disorderly fashion […]", as mentioned in section 3. However, this outcome could not be implemented if the confessors were insisting on the prohibition of usury and its ban under the threat of a punishing "restitution". This model thus brings out an additional benefit brought about by a well chosen positive rental rate for the two agents as a form of insurance against extreme outcomes. Choosing r^* rather than either one of the extreme values protects their reputation as being "honorable and credible", as claimed by Olivi in his apology of merchants cited above in section 3.

What was definitely exposed to a high risk was Olivi's legacy. He was excommunicated after his death, his grave desecrated, and his books sentenced to be burned. This was not because of this *Treatise on Contracts*, but mainly because of his *Comments on the Apocalypse*, written in the Joachite tradition shortly afterwards[17]. It announced the end of "the carnal church" and the coming of the "age of the spirit", with a very strong popular following in Languedoc and elsewhere in the Mediterranean world.

6. The Survival of Olivi's Threatened Legacy

Olivi died in 1298 and was buried in Narbonne. Then, over the years, a popular cult developed and a lot of people of all kinds of origins, including priests, friars, and lay persons,

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[16] See Mas-Colell, *et al*. (1995) (p.844) for this interpretation.
[17] See Burr (1993) and Burnham (2008).

used to congregate around his grave (Burnham, 2008, Burr, 2001). Some of them were coming from far away. Many of these pilgrims thought that miracles were occurring there and they all wanted Olivi to be canonized. Na Prous Boneta, among others, testified that she felt Olivi's presence, as if he was communicating directly with her (Burnham, 1999, 2008). She was illiterate, but she surprised the inquisitors by her deep knowledge of Olivi's theories. This was due to the groups frequently gathered in the area reading Olivi's writings aloud to instruct the illiterates (Burnham, 2008). To put an end to this kind of "popular canonization", the repression started very early in 1299 and dragged on for more than three decades. Eventually, some of these worshipers, including Na Prous Boneta and several Franciscan friars were burned at the stake and Olivi was excommunicated, his grave desecrated, and his remains (28 years after his death) were burned and dispersed. Moreover, his books were condemned, and order was given to destroy them under the threat of severe punishment for those disobeying this order. Fortunately, some people did not comply, and some copies of his books were saved, copied, and widely spread in Europe. For example, a high-quality copy of the *Treatise on Contracts* can be found at the Bodleian Library in Oxford, copied by John Maynesford, fellow of Merton College circa 1425-1440 (see Piron, 2012). This section aims at bringing out some salient characters that played a key part in keeping Olivi's impulse alive in the field covered by the *Treatise on Contracts*.

Guiral Ot, a.k.a. Gerald Odonnis, is probably the most decisive agent that saved the manuscript and spread its message at the time when it was the most dangerous to do this. He was a Franciscan friars mainly based at the *Cordelier* convent in Toulouse. Ceccarelli and Piron (2009) provide an exhaustive narrative and historical analysis of his contribution to the survival of Olivian economics. They suggest that he got access to a copy of the book from the archives of the provincial minister of Aquitaine in Toulouse where several confiscated copies were stored. He most probably wrote his *Tractatus de Contractibus* between 1315 and October 1317. Ceccarelli and Piron claim that Olivi's book was "by far the most important in Gerald's treatise, to such an extent that the latter can be described as a reformulation of Olivi's, complemented by other sources" (p.176). These authors explain first the need for some complements by the political changes that occurred during the two decades separating the publication of Olivi's treatise and Odonnis' writing of his own version. For better or worse, the reign of Philip the Fair in France entailed a mutation from a fairly decentralized feudal system, where cities like Narbonne or Toulouse still had some forms of autonomy to a much more centralized and intrusive Kingdom. However, Olivi was already aware of the

damage inflicted by the new demands made by the King, as well as by currency debasement, a prominent practice widely used by Philip the Fair. Olivi wrote: "All usurpation or exaction […] violating just and approved rights […] must absolutely be "restituted". "[…] There is usurpation not only when it is done in a violent way, but also when it has a hidden character of violence, as […] the requests made by the King to his subjects very often do" (p.271). "That's why, all those who melt large coins, leaving only the smaller ones of the same type, have to repay the damage thus inflicted on the public weal" (p.271). Then, Ceccarelli and Piron bring out many new ideas published between Olivi's and Odonnis' books, which the latter took on board. However, Odonnis' book was not a dead end, but a step forward for Olivi's ideas, as Baeck (1994) mentions that Jean Buridan (1301-1358), a lay scholar in Paris, published circa 1340 some comments on Aristotle's *Ethics*. This book attracted some comments from several readers that Baeck (1994) summarizes as: "The affinity with the *Ethics* of Gerald Odonnis […] is striking" (p.171). He held various positions at the University of Paris, and his work was republished many times, even in the 16th century.

The next important player in the survival of Olivian Economics was another Franciscan friar, namely San Bernardino of Siena, born in Massa Maritima in 1380, from a well off family, as his father was the governor of this town, in the Republic of Siena (De Roover, 1967). He joined the Franciscan order in 1403, after having shown a selfless sense of compassion during the pestilence of 1400 to nurse the stricken (De Roover, 1967), and started a career as a preacher in 1417. De Roover (1967) summarizes his activity during that period as follows: "Eventually, he toured all of northern and central Italy, drawing huge crowds to his sermons" (p.3). However, following in fact the persecution pattern already seen at work against Olivi, he was accused of heresy, and he was called to Rome to answer this charge. Unlike Olivi, he was cleared by the Pope. He then took two years off from street preaching in 1431-33 at the small friary of La Capriola near Siena, and De Roover conjectures that he composed his Latin sermons during that period, although he kept revising them at each visit to that place (p.3). Predictably, Bernardino never cited Olivi's name in his writings, because of the latter's excommunication. Nevertheless, there are several proofs that Bernardino had access to a copy of Olivi's book, mentioned by De Roover: there is first a letter from La Capriola to the Friary of La Verna to borrow an Olivi manuscript. Then, the most striking evidence is that "the entire section on utility in Bernardino's sermon thirty-five was lifted almost word for word out of a treatise by Pierre Olivi entitled *Questiones de permutatione rerum, de emptionibus et venditionibus*" (p.19) (now included in Piron's translation). This is

the main source for sections 3 and 4 above. A copy of this treatise is found in San Bernardino's archives, with hand-written marginal notes clearly of his own hand, showing (i) that he knew that this treatise was written by Olivi, as he marked the copy with the initials "P. I", for *Petrus Johannis* (Piron, 2012), and (ii) that he read carefully the text and "fully realized the significance of the passage" (De Roover, 1967, p.20). These marginalia can be found in Piron's translation. Moreover, Piron (2012) suggests that Bernardino had access to two copies, using one to correct the other (p.81). All this evidence led De Roover to conclude, with a touch of nostalgia : "For a long time I thought [San Bernardino] was also very original, but I now may have to revise my judgment […] because he borrowed so heavily from Pierre Olivi's treatises on contracts: one on usury and restitution, and the other on purchases and sales." (p.42) (these two treatises are now part of Piron's translation). My guess is that selfless Peter Olivi would have rejoiced to see that such a man of the stature of Bernardino of Siena had kept his analytical framework alive and spreading, proving that plagiarism is much preferable to disregard, as far as the life of ideas is concerned. Bernardino died in 1444 in L'Aquila, and he was canonized by Nicolas V in 1450. Unlike Olivi's in Narbonne, his claimed miracles at the church of the Conventuals were validated by Rome.

Bernardino's early canonization, which ironically owes so much to Olivi's work and Bernardino's clever and faithful use of it in preaching very large enthusiastic crowds in northern and central Italy, gives us a potential clue to explain the next big jump performed by Olivian Economics, back to Languedoc. Martin de Azpilcueta a.k.a. *Doctor Navarrus* was born in 1492 in Spanish-speaking Navarra and he earned a bachelor degree in theology at Alcalá University in Spain (Muñoz, 2014). He was a Dominican friar and completed his training at the Law School of Toulouse University. He got his doctorate in Canon Law in 1518, and then taught at Cahors and Toulouse for a short period. He then moved to found the School of Salamanca, and by 1524, "he had served in several canon law chairs at the University of Salamanca" (Muñoz, 2014, p.*xxii*)[18]**.** He is quoted as claiming: "Nobody denies that I brought from Tolosa, in France, to the University of Salamanca […] the solid and useful science of Canon Law" (Muñoz, 2014, p. *xxii*). Grice-Hutchinson (2015) reports that he was an innovative and very successful professor as "he introduced a new method of teaching civil law, combining its exposition with that of canon law. This innovation, and Azpilcueta's vast learning, drew large audiences in his lecture room" (p.100). His book: *On Exchange. An*

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[18] On the School of Salamanca, see Alves and Moreira (2013), Baeck (1994), Grice-Hutchinson (2015) and Rothbard (1995).

Adjudicative Commentary (1556) includes distinctive Olivian ideas on long-distance trade and finance, justifying in particular a positive rental rate on the capital so invested, depending on the duration of the loan and rejecting strongly the idea of "usury" in this context. He concludes: "without this kind of deal, the deals with foreign kingdoms would disappear, and one's own kingdom would impoverish itself" (p.120). Its original contributions include the first statement of the quantity theory of money, as mentioned in fn.10 above, and the price-specie flow mechanism that David Hume would rediscover *circa* 1750. As a Dominican friar, he could neither cite Peter Olivi, because of his excommunication, nor Bernardino because he was a Franciscan, the direct rival preaching order. The latter argument might also explain why he did not cite Odonnis, whose book was probably available in Toulouse when he studied there. Lesnick (1989) provides a thrilling and thoughtful analysis of this competition between the two mendicant orders in the city of Florence at that time, made somewhat softer by a form of stratified social discrimination. The Dominicans had developed strong ties with the mercantile elite, *il popolo grasso*, while the Franciscans targeted *il popolo*, i.e., the humbler artisan class. This social class specialization probably existed as well in many other cities, fueling possibly the hard-liner Franciscans' harsh resentment about their order's drift to a more lenient approach to material wealth, resulting in the "Spiritual" protest movement, and then persecution, already mentioned above (Burnham, 2008, Burr, 2001). So, in his *On Exchange* book, Azpilcueta cites Sant'Antonino of Florence, a slightly younger Dominican preacher contemporary with Bernardino. De Roover summarizes the relationships between the two as: "Of the two, San Bernardino was apparently the greater theorist, the more logical thinker, but Sant'Antonino was more a casuist and excelled in applying ethical principles to specific problems and concrete situations" (p.7). One might see a distinctive Olivian influence in this more theoretical bent of Bernardino's, but De Roover's whole paper shows that in fact, their positions on most problems were quite congruent, albeit with significant stylistic differences and slight nuances on many points. Rothbard (1995) calls Sant'Antonino "the disciple" (p.85), and claims that "he simply repeated the views of the truly great and creative thinker" (p.86). It would be very surprising if this did not reveal some Olivian spill over, from Bernardino to Antonino, rebounding in turn onto Azpilcueta. Unsurprisingly, the Franciscan Bernardino turned down several offers to become a bishop, while the Dominican Sant'Antonino accepted one without second thoughts. Then, the question might be: how is it that a doctoral student at the Law School of Toulouse University like Martin de Azpilcueta managed to be aware of Sant'Antonino's work in the early sixteenth century? It turns out that a famous professor from Toulouse Law School, Bernard de Rosier, who became in due course

the Archbishop of Toulouse, was present and spoke in Rome in 1450 when Bernardino was canonized, as mentioned by Arabeyre (1992). It is then not unlikely that some of the work performed by the two Italian saints percolated in his teaching, and was passed on to the subsequent generations after his death in 1475. Similarly, some copies of their works might have found their way in one of de Rosier's stagecoaches to some of Toulouse University's libraries, where Azpilcueta might have found them, or some copies of them, some six decades later. However, he might as well have found Sant'Antonino's piece directly in Salamanca, he had plenty of time for that between his arrival there, circa 1524 and the writing of his *On Exchange* book in 1556, or even for ordering a copy himself.

7. Conclusion

This paper has shown basically two points that are relevant for understanding the lasting influence of "Olivian economics", i.e., the theory of prices that he developed in his book *Treatise on Contracts*, published in Narbonne (Languedoc) in 1295. The first one is obviously its novelty. Although some of his points had been discussed by previous authors, it was the first time that such an ambitious theoretical framework was presented in a clear and consistent fashion, while deeply grounded in a rich observation of the real world where merchants and ordinary citizens daily interact to purchase and sell the goods that the former have and the latter want. People could recognize themselves in the agents described in the book while benefitting from the better understanding of the economic environment that could sometimes be perceived otherwise as rather mysterious. They probably clearly got the main message that prices and transactions are not imposed by any superior authority but emerge instead from the daily interaction of a large number of people who mind their own business in a rational way using the information provided by prices determined collectively under the mild control of social reputational effects. They realized that merchants and traders are providing very productive services by discovering market opportunities, collecting and spreading relevant information, and importing scarce and expensive goods or exporting goods whose local abundance depresses their prices. Even in complex and often secretive activities like long-distance trade, they understood that some soft social control is at work because no merchant or banker can afford to damage a valuable reputation by adopting a shameful or outlandish behavior. They thus understood that the clerical interventions aimed at enforcing the "just price" and the ban on "usury" were at best useless or even potentially damaging for the common good by preventing some much needed economic activity from happening.

Such a set of useful and convincing ideas deserved to be spread largely in the community but were threatened to disappear as collateral damage of the ecclesiastic repression of the spontaneous popular support that Olivi's ideas attracted. As Olivi's grave in Narbonne was attracting pilgrims of various origins, clerics, friars, and lay people as well, the clerical authorities tried to cancel his influence by excommunicating him, desecrating his grave and destroying his memory by burning and dispersing his remains. People were summoned to surrender any books of his that they held to the clerical authorities and were threatened to be burned at the stake in case of non compliance. The brief and patchy prosopography presented in the last section shows that a small and rising network of dissenters managed to prevent the cancellation of his legacy, keeping in particular his price theory alive. In the following centuries, this passive civilian disobedience had enabled his *Treatise on Contract* to be available and spreading (by plagiarism sometimes) in such important cultural cities as Toulouse, mainly via Gerald Odonnis in the 14th, Paris, where Jean Buridan managed a little later to plagiarize the latter's book, itself plagiarizing Olivi's, and Siena, where the future San Bernardino of Siena was preaching Olivi's economics in front of huge crowds, and elsewhere also in northern and central Italy in the 15th century. He was canonized in 1450 five years after his death, basically for having preached so convincingly Olivi's economics. At about the same time, we know that Olivi's *Treatise on Contracts* was available in Oxford, as John Maynesford bequeathed a copy of it to his college, circa 1440. A very important mouthpiece for Olivi's ideas was the foundation in the 1520s of the School of Salamanca by Martin de Azpilcueta, who got his doctorate in Canon Law at Toulouse University in 1518. He published some work on long-distance trade in 1556, which is deeply branded by Olivian ideas. Many debates started in later periods discussing whether Olivi's long shadow spilled over to other places and other times, anonymously most of the time. Quite recently, in 2018, an acrimonious debate started in Spain between Jesùs Huerta de Soto and Daniel Marìn Arribas (2018) to determine whether the ideas of the modern Austrian School are rooted in those of the School of Salamanca. This type of issues must be left to further research.

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