The future of the European Common Agricultural Policy : a new philosophy ?

Working paper
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Abstract

On actual agricultural markets, price rarely equate marginal cost. Thus, agricultural policy should be focused on market failures, as was the 1960 CAP which, unfortunately, neglected supply management. Under certain conditions, a generalized "quota" system would in addition provide safer instruments for environmental policy.

Keywords : Common Agricultural policy; Price volatility; State intervention; market failure; supply management.

Since 1992, the European Union Common Agricultural Policy has been the object of many reforms, most of them directed toward increasing the role of market in the choice of productions natures and levels. While, in the original 1960 implementation, with administered prices, all main agricultural productions were disconnected from markets, now, most of them are sold at market price. There still exist a few quotas, and "intervention prices", as "safety nets". But, because of low guaranteed prices, quantities under quotas are not always produced, while the mesh of the nets is wider and wider.

This does not mean a withdrawal of the State from the management of agriculture, quite the contrary. An increasing share of the agricultural budget is spent as "decoupled" payments, that is, lump sums payments which, at least in principle, should not modify the marginal cost of production, and, therefore, should not interfere with markets. These payments to farmers are made for two different sorts of reasons: one is linked with vested interests, because farmers, historically, through price support, got large incomes which cannot be removed at once (Gardner, 1992). The second is a consequence of the lack of markets for

externalities: since there are no prices for landscape or other agricultural amenities, no more than negative prices for pollution from fertilizer or pesticides, and since there exist reasons to create amenities or avoid pollution, the State may create some sort of artificial markets for these goods, generating incentives for "good practices". Combining both approaches results in granting farmers large subsidies subject to "eco-conditionality" restrictions.

The shift from "pillar 1" (market related) and "pillar 2" (rural development) expenses has been impressive (EC, 2002). Indeed, until recently, pillar 1 was to be progressively made pointless, while the more politically rewarding pillar 2 had to be expanded, so that the only remaining question regarding the future of the CAP was at which rhythm the shift can be conducted, and how to make it working without too much complaints from entrenched habits.

Yet, pillar 1 shrinking rhythm is not what this article is intended to deal with. On the contrary, it develops the idea that pillar 1 is still the most important and reasonable aspect of the CAP. If the European Sate were to pursue the present dismantling policy, under the pressure of necessity, other institutions would probably fill up the gap left by the removal of market management instruments. It would probably not be the end of the CAP, because such an institution can very well survive its necessity. But it would certainly be the end of its power on the European and world agriculture. First the theoretical reasons which induce this thinking will be examined. Then, a few political sciences considerations will be developed.

I – WHY IS IT NECESSARY FOR POLITICAL AUTHORITIES TO CARE FOR AGRICULTURAL MARKETS?

The key consideration here is that agricultural markets are not working properly. This is the only and sufficient reason for State intervention in production decisions.

The most obvious market failure is precisely what Pillar 2 is supposed to bring correction to. As we have seen, is has been originally designed for, as far as possible, recreating markets where they are missing. Notice these "externality markets" are largely token ones: for, of course, the problem is not (or not primarily) to allocate pollution rights or amenity production quotas between producers, but to decide which pollution level is admissible, or which amenity is demanded in which quantity. For this, no market indications are available in any way. What the "externality markets" can only do is, assuming the Society's wishes are known (through electoral processes, enlightened despots, or any other mean), to enforce the decisions taken by political authorities at lower cost. This is important, but not essential.

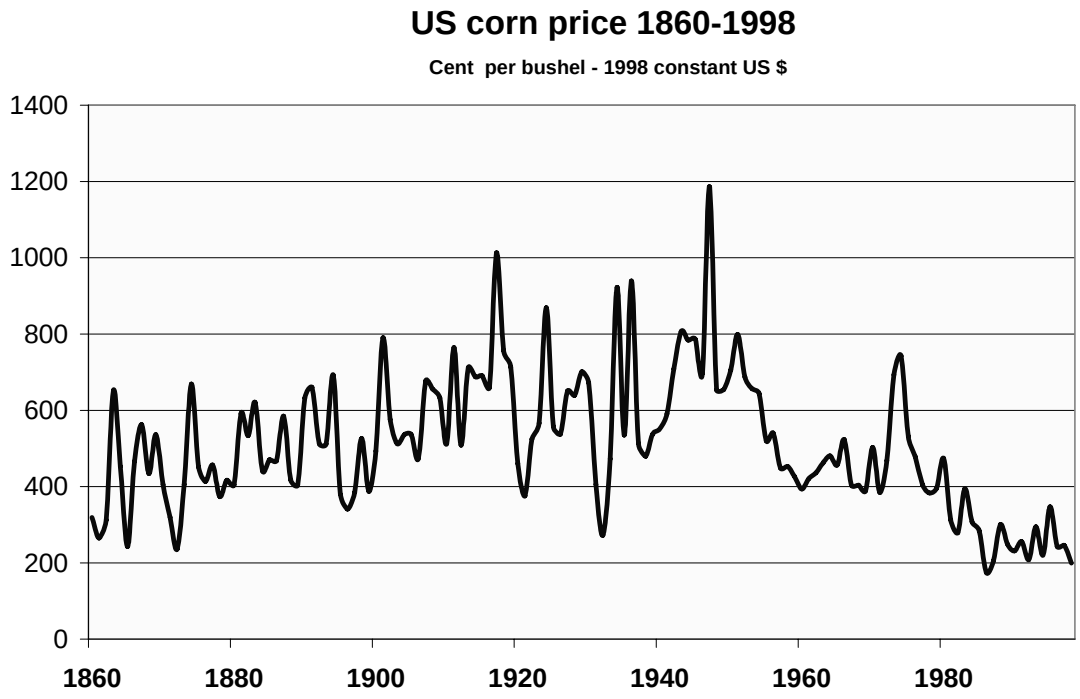
The strange thing is doing that – in the pillar 2 framework – completely independently of pillar 1 considerations: for pollutions, amenities and commodities are obviously joint agricultural products, and jointness is notoriously a difficulty in production economics. Further researches should (and are) undertaken in order to grasp all the aspects of the problem. Yet we shall not pursue this discussion here, and just concentrate our attention on the strict pillar 1 issues – the commodity market failures.

Idly functioning markets : testimonials

Indeed, if markets were working as they do in first grade economic courses (that is, marginal cost equating price, thus maximizing the joint consumer and producer surpluses), no

pillar 1 type agricultural policy would have ever been necessary. If such policies were progressively set up during the course of history, it is because such situation only rarely occurs. Indeed, most of the time, on actual agricultural markets, prices do not equate marginal costs. This can be show on the most casual agricultural commodity time series. Figure 1 shows the price of corn in constant 2000 US $ since 1860. Nobody can seriously imagine the marginal cost of corn being 513 in 1910, reaching 764 in 1911, and coming back to 508 in 1912… This is but an example: similar jumps can be observed with almost any available agricultural commodity free market price in the world.

Figure 1 :



This fact kills the key argument for letting markets operate freely. In the absence of relation between costs and price, markets lack all pretence to optimality. On the contrary, market interventions might very well lead to second best optimality, with price closer to "true" long run marginal costs. The advanced economic theory brings some support to this assumption[1].

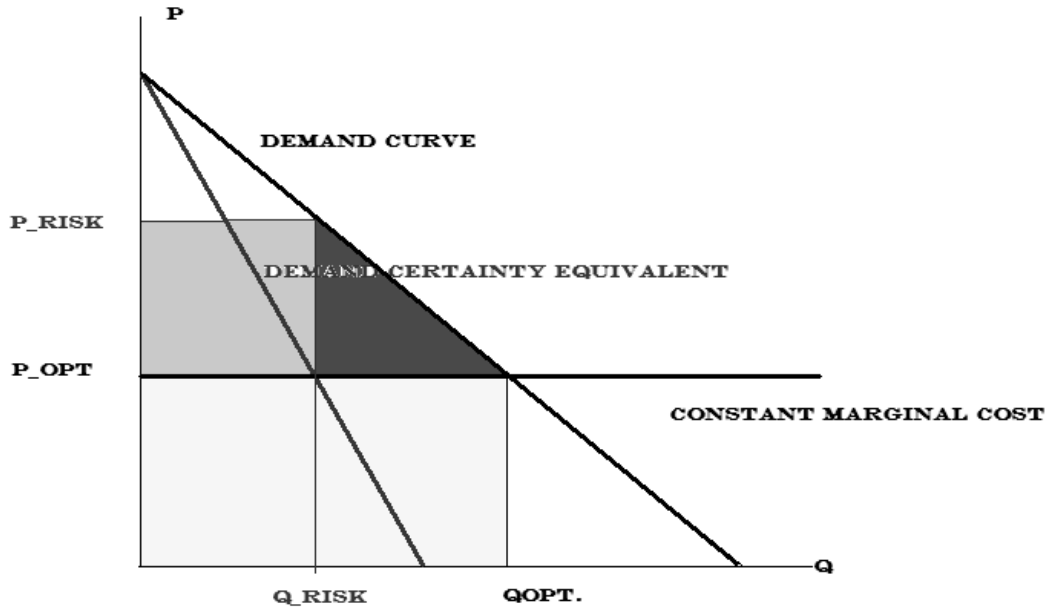
Most of the time, farmers are risk averse[2]. A risk averse producer does not equate marginal cost with the mean, but with the "certainty equivalent" price. The certainty equivalent is normally far below the mean price, the more as price volatility is larger and the farmer poorer (figure 2) . This means that with volatile prices, production is constantly below the optimum (in Pareto sense) level. Many models support this view. Let us only recall the

[1] A considerable body of literature was devoted to this topic during the 50's and the 60's. Perhaps because it is not easily found on Internet, it seems to have almost entirely forgotten recently. See Waught(1944), Massel(1969, 1970), Newbery and Stiglitz (1981), Schmitz (1984), , and many others, including dissenting Oi (1961)

[2] The fact has been challenged. Serious papers, such as Binswanger (1980) provide evidence that even third world farmers might actually be risk lover. This is certainly formally true. In fact, this conclusion relies upon subtleties in the definition of risk aversion (see for instance Kimball, 1990). In practice, everything goes "as if" they were really risk averse.

famous article by Freund in *Econometrica,* 50 years ago (Freund, 1956). In Freund's experiment, a linear programming model of North Carolina farmers was built, first, "without" and then "with" risk considerations. In the first case, the average expected income was maximized, instead of a certainty equivalent in the "with risk" situation. While the former resulted in a quasi monoculture of the most risky crops, the latter's optimal solution was diversified and similar to actual crop patterns. Of course, in the second case, not only was the representative farmer's benefit smaller, but it was also made of a significant "risk premium", with, therefore, marginal costs far below expected prices.

Figure 2 :
Non optimal equilibrium with risk



Observations also confirm this analysis. For instance, if we consider the US corn series on figure 1, a "break" is clearly visible[3] in the 1940's : before that date, corn price is volatile and almost stationary (or slightly increasing). After, it is much less volatile, and decreasing. Indeed, most statistical time series breaks detectors indicate such an event in this series in the late 30's. Now, 1940 is also the date at which US price support policies begun taking effect. It is tempting to conclude that, far from standing as an outrageous rent paid to farmers at tax payer's expense, US price support policies rather benefited to consumer, through lower food cost. Of course, the fall of US corn price after production was disconnected from market can be only a mere coincidence. Yet, there exists evidences (Boussard and Gerard,1994) of positive links between price stability and production growth everywhere in the world.

Thus, both observation and theory suggest that price stability could lead to a more efficient agricultural system. That was the key motivation for the 1960 CAP setting, following earlier similar policies (especially, US) established in the late 30's. Now, in the late 80's,

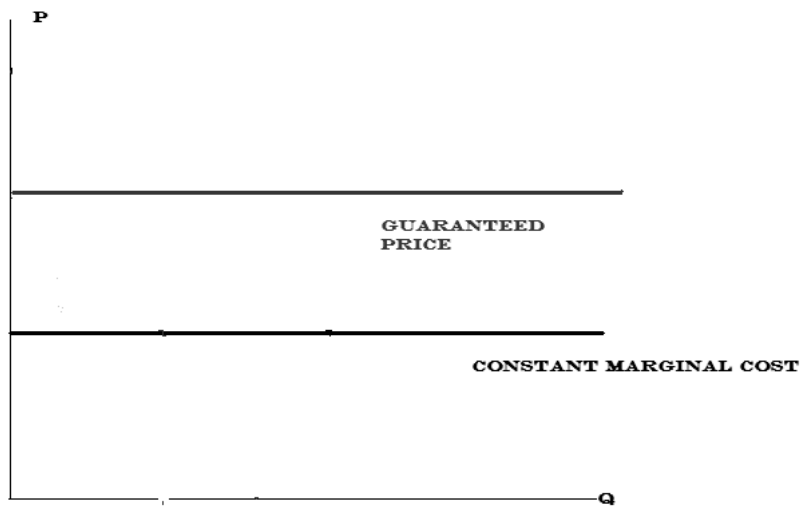
[3] it is also detected by these statistical tests which serve to detect breakpoints in time series, as those described by Fernandez(2004).

these policies (both US 1935 AAA policies and the CAP) has been deemed failures– the 1992 CAP reform being a mere consequence of this analysis. Where was the problem ?

What was wrong with the 1960 CAP ?

A natural idea for dealing with (apparently) random events such as agricultural price fluctuations is insurance. But it is difficult to insure prices, because prices are high or low for everybody at the same time. Therefore, even assuming random "iid[4]" prices, risk sharing must be done throughout time, "bad" years being compensated by "good" ones[5]. This raises enormous financial problems which can hardly be left to private insurance firms, so affluent they might be. On the other hand, governments can very easily do it[6]. If they decide that the domestic price will be once and for all set at the equilibrium level, this decision being enforced by an adequate system of variable levies and subsidies at the border, in the long run, the cost of the policy should be zero, while the production and consumption system should behave exactly as with a smooth and efficient free market. This was the rational behind the 1960 CAP - a perfect price insurance system.

Figure 3 :
Absence of equilibrium with guaranteed price



Yet, there was a flaw in the reasoning (figure 3): prices fluctuations are not random, but they depend upon supply and demand. In the case of agriculture, supply in the long run is fairly elastic, because the production function is homogenous of degree one: if a technique is feasible and profitable over one hectare, it can be reproduced over millions of hectares. Elementary economic theory shows that, in this case, the marginal cost is constant and the

[4] Independently identically distributed
[5] As noticed 4000 years ago by the Bible, with the story of Joseph, the Pharaoh prime minister. Notice that Joseph's policy ran into an international liquidity crisis, for, after a while, people in the Middle East had no more "gold nor silver" to pay for Egyptian stocks. cf *Genesis*, 41-42 and 47
[6] This is the old argument by Arrow (1970)

supply curve is flat, parallel to the x axis. Of course, this is not completely true, because fixed factors, such as land, cannot be expanded without limits. But the share of land in agricultural production cost is too small for the slope of the supply curve to be large, so that, in practice, everything goes as if the supply curve was indeed nearly flat. Now, with a fixed price, the demand curve too is flat, parallel to the x axis… and two parallel lines cross over at infinity. Here is the explanation for the failure of the 1960 CAP (and all similar policies in the world, being wheat in EC, or cocoa in Ivory Coast): with fixed price for unlimited quantities, production always tends to supersede demand, whatever the price… And, of course, in such a setting, the policy cost becomes quickly insuperable[7].

What could have been done ?

We have just seen that, in this context, authorities are considering coming back to free market. Of course, this is absurd, since coming back to free market will not suppress the reasons which were at the very origin of its abandonment[8] At the same time, it looks like the only feasible escape from overproduction, and there are hopes that new institutional innovations could at least alleviate the inconvenience.

Indeed, futures markets give the possibility for a farmer to be absolutely sure, at planting time, of the price which is to be paid at harvest time, and to make plans in accordance. In many analysts' views, futures markets allow farmers equating marginal cost and future prices, thus bringing back market efficiency. This would be true if futures were determined over a time horizon long enough to match farmers planning horizons, if they were not too much volatile, and if the risk premiums requested by speculators (who "sell security against risk", but at a cost) were not too large. None of these conditions are met. This must be the reason for why few farmers actually make use of such devices, as noticed by William (2001)°

Yet, a very natural idea to overcome the difficulty of overproduction is to put a bound on the government price guaranty: a relatively high price would be granted up to a certain quantity, while any quantity produced in excess of this "quota" could be sold at market price. Such a solution, supported by serious economists (such as Hazell and Scandizzo, 1977) was proposed in the US at the end of the 80's, under the name of PEG (Payment entitlement guarantee). It is described at length elsewhere (Boussard, 2005). It can be interpreted as a kind of future market, with the government playing the role of a risk buyer speculator at virtually no cost. It is not distorting, since, ultimately, quantities sold on the "free international market" should be produced at marginal cost, provided the sum of allocated quotas be less than domestic consumption[9]. That such simple an idea has always been considered with reluctance by politicians and economists is indeed very strange.

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[7] This outcome of the 1960 PAC had been predicted by Colin Clark (1962). Unfortunately, this caveat was not understood at the time.

[8] Notice "free market" is rather natural an institution, the flaws of which, precisely gave rise to all agricultural policies in the History. .

[9] It would also be necessary that producing at world price beyond the quota limit be allowed, contrary to what exists with EC milk quotas. Notice the WTO dispute settlement body recently judged that US domestic cotton subsidies were not decoupled, because these subsidies were lowering US cotton marginal cost. This is at least discussible.

II – POLITICAL ECONOMY CONSIDERATIONS

Why are policy makers so reluctant in face of market regulation?

Several reasons can explain the reluctance for supply management.

a) The bad repute of the rents associated with "quotas": since, in order for the production under quota to be secured, the "under quota" price must be fairly greater than cost (otherwise, the quantity under quota would not be certain to be produced), farmers get a profit from holding quotas. Most neoclassical economists are rightly severe against rents.

Now, it remains to be ascertained if rents should be necessarily avoided. They can be recommended in certain cases: for instance, nobody, apparently, complains about rents derived from patents. This is because, (rightly or wrongly) the benefit of such patent rent are deemed necessary to encourage research and innovation, which, otherwise, would be deprived of any market.

In the specific case of the rent associated with production quotas in agriculture, it could be justified by a similar argument: the difference between price and average cost, in this case, is indeed a price paid by consumer for food security and technical progress, since, in the absence of such a device, farmers would be reluctant to invest and innovate. The price, in this situation, could rise at levels endangering food security, at least for the poor. Undistorting production quotas, as defined above, would avoid such a situation. Then, why complain about quota rents[10] ? Moreover, the "quota rent" can very well reduced to a small value if the authorities are wise (and powerful) enough to revise quota price at regular intervals, tacking account of technical progress and changes in production costs.

b) Most politicians are persuaded that the reason for setting an agricultural policy is to guarantee a minimum income to farmers. This is the rational for limiting the decoupled payments beyond a certain limit: "big" farmers need not income supports.

It is a strange vision: governments are not established to secure farmers income, no more than the income of any other citizen. Government cannot have any other objective than to provide minimum welfare – including food security - to *all* citizens, and not farmers only. Then, why is farmer income support so easily deemed necessary? Simply because it turns out that it would certainly be difficult to provide food security without farmers. Indeed, they must not be swept out by the first crisis occurrence. This is the reason for why the Stresa Conference mentioned farm income as one of five objectives for the CAP. But the term "objective" was surely misshapen, the more as it is not possible to optimize five objectives simultaneously. Indeed, the farm income objective is secondary, and should not be presented as a first best. As a consequence, the right to get decoupled government payment whatever the circumstances is certainly much more abnormal than any kind of price support[11].

In addition, mixing equity and efficiency considerations is awkward, even in the eyes of the most orthodox economists. Efficiency requires factors being consistently priced and made use of, whatever the distribution of the incomes they generate. The distribution itself

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[10] Indeed, assuming stabilisation could be achieved through futures markets, the risk premiums to be paid to speculators would largely exceed the rents paid to quota owners…

[11] This anomaly is particularly evident this year, where large payments will be made to farmers already benefiting from high prices.

depends upon the nature of the rights peoples hold on factors. Thus, if more equity is required in farming, it would be wiser to change the nature of the rights (for instance, the property rights) rather than the (implicit) price of some of the factors through which subsidies are distributed (in the present case, the land and labour shadow prices of the large farm owner)[12].

c) The very source of price fluctuations (and therefore, the strategies for bringing remedies) are not understood. Of course, everybody agrees that large agricultural price fluctuations are caused by small changes in supply which are magnified by the low demand elasticity for food. But few analysts recognize market failures behind supply changes, which are generally considered as "exogenous", engendered by climate or pests, out of any human control. Yet, if climatic or other circumstances can very well jeopardize local harvests, the question is open of the consequences of this sort of events for global markets: can a drought occur simultaneously in Australia, North America and Europe? This is not very likely.

On the contrary, since Ezekiel (1938), the author of the "cobweb model", the local instability and "repelling" properties of agricultural markets equilibrium points is notorious. With a repelling equilibrium point, the way is paved for chaotic[13] behaviours in the agricultural commodity supply and demand dynamics (Alligood *et al.*, 1997). Now, the global properties of a chaotic system are completely different from those of an exogenously perturbed equilibrium. In particular, while all "liberal" recipes are stabilizing the latter, they are counterproductive with the former, and *vice-versa* (Boussard, 2005). Since most economists (and probably, all the most influential of them) are persuaded fluctuations come from exogenous sources while they are endogenous, it is not surprising that policies are misdirected.

d) Especially, it has been contended that national quota were unfair at international level, because they were destabilizing the world residual market. This would be true if the international markets fluctuations were of exogenous origin, as it can be seen on Figure 4: Here, it has been assumed that a socialist minded government imposes a production quota on a domestic market, with a guaranteed price production equating the average domestic consumption level of 1000. But the annual production system of the country is submitted to random shocks, so that actual production is uniformly[14] distributed between 990 and 1010. Each year the deficit or oversupply is bought or sold on a residual foreign market defined by its demand curve : intercept 100, slope -0.5, and its autonomous supply uniformly distributed between 101 and 99. The residual market price is highly volatile, as shown by the continuous line on figure 4. If the quota is removed, and price freely determined by merging the supply and demand of the two markets (the intercept is still 100, but the slope of the demand curve is

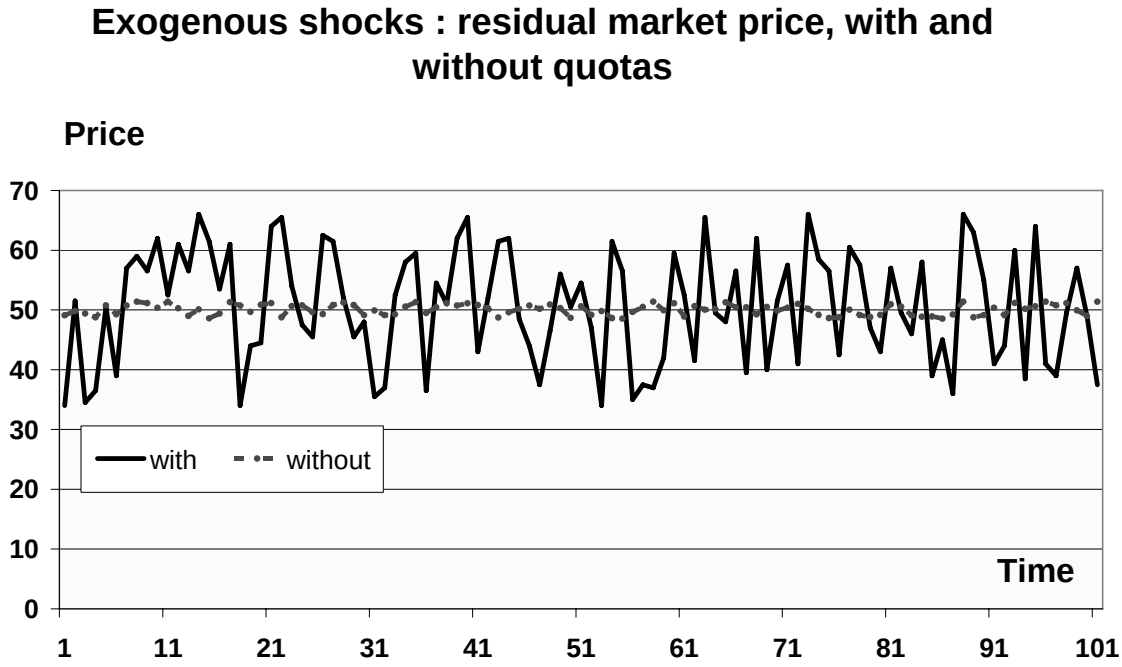
[12] Let us be more precise: at present, subsidies are distributed on a per ha basis, on the ground that it is the only way of securing a decent reward to the family labours occupied on these hectares. Obviously, the Queen of England does not work on her land, so that it might seem useless to give her the same subsidy. However, if she does not work herself, she must hire workers to do the job. Most of the time, the cost of this hired manpower is the same as that of family workers in a small holding. Thus, if the subsidy is suppressed, the Queen will just have to stop farming, firing tenants and letting land going back to wilderness, or selling the land to present workers, the situation of whom will be unchanged. No gains will have be made, nor in efficiency nor in equity (since the Queen will still benefit of the price of the land sold). On the contrary, a progressive income tax will obviously strike the Queen's more than tenant incomes, which is what is sought for equity reasons.

[13] Here, we refer to the mathematical theory of chaos – a special case of dynamic differential equations solutions, with no periodicity, and no ultimate fixed limit when time growth to infinity.

[14] Of course, a uniform distribution is an heroic assumption, made here for simplicity. Many other distributions have been tried as well, with the same kind of results.

now 1/22), the resulting price is shown on the dotted line on figure 4 : clearly, the "without quota" curve is much more stable than the other one.

Figure 4



The results displayed in the case "with endogenous fluctuations" (figure 5) are quite different. Here, although the supply and demand on the two markets are similar (the scale is different), the fluctuations are generated by a risk driven chaotic cobweb[15] (Boussard, 1996). In this case, the series "without quota" fluctuates much more than the series "with quota". Thus, in this context the imposition of a quota, far from increasing price volatility, is

[15] Specifically, the series "without quota" is engendered by a set of four recursive equations :

$p_t = \alpha\, q_t + \beta$: *Demand*

$\hat{p}_t - 2\,A\,\hat{\sigma}_p^2\;\; q_t = a\, q_t + b$: *Supply*

$\hat{p}_t = \tilde{p}$: *Expectation mean*

$\hat{\sigma}_p^2 = (\tilde{p} - p_t)^2$: *Expectation variance*

here, p_t and q_t are actual price and quantity at time t. $\hat{p}_t$ and $\hat{\sigma}_t^2$ are average and variance price expectations at time t. α, β, a, b are " technical " coefficients. $\tilde{p}$ is a constant. A is a " risk aversion coefficient ". Thus, producers consider the average price as a constant. Only the expected variance of price is subject to change from period to period (modifying this expectation scheme, and replacing $\tilde{p}$ by some sort of moving average is easy, and do not change results significantly). Producers maximize the certainty equivalent of their incomes, which, after transformation, yields the supply equation.

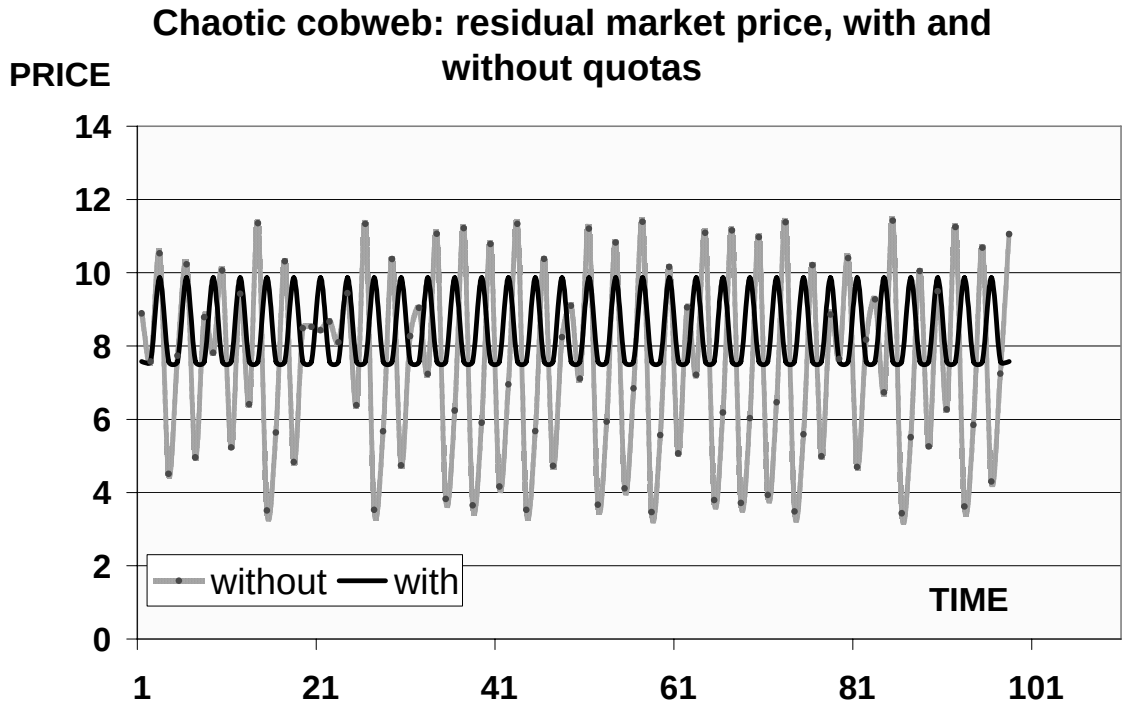
In the "with quota" case, the scheme is the same, except that the "under quota" quantity is produced for any $\hat{p}_t$.

stabilising simply because it guarantees at least a minimal production, preventing low supply/high price situations[16],.

Again, the above example is only illustrative. The source of agricultural price fluctuation is *both* endogenous and exogenous, which does not simplify the stabilisation problem.

Yet, the above discussion shows at least the importance of making a distinction between the two, and of designing policies in accordance.

Figure 5



Can pillar 1 be independent of pillar 2 ?

There exist also large contradictions between pillar 1 and pillar 2. For instance, it is absurd to develop bio-fuels (which, for being produced in significant quantity, would require an enormous surface of land), while, at the same time, encouraging "bio" and extensive farming (which, also, require more land than normal farming to produce a given quantity of output) … This is one among many examples of such contradictions. Now, a prudent supply management policy would certainly provide the possibility of getting almost any wished environmental setting.

The example of milk quotas in France gives some clue in that respect. When it was established, many economists were critical of one of the French law provisions regarding quota mobility. According to this provision, quotas were mobile (they can be transferred from one farmer to another) only within certain geographical zones. In the eyes of a standard production economist, that was strange, because, for achieving the minimum cost, it would have been normal to let a quota market choose the best production location. Certainly, the reasoning was correct in terms of minimal milk cost. At the same time, it was justified for

[16] as a consequence, insofar as the world sugar market is driven by such a kind of fluctuations, it will be even more volatile in the next few years, when the EC sugar quotas will have completely been removed.

environmental reasons: without such a regulation, all milk production would have disappeared from mountainous areas, with large adverse effects on landscapes and erosion[17]. Thus, the regional allocation of milk quotas was a simple and efficient way of securing environmental friendly production techniques, at the cost of a definite production cost increment.

An alternative would have been to pay an additional fee for mountain region farmers to raise milk cattle. Assuming an ideal fee level computation, just compensating mountain farmers for their natural disadvantages, the overall result would have been exactly the same: cattle would have been raised in the Alps, at a certain cost for taxpayers. But the computation of the fee would have caused sever problems. Sometime, it would have been too much, sometime too low. In addition, the fees would have to be adjusted each year to cope with changing input prices. With quota regulations, the problem is self solved.

Again, this is but an example. Many other could be found. The core of the thing is that it is not theoretically possible to completely dissociate commodity and environmental decisions. Then, why not taking notice of it, and acting accordingly?

Concluding remarks

Thus, despite the efforts to bring the CAP – especially pillar 1 – meeting the standards of economic rationality, one has to be afraid that it is heading right down in the opposite direction. There is not the least rationality in decoupled payments (the more as the reality of decoupling remains to be demonstrated, see Berthelot, 2004, Grey , 2006, Donogue and Whitacker, 2006, and many others). Abandoning all ideas of market management is both strange and dangerous while the malfunctioning of markets is precisely the reason for installing any agricultural policy.

The recent evolution of the world markets, with depleted security stocks and soaring agricultural prices could very well make this judgement obviously relevant. Contrary to a common creed, the present shortage of grains (in summer 2007) is not due to the Australian drought, and probably not (or not yet!) to the bio-fuel production. It is the consequence of many market transmitted messages, indicating for several years that agricultural production was too large. World farmers received these messages well, and acted accordingly by reducing supply, although probably too late, and too much…Now, markets will transmit a new message, along which production is too low. One may expect it will increase too much in the next few years, resulting in depleted prices, farmers bankruptcy, and call for farm income support. In the meantime, it is also to be expected that a number of poor peoples in the third world will die from hunger. Indeed, after all, a large famine induced death toll is the most natural way of equating supply and demand on food markets when supply is low (this is what happens with natural animal populations, and also what Robert Malthus considered as the normal course of the economic system).

This is not a rejoicing perspective, no more for farmers than for ordinary consumers… A possible way out is a careful management of agricultural (as well as bio-fuel) markets, through price and supply control on both sides. It could be future of the CAP pillar 1 if the EC wants to keep control of events. If not, especially if EC continue its ideological retreat far

[17] As a matter of fact, this regulation resulted also in large transportations by trucks between excess and deficit production regions – certainly not an environmental blessing! But this is another story! .

from reality, it is to be expected that other institutions – perhaps nations, perhaps international bodies – will seize the relay.

In particular, nowadays, contrary to the situation which prevailed before the Second World War, the rise in urbanisation makes impossible any direct contacts between farmers and final consumers. Food industry stands as a necessary intermediate body. Through vertical integration contracts, it could very well play the role of a market regulator, thus privately replacing all forms of State intervention. Of course, such a new institutional setting would only be workable if food industry firms benefit from large monopoly rents. But in the absence of government intervention, these rents are the more easily obtained and kept as, because they require transportation, the corresponding processes stand (at least potentially) as natural monopolies. It is not sure the consumer (or even the tax payer) would really benefit from such a situation.

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Figure 1

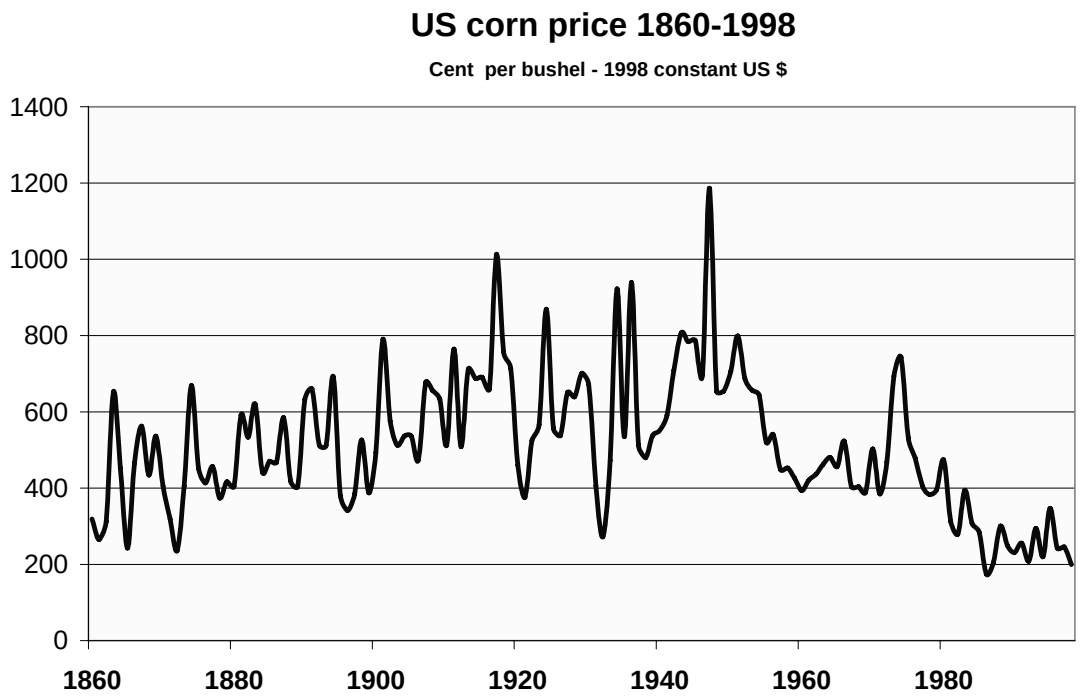


Figure 2 : Non optimal equilibrium with risk

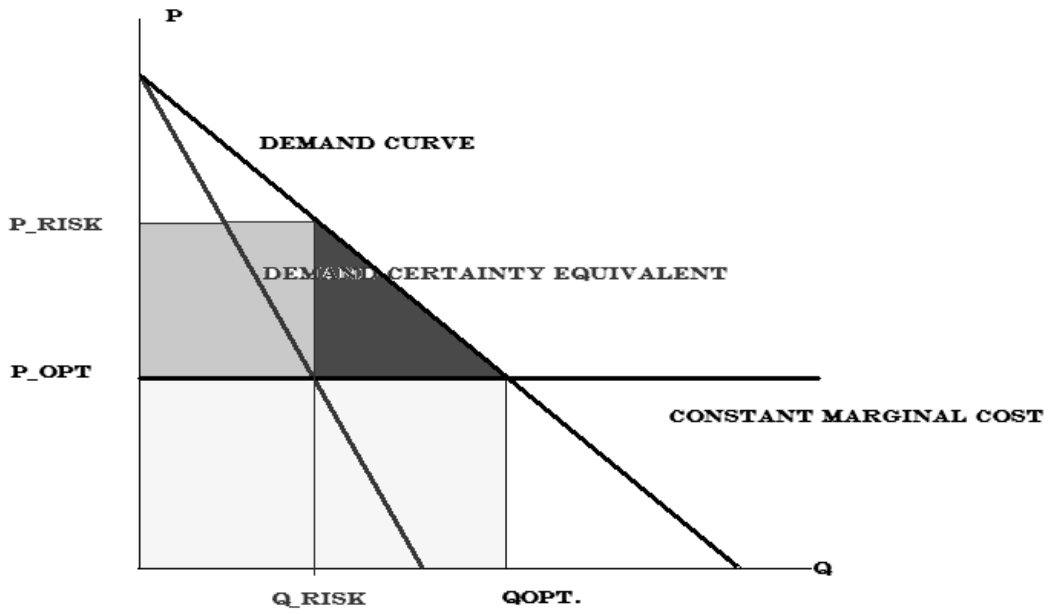


Figure 3 : no equilibrium with guaranteed price

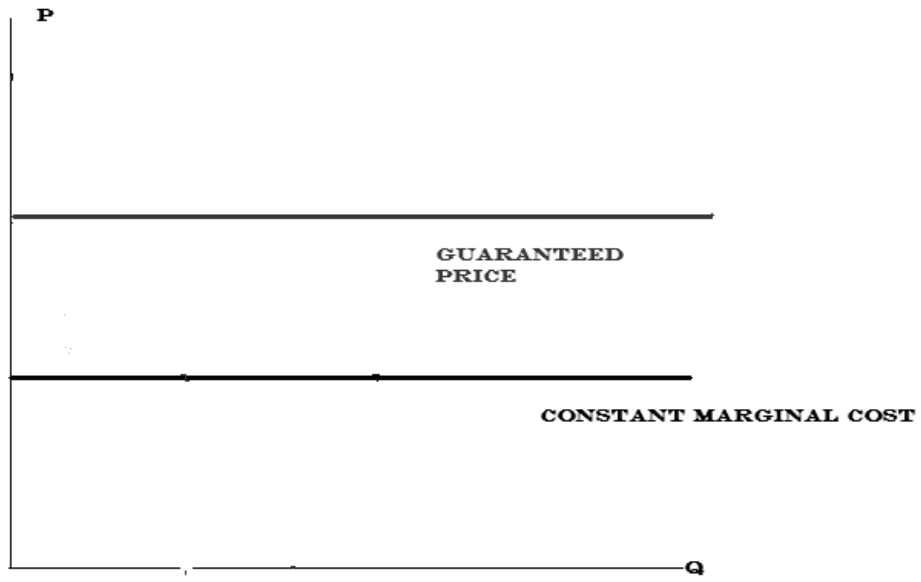


Figure 4

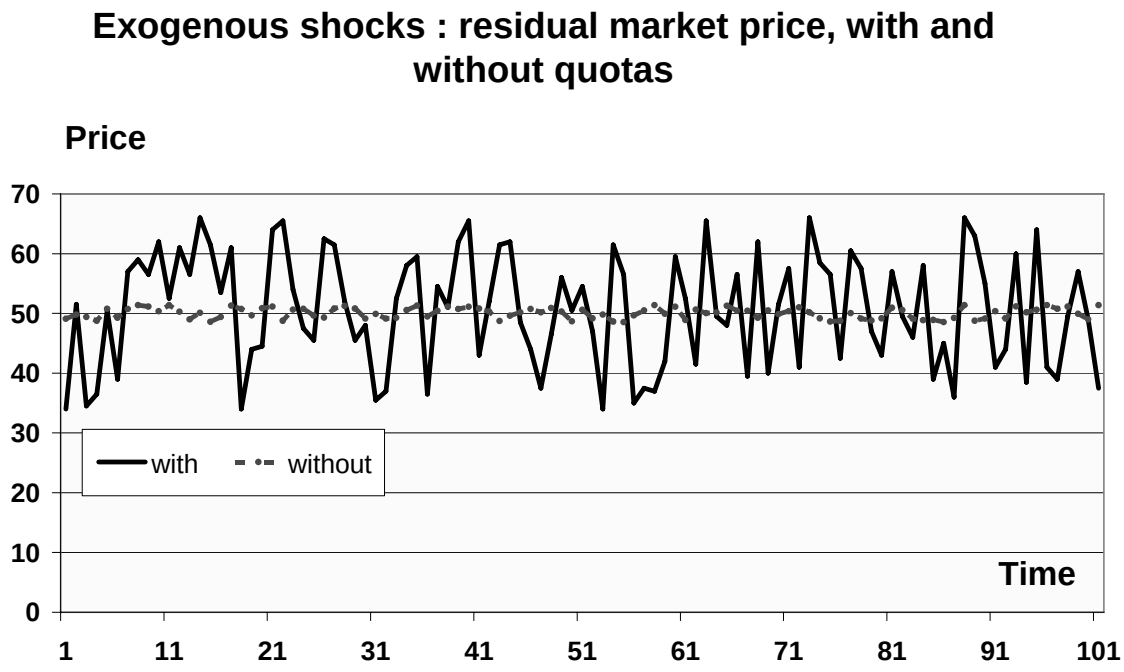
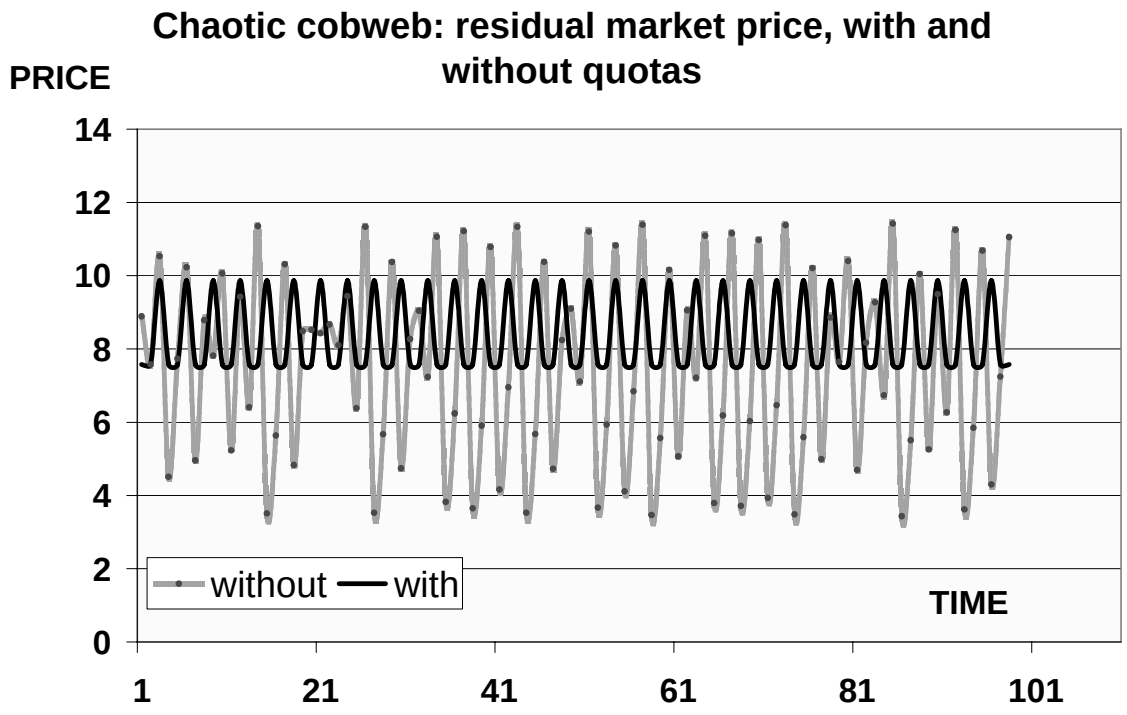


Figure 5


Chaotic cobweb: residual market price, with and without quotas
PRICE
14
12
10
8
6
4
2
0
1
21
41
61
81
101
TIME
without
with