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**THE IMPORTANCE OF OBTAINING A MORE BALANCED
RELATIONSHIP BETWEEN THE LONG AND SHORT FOOD
CHAIN IN THE WORLDWIDE MARKET FOR FARM AND
FOOD PRODUCE.**

**A CONTRIBUTION TO THE DEBATE ON THE
CAPABILITIES OF THE SHORT CHAIN.**

Maria Paola Sini*

***Department of Economics and Woody Plant Ecosystems Sassari - (ITALY)**



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The importance of obtaining a more balanced relationship between the long and short food chain in the worldwide market for farm and food produce. A contribution to the debate on the capabilities of the short chain.

Maria Paola Sini

Department of Economics and Woody Plant Ecosystems Sassari - (ITALY)

Abstract- This paper is intended as an approach to the complex matter of the co-existence of long and short chains. It introduces a stimulus to further study these questions more thoroughly, which current market situations lead us to believe will be an interesting field, and one well worthy of consideration. The potentials and limits of short chain efficiency are analyzed in different contexts, in order to help identify its correct collocation in the search for the best combination of the different ways by which products can be released on the markets, with specific reference to the coexistence of the short and long chain. On this regard, a brief examination is also made of the effects of growing wholesaler power and the possibilities of a relevant control.

Amongst other aspects, the paper highlights the fact that the relationship between short and long chain need not always be one of conflict, and refers particularly to the scope of agricultural-industrial districts.

Context analysis, and specifically SWOT analysis, has been used to debate two different contexts. Many different situations have been examined and summarized, and amassed into two large context groups: developed and underdeveloped countries. The connections between short chain, self-centred development and protectionism are considered. The need is highlighted, and difficulty evaluated, of construction suitable models simulating alternative agricultural-food market function both on a local and global scale, also with reference to region and international trade growth models based on heterodox rather than orthodox development theories. This involves the need to identify emblematic indicators that are able to provide a summary expression of data and information to be included in these models in order to active them. As such, as set of indicators of the short chain juxtaposed to the long chain, suitable to assessing the social and economic, as well as environmental impacts, is proposed, and its validity discussed.

The results of the analyses performed contribute towards evaluating and choosing the most appropriate options for the release of the product, for the different types of agricultural companies in different settings.

Keywords- Market, Short chain, Globalisation

I. INTRODUCTION

This study introduces the complex matter of the co-existence of long and short chains. It is a simple glance at some of the clearest aspects, and a preliminary analysis with the task of stimulating more comprehensive research, which current market situations lead us to believe will be an interesting field, well worthy of

consideration. It does, however, require greater availability of reliable data to allow for analyses and assessments not referring only to quality. This demands the identification and use of quantity-type indicators for the creation of a range of alternative simulation models on global and local food market scale. The study performed proposes analysing the advantages and weaknesses of the long and short chain intended in all its forms (farmers' markets, direct farm sales, *agritourism*, box schemes) in various different settings and environments. The ultimate aim is to help identify a better combination in the set-up of outlet methods into the agricultural-food markets, with specific reference to the coexistence of long and short chain.

II. MATERIALS AND METHODS

Context analysis, and specifically SWOT analysis, has been used to debate two different contexts. Many different situations have been examined and summarized, and amassed into two large context groups: developed and underdeveloped countries.

The connections between short chain, self-centred development and protectionism are considered. The need is highlighted, and difficulty evaluated, of construction suitable models simulating alternative agricultural-food market function both on a local and global scale, also with reference to region and international trade growth models based on heterodox rather than orthodox development theories. This involves the need to identify emblematic indicators that are able to provide a summary expression of data and information to be included in these models in order to active them. As such, as set of indicators of the short chain juxtaposed to the long chain, suitable to assessing the social and economic, as well as environmental impacts, is identified, and its validity discussed.

III. AN OVERVIEW OF THE PROBLEMS

In the current difficult, controversial economic times, in recent years marked by the reduction of stocks and increase in basic food products worldwide and both consumer demand and supply of agricultural production

are experiencing a negative climate, we look to various different types of solution to provide an answer improving the current state of affairs.

The long-standing debate on the opportunities offered up by the so-called 'short chain' or 'short circuit', thus takes on current relevance. This method of marketing constitutes an alternative to the 'long chain', when linked "to the 'logisticisation' and globalization of flows" [1].

The banality of transport costs together with the speed at which information circulates and the growing logistics organisation have resulted in a globalisation of trade flows.

This also takes place for food products, much of which are marketed through 'long circuits' involving a breakdown and delocalisation of the individual production activities, various commercial intermediaries and lengthy travel. We find products from all different countries available on the same market at the same time. At times we cannot even completely control origin, as the areas of farm production are entirely independent of those of consumption and product transformation. This type of chain, first considered to be at maximum efficiency at least in 'financial' or 'merchant' terms, has recently been criticised from an overall economic viewpoint that includes social and environmental aspects.

The evolutionary dynamics of food retail trade have led to a progressive concentration of the distribution chains, due to growing scale economies and the presence of endogenous sunk costs [2], which determine the formation of a 'natural' oligopoly [3]

The affirmation of wholesale and its oligopolistic structure imply important consequences in terms of economic efficiency and social wellbeing. We need simply consider the breadth that the famous Harberger triangle [4] can take on, representing the loss of economic efficiency caused by monopolistic power or even, in this case, by oligopolistic power. What is certain is that, rather than in terms of pure economic efficiency loss, we need to assess the effects of the wholesale market power, both oligopolistic and oligopsonistic, on the social wellbeing of consumers and producers.

With reference to the positive, or apparently positive effects on consumers, we can state that, in contrast with the normal effects of an oligopolistic market structure, wholesale distribution has not yet shown a trend to raise prices; on the contrary, it tends to have a retail price-controlling effect. Furthermore, this task is inherent to the managerial structure of wholesale distribution, based on the sale of high product volumes with profit margins that, even if overall, are high, are relatively low in terms of product unit [5], [6]. However, above all the limitation of retail prices of food products is due to the contractual strength of the major sales chains, which allows them to reduce production prices of agricultural produce to a minimum, at the time of their purchase from the business.

The negative effects of wholesale power therefore occur more in terms of its effect on the initial producers than on end consumers. The prices imposed on agricultural producers are generally rather disadvantageous, to the point where, in some cases, production is discouraged and, in any case, the objective of striving for excellent quality is depressed. We must also consider that the major sales chains determine a delayed, incomplete and, above all, asymmetrical transmission to consumption of price changes at production [7]. This transmission – due to the stated contractual unbalance with the agricultural counterparty – is far more sensitive (and complete) in relation to price increases (and relevant margins) and far less at their reduction, as widely shown by a great many studies.

With regards to negative spin-off of wholesale power on producer wellbeing, it has been shown [8, 9, 10, 11] that this distorts farmers' production decisions and discourages investments. Hence the effects of agricultural policies encouraging production or investment are in vain when in assessing their implementation, no account is taken of being faced with an imperfectly competitive market [12], with a varying level of market power. Marketing companies with even relatively modest market power can capture large slices of the benefits from policies focussed on farmers [7]. In the same way, the benefits of a translation of the retail demand curve, brought about, for example, by a promotion of the consumption of agricultural products, are partly increasingly captured by the commercial sector, thereby preventing farmers from investing in programmes aimed at increasing both production and sales. This can have important spin-offs on policies for liberalising international trade too, under the scope of strategies aimed at encouraging farming in developing countries. On this, the analysis carried out by Sexton et al. [10] shows, for example, that even a limited level of market power, when exercised on several stages of the distribution chain, allows commercial businesses to capture approximately half the benefits deriving from the liberalisation of international trade.

As can be seen, wholesale enjoys undisputed, growing market power. This is expressed in significant positive and negative effects on consumers and producers. We can only ask ourselves if the market evolution, with the concentration processes still underway, will lead the system towards a prevalence of one or the other, even if on the basis of that discussed thus far, it would appear most likely that, for lack of corrective interventions, the social costs of concentrated distribution will exceed the benefits (apart from other aspects such as the loss of economic efficiency, which may be disputed).

We wonder if it will be possible to control the effects of these dynamics through public regulation (in terms of individual states or supranational and global), considering that wholesale, by virtue of its contractual power, represents an authority [6] and, as such, plays a social

role involving voluntary or compulsory (assigned by government) responsibility.

A control of the behaviour of wholesale, if carried out using regulatory tools, is problematic and particularly on a supranational level, requires careful analysis and a significant political commitment.

With a view to attaining a re-balance, however, one simple measure that could be easily implemented both on a local and global scale, may be that of facilitating the creation of alternative marketing circuits (short chain), acting, without altering natural market dynamics, or not so much artificially encouraging the birth, in so much as removing any obstacles to their spontaneous development.

In competition with wholesale, the small businesses of the short chain may be less weak if able to identify new forms of managerial efficiency, focussed on flexible specialisation [13], in synergy with the enhancement of the territory and quality excellence of certain products.

IV. RESULTS

A SWOT analysis has been carried out to classify the endogenous strengths and weaknesses of the short chain and the exogenous elements that take the form of opportunities encouraging, or as risks/threats hindering the positive affirmation of this commercial formula. The analysis was carried out with reference to two difference contexts: developed and underdeveloped countries, in which the different situations examined have been grouped. The results obtained provide the basis for the reasoning on the matters to be discussed over the coming paragraphs.

A. The debated advantages and limits of the short chain: the 'economic place' of efficiency

The advantages of the short chain [14], [15] mainly comprise the sustainability of this method of sale from the various viewpoints:

- economic: lower prices for purchasers and higher profits for producers,
- environmental: reduction in energy consumption and pollution connected with transport and refrigeration storage of so-called 'zero kilometre' supply
- and social: direct consumer control of price and quality, fresher goods and healthier products, relationship of trust and exchange of information between producers and consumers, induced circuits and cumulative circuits of rural development in marginal areas.

These advantages are not limited to a mere reduction in consumer prices, and to a more satisfying sales price for producers, which, given the present crisis, could alone be a determining factor, but also to the way in which the demand is set up, with a search for typical, or in any case local, products, to which a series of merits is attributed,

that add value to the goods themselves, as shown by studies on these matters concerning willingness to pay [16]. These motivations for consumption that relate to a food's 'cultural worth', relate to the medium-high income band, who are willing to pay premium prices for local products, in the same way as a reduced sales price can, instead, provide the prevailing motivation for lower incomes. Furthermore, motivations both for consumption by private individuals and for public authorities to encourage zero kilometre supply, are linked to environmental sustainability.

As concerns environmental sustainability, analyzed specifically with regards to food mile studies [17], there is a critical scientific thread concerning the advantages of zero kilometre supply (see further on, paragraph E).

With regards to social and economic sustainability, despite the fact that locally, prices of products exchanged through a short chain are not always lower to purchasers than those offered by larger sales chains, which have the advantage of working with significant scale economy in the long chain, and that in areas with low demographic density, there is too little demand [18], the fact remains that consumers can thus directly control price and quality, their human relationship with the producers, also allowing agricultural workers to make more independent production choices [19], with consequent moral satisfaction. Furthermore, the short chain fully acknowledges the value of human and social capital, and of local, natural resources, thereby potentially leading to endogenous development both in marginal rural areas of developed countries, and in underdeveloped countries, where it can more efficiently oppose the phenomena of progressive impoverishing, both of natural and human resources, linked to the massive introduction of external production models [20, 21] for intensive productions for export.

The short chain, furthermore, is by far the best solution to all problems [22], and in certain contexts, where it fails to find its natural setting or 'economic place', it then becomes less efficient than the long chain. Generally speaking, it is particularly well suited to solving the problems of smaller, multipurpose farms, offering niche products (local, typical and/or organic). It would appear, on the other hand, less well suited to all situations dominated by medium and large enterprises, with the creation of economic and ecological type scale economies, where company supply is specialised and constitutes a consistent critical mass of product that can more easily be released onto a wider market than merely local, and consequently in types of companies where an efficient use of the entrepreneur's time and work makes it difficult for him to carry out a variety of tasks that would include the direct marketing of company produce. Here, a long chain may be to greater advantage. Furthermore, direct sales are the perfect for products ready for consumption [19], and not for products to be transformed, at least with reference to the organization of advanced

societies' consumptions. Whilst in underdeveloped countries, the short chain would appear to be most suitable when it also creates local circuits for the sale of raw products, such as basic cereals like wheat, which can here be transformed directly by the consumers.

B. Spread of the short and long chain and Level of market liberalisation

In evaluating all this, we must state that the potential of the short chain must not be overestimated, as it currently plays a limited role in developed country trade, and in underdeveloped countries, we see an increasing market penetration by MR. However, the short chain can constitute a strategic tool to be offset or associated with different outlet alternatives promoted by globalisation. In DCs, the promotion of self-supply circuits, contrasting the potentially socially destabilising effects [21] of the long chain, when this identifies with the presence of major companies with oligopolistic and oligopsonistic power it may provide a tool granting a partial 'de-linking' [23] from international trade and relations based on asymmetrical contractual strength¹.

Moreover, the 'neoprotectionist' measure, considered too strong, of the limitation or prohibition for export adopted by some countries to deal with speculation on food products in relation to the financial crisis of recent years (and in particular we refer to countries such as Vietnam, India and Thailand, producers and consumers of rice), shows how promoting self-supply circuits is still relevant today in specific situations, despite the fact that it must always be combined with the activation of profitable trade circuits.

Again with regard developed countries, the short chain results in a release of companies or relatively poor areas from competition with stronger areas and companies, bringing the consumer to the product rather than vice versa, by optimising links between product and territory.

¹A greater development of the short chain presupposes the presence of self-supply circuits with a potential reduction of international trade that can, absurdly, not always be advantageous in situations of unbalanced contractual strength. This does not mean upholding the theory of the 'dependentistas', overcome by more complex overall market visions, nor failing to recognise the claimed benefits of free trade, but rather considering situations where such benefits are not seen. This can occur in the exchanges between strong exporting countries and countries that mainly import [24], between richer, more developed countries and poorer, less developed countries, between countries with different institutional and social frames, where situations far from perfect competition of businesses are created with different contractual strength, which can alter the reasons for the trade and cause (for the weaker country) the mutual benefit of the exchange to fail, even in conditions of different advantages of cost compared of the products exchanged by the countries. For example, estimates made on the impact envisaged by a 'plausible' scenario of the Doha Round envisage 'benefits deriving from free trade that are far higher in developed countries than in developing countries'. Some estimates even show that for some of these latter countries, 'loss is forecast', even if it must be specified that there is 'significant divergence in the estimated results, not only between models but also in simulations of the same model made with the database of reference of different years' [25].

On the other hand, we must also highlight the opposite, namely the fact that an indiscriminate practise of the short chain can result in significant social and economic impacts, particularly when these combine too much with the stated protectionist measures, limiting free trade on the international market. More specifically, an accentuated predilection for the short chain by consumers in wealthy countries² can seriously damage exporting developing countries of some agricultural food products, on whose proceeds the survival of entire rural populations depends³. This is, in any case, true, despite the continued validity of the above (see note 1) on the elimination for the poorer farmers of part of the advantages deriving from free trade, due to the share absorbed by commercial intermediation. We therefore need to analyse and assess prudently, on a case-by-case basis, what can occur in different contexts and situations, in order to assess the dramatic trade-off between environmental sustainability (with reference to the reduction of food miles) or social-economic (with reference to the safeguarding of income in developing countries) and the development of rural areas in importing or exporting countries⁴. One choice between the development of the rural areas of importing countries, with increased local productions [27,28,29,30, 31 and others], or in exporting countries, with the increase of goods transported by international trade, may be false, when due consideration is not taken of the unsuitability of food miles as an indicator of overall environmental impact generated by food [17 and others]⁵, as well as the obstacles that overlay, particularly in developing countries, in the creation of virtuous circuits linked to export⁶, or that can be generated alternatively by an increase in domestic trade.

Only an ideal combination of products exchanged on the international market (when possible, exploiting the compared cost benefit) and products obtained and consumed locally, withholding the new wealth produced within rural areas (when able to multiply investments and therefore employment and income) can allow the rural economies of both countries to develop. This is why we need to remove the commercial mechanisms generating said obstacles to the positive effects.

It is by no coincidence that when talking, for example, about fair trade procedures, still a market niche despite world growth, the problem of assessing the real benefits

² Consider the 'localvore' movement or the successful slogan 'buy fresh, buy local' linked to an ideology concerning environmental, health and/or support aspects to local development.

³ On this, Muller [26] speaks of the 'moral duty' of English consumers to buy strawberries imported from Africa at Christmas, rather than local products.

⁴ See next paragraph on economic impact indicators.

⁵ See next paragraph on environmental impact indicators.

⁶ To produce for export does not always result in advantages for developing countries. In some cases, an agriculture that is mainly focussed on export can increase food insecurity, trapping small farmers in a debt cycle and pushing them away from the land [32]. It all depends on the way in which sale take place and the type of contractual relations.

of export for developing countries do not exist: the advantage is clear. Neither can the trade-off of exports and local circuits be seen as a dilemma. In actual fact, we can see that some joint buying groups – striving for the mutual benefit of consumers and small producers – support both the short chain within a country and the import from developing countries, when this is carried out through fair trade circuits. (These latter circuits, furthermore, despite the distance, in some way ‘shorten the chain’, eliminating much commercial intermediation and relevant margins). The behaviour of these buying groups, focussed on identifying alternative food sales chains, do not therefore show clear conflict between these different commercial circuits, both rejecting logics linked to oligopolistic and oligopsonistic market power.

C. Short and long chain, production and outlet opportunities: not necessarily alternatives

Up until now, we have discussed the conflicts between the short and long chain in various contexts. However, they need not always oppose each other in a given context, but on some occasions, the two different production and outlet circuits can actually coexist, as seen in studies performed in Italy on Marshallian industrial districts. This may come as a surprise, given that, generally speaking, the districts, which exalt the links between the product and the unique characteristics of the land of origin, for their very nature are best associated with the short chain, and when we talk of encouraging mechanisms by which to promote the founding of agricultural or rural districts, we are almost always talking about advancing short circuits.

Instead, it is precisely here that dualism is almost cancelled out [33] between the short and long chain and the different types of companies that can benefit from the opportunities offered up by both. Individual companies evaluate viable options, calculated on the most convenient specific size and value chain [34] that affects the choice to delocalize [35]. Medium-sized enterprises particularly benefit from both these opposing production and sales methods, often used simultaneously, where an ‘economic place’ is created, making this an appropriate choice. The production circuit can therefore be delocalized, as is typical of the long chain used to reduce production costs by medium-sized enterprises too, as for large, and, at the same time, sales both *in loco* through a short chain, and externally, through a long chain, but incorporating the advantages of product reputation, typical of the short chain. In this way, a connection is maintained with the territory-district of origin, which in this case, is the ‘historic’ place of knowledge and production tradition, and where the company, organization and production assembly continues to be based, and from where all directives concerning production methods, are imparted (production rules) and product certification supplied, which, even if the final products are obtained through steps carried out in

different areas, comply with quality standards and the typical nature of the district product, of which it bears the name.

This reality, already seen in studies in industrial-manufacturing districts, now also appears in agricultural and food areas. International competition leads to a reduction in production costs through delocalization, which assumes acquiring various inputs, each in the area of least cost, and subsequent assembly of the various steps, above all else, according to the best organization and lowest logistics costs, but at the same time, this competition heads towards an ever-greater appreciation of the so-called positional goods, namely those associated with a different level of quality-related reputation.

The current market trend looks towards increasing commerce of goods defined [36] as ‘decommodified’, i.e. differentiated goods protected by intellectual property rights and/or trademarks, differently from the traditional ‘commodities’. And competition, which is increasingly ‘based on quality (real and/or perceived) rather than on production costs’, becomes positional, and appreciated by companies, as their very nature leads to the formation of undisputable markets that generate income [37]. This income, please note, accentuates asymmetries between developed and undeveloped countries, in the first’s favour, considering that the latter mainly produce commodity goods.

With the simultaneous presence of different branches of production and sales circuits, district companies, therefore attempt to compete on both fronts (reducing costs by delocalization and with product reputation linked to the area of origin), although we can assume that both competitive advantages, although possible, cannot continue long-term. The ‘typical’ product quality, which gives it its reputation, is, of course, at one with local production.

To this end, we should clarify a basic misunderstanding: we need to distinguish long production and sales circuits from those that relate exclusively to product sales. Whilst the first do not well adapt to district traditions, separating the close link that identifies the product to a territorial matrix, the second can happily coexist with short circuits, as differentiated outlet opportunities for goods that can be consumed *in loco* not only by residents, but by tourists too, or alternatively exported from the district area. If referred to sales alone, the two circuits can reciprocally benefit where a high quality product internally and externally blends marketing of both product and territory.

D. The need to construct suitable food market simulation models

In assessing short and long chain coexistence, in terms of market shares due to each, we must also assess the trade-off between a greater or lesser degree of market

liberalisation⁷ underlying this.

This requires the identification and adoption of suitable food market function simulation models and international trade of agricultural produce with the hypothesis of a complete liberalisation and delocalisation of the production of food sold, with the hypothesis of minimum protectionism and greater presence of local commercial circuits of the internal product.

These need opens up a vast field of research that must start from the choice of more general international trade and regional development models⁸, within which specific food market models can be constructed, focussing on the issues at hand⁹.

On this regard, despite considering the general validity of orthodox theory-based regional growth and international trade models (compared cost consideration in the classic Ricardian model and derivations thereof), we have noted greater adherence to the current reality of heterodox models considering circular causation phenomena [39] and agglomeration¹⁰ [40], with cumulative effects tending to increase unbalanced situations, rather than a return to a Walrassian type equilibrium.

The interpretative capacity of the latter would look, in fact, to be greater, particularly with reference to trade between countries or territories with different development situations, in a world market featuring imperfect competition and increasing returns, from mobility of production factors and freedom in business localisation strategies, as well as an increase in the trade of goods that, in the food market too, tend to be identified as 'positional' [41, 37, 36].

In the assessment of the respective level of short and long chain expansion, therefore, cumulative effects must be considered. These can generate vicious or virtuous cycles over time, in centre-periphery relations involving various local territories, with specific reference to the development of rural or agricultural food districts.

Once the models reproducing the function mechanisms of the market on a local and global scale have been built, in order to use them we need concrete data and specific indicators highlighting the impacts of different

alternative function modes. We refer to the assessment of the function methods deriving from the alternative combination of different 'doses' of the short and long chain, aimed at choosing that which is socially most convenient.

E. Some indicators of impact that may potentially be used in simulation models

The following is a discussion of the representation and difficulty of calculating some impact indicators that could be used within models simulating the different coexistences of the short and long chain in different contexts.

For the analysis, an approach was taken to the problem not with reference to the agricultural food sector, but rather to the territorial system. This is a privileged viewpoint from many authors [41, 42, 18] in the analysis of the local food chains, also with reference to product quality. In actual fact, this approach better highlights, in a system logic, the interwoven, partly overlaid effects on environmental, social and economic sustainability, caused by the marketing via the short chain [43].

It must, however, be specified that in this study, the scope of the individual local system is not placed as a single centre of the agricultural food market analysis. Rather, although valuing what occurs within the local systems, the interactions between these on a global market level and the issues related to such interactions are highlighted, the outcome of which may be seen even a long while afterwards.

Measurement of environmental impact

The positive impact of the 'farmers' markets' and, more generally, of the sales methods with short circuits, is almost always mainly considered from an environmental viewpoint, and less frequently with regards the social and economic aspect. More specifically, in a certain sense, and at least in relative terms, its environmental worth is overestimated, and its social and economic aspect underestimated when not linked to the environmental worth.

The public, and not only researchers, are now aware of the widely-covered issue of food miles, or rather the mileage covered by food products on long journeys in the global market through the long chain and the opportunity of a zero kilometre food distribution aimed at reducing not so much the economic cost of transport as, above all, reducing pollution by CO₂.

Far less known, instead, is the debate raised by a scientific thread that has a critical attitude with regards the assessment of the environmental cost that exhausts in considering the advantages of zero kilometre supplies. In actual fact, what must be considered in assessing sustainability is not only the environmental cost of transport, but also the different food production systems and a 'scale ecology'[44], which also considers energy

⁷ Which, in turn, requires complex assessments ridden with problems [38], involving aspects of the positive and normative economics.

⁸ By choosing between the different types of codified models available for both international trade (models that can be grouped under the scope of partial balance models or general balance models, monosector – multicountry or multisector – monocountry, with different variants and different hypotheses of elasticity of supply and demand, crossover effects between sectors, etc.) and for regional development (seen from different hypotheses of balance and unbalance).

⁹ It is a question of articulating, within the stated general models, specific models able to represent the elements brought out of the different agricultural-food market function mechanisms that we wish to assess, with the relevant spin-off on both a local and global scale. Clearly, also the effects on different scale will require the use of differentiated models.

¹⁰ We refer to the formation of 'centres' and 'peripherals', namely the formation of strong regions (and peripheral areas) and districts (a great many specialised clusters).

saving linked to the size of the agricultural and transformation businesses, allowing for an overall consideration of all compared environmental costs of production obtained in different parts of the world¹¹. One consideration worthy of note is that, where production and transport methods are equal, the environmental costs of production of food naturally vary according to product type, hence the same consumer food choices¹² significantly affect this [48]. It is therefore important to consider what food is chosen and not only where it comes from.

Finally, even if it is *more frequent* for a food produced locally (particularly if a seasonal product not obtained by forced greenhouse use) to create less energy waste than imported items, the hypothesis that local food *always* requires less total energy than an imported one is false. Furthermore, recent studies in America and in the UK show that around 80% of emissions linked to food products are generated prior to their leaving the farms.

As such, a great deal of criteria can be proposed to assess the impact of the long and short chain with reference to the entire food production and sale cycle, and only one of these can be expressed as an advantage of the pollution damage avoided and energy savings made by reducing transport [17, 49]. Furthermore, this criterion may also be somewhat limiting, assessing using merely the distance in terms of miles travelled by food products from the field to the sales outlet [17]. In actual fact, we must also consider the means (e.g. by air, sea, land on wheel or rail) and transport efficiency (linked to vehicle dimension and load coefficients), as well as the journeys made by consumers themselves. As such, in some cases, and particularly if we consider consumer travel, the logistical organisation of wholesalers, even if with long circuits, may actually be more efficient in terms of energy consumptions than the short chain [50].

However, on this we can object that in assessing consumer travel we must also consider, in the case of buying direct from a farm for example, the recreational aspect linked to the discovery of food and wine tourism (the wine ways, the oil routes, etc.). Both when dealing with the travel of tourists from afar, looking to explore a territory in full (including typical food produce) and with close-by trips made by consumers moving locally from town to the countryside, the journey serves a dual purpose: that of satisfying a cultural and tourism demand as well as the closely-linked but perhaps secondary need for food. It therefore becomes difficult to isolate and assess the environmental cost of the journey exclusively with reference to food purchase.

¹¹There may be different types of environmental costs with reference to both the natural climatic specifics [45] and to business organisation and dimension. In actual fact, an inverse link has been found between the dimensions of the company and energy saving [44] small companies are less efficient in energy terms, and this is reflected on the end product. Various studies have been carried out on these matters, [46, 47, 48].

¹²For example, the choice of a vegetarian diet.

In short, a set of key indicators that can be used, each of which in turn involves the calculation of a series of underlying indicators and assessments, as can be seen from more in-depth studies on the matter [17] is:

- Comparison of distance covered by long, short and very short (0 km) journeys for different foods moved between different countries (or different regions within a single country) and simultaneous assessment of damage prevented in terms of atmospheric pollution and energy consumption. On this, various studies have been carried out in recent years revealing parameters ready for assessment. In any case, assessment is complex and difficult and must consider many elements.
- Assessment of consumer urban travel to reach shops (supermarket, market or farmers' market) and longer supply journeys directly in rural areas, as well as those of producers (or distributors) for home deliveries. This indicator is even more difficult than the previous, only attaining an approximately result using the partial results of studies performed.
- Assessment of the different energy expenditure of the whole production cycle in different places in different parts of the world, to show compared production energy cost.

These three indicators, when combined, may allow us to assess energy savings attained through import (long circuits) or short chains, by comparing the production energy cost and transport energy cost sustained or avoided. In this case, a short chain impact is seen that can even be negative.

Measurement of economic impact

As mentioned above, there is much talk of environmental costs linked to long circuits, and less of the social and economic costs linked to the oligopolistic aspects, and, above all oligopsonistic aspects of wholesaling, which grow prospectively parallel to the progressive concentration of companies in a situation of growing returns. These costs can to a certain extent be controlled and offset by alternative sales methods that return value to producers and production territories.

We refer to the effects generated by local commercial circuits. More specifically, the latter have a positive effect, increasing the circulation of money in the area where they occur. The importance of this is well seen in the metaphor of the 'leaky bucket', used by various authors and organisations and, in particular, the NEF (New Economics Foundation). This increased cash circulation within a local economy becomes important as, in turn, it can increase investments, employment and income for the local economy.

We must also consider that the promotion of local production-consumption circuits, although able to start of employment and income growth processes in the area where it is introduced, it does pose the problem of the choice of increasing farming income in different regions.

It is not, in fact, a given that such circuits create additional wealth if not accompanied by a simultaneous increase in consumption. Instead, income may be increased in some regions and, at the same time, with equal consumption, there may be a reduction in others, due to the simple movement of wealth created respectively by the reduction of imports and exports between them under the scope of a single state or different countries (see Rich Pirog's opinion in an interview held by DeWeerd [32]).

However, one advantage of the local circuits as compared with exports, may be linked to the fact that the increased wealth created by the first can, where there are no constraints, multiply investments and increase employment as compared with that created by the second, given that the economic subjects (consumers and businesses) would instinctively be more likely, where other conditions are equal, to consume and re-invest income within or near their own territory.

With regards the positive impacts of the short chain in economic terms, these are:

- Positive impacts in terms of re-balancing, measured as the reduction of damages already assessed by studies (or elimination of hypothesised risks), attributable to the growing power of wholesalers, assessed using indicators that are difficult to calculate;
- Positive impacts in growth terms (farmers' income) and development terms (marginal rural areas), the first measured with direct indicators taken from the simple direct collection of data, the second through a more complex set of indicators, that consider the direct and indirect chain effects involving agriculture and other economic sectors.

The positive, re-balancing impacts can be assessed as:

1. Partial re-attribution to farms (particularly in developing countries) of the economic benefits that should have been achieved by policies in their favour and which instead were partially absorbed by the distorted market power (in this case oligopsonistic) of wholesalers. It is not easy to calculate this indicator, but we can use previous studies estimating losses;

2. Advantages from the start-up of internal self supply circuits, particularly in developing countries. These advantages are controversial and difficult to identify and assess;

3. Another criteria for judgement that is controversial and difficult to assess is the reduction of the Harberger's triangle determined by the mark-up of oligopolistic wholesale businesses. In this case, we need to first calculate the breadth of this triangle in market conditions that differ from the perfect competition balance and then its reduction in conditions still distant from the competition, but a little less distant from it (for the most widespread co-presence of different size businesses and market power).

The positive impacts on the increased farmers' and consumers' income can be assessed:

1. Through the simple collection of pricing data at the company doors for farmers supplying the product to the commercial chains (directly or through intermediaries) and price obtained with the various alternative direct sales methods. The price difference to the company for the volume of product distributed or able to be distributed allows for a certain historic evaluation or forecast increase of income and consequently (with equal costs sustained) of the net income of farmers involved in these short chain sales methods.

2. The positive impacts on consumer income can be controversial (products supplied via the short chain do not always cost less), but in any case can be measured directly with the difference in price seen on the market.

The positive impacts on the development of marginal rural areas are difficult to immediately see from the cumulative effects, but can be assessed through direct and indirect indicators representing development:

1. Through an assessment of the 'local multiplier' that measures the number of times a unit of currency, moving hand-to-hand, circulates within an area, through a local economy. A higher number of times means that more money is re-issued into circulation, as stated, thereby increasing investments, employment and income. The more money is re-spent in an area, the more new capital is attracted there. In both cases, it is new money in the hands of the receiver. On this, a study carried out by the NEF in Cornwall provides an interesting example [51]¹³.

2. By increasing investments made by farmers (in terms of number and value);

3. Through an increase of integrated activities with farming, such as tourism, both in-company (multipurpose agricultural companies) and in the territory by optimising food and wine tourism more generally, identifying routes between agricultural producing companies. In any case, through an increase of activities that induce upstream agricultural production (tourism of local produce);

4. Through an increase of activities in turn stemming from agricultural activity both upstream of this (agricultural services and technical means distribution companies) and downstream (small agricultural food transformation industries);

5. Through an increase in the number of businessmen and employees in farming;

6. Through an increase in the number of total businessmen and employees in the area.

These direct indicators referring to increased investments and employment can be measured directly from historic data on previous increases and through consequent calculation of investment and income multiplier for

¹³“Showing the quantity of the positive impact of the short chain “using a leaking bucket analogy to demonstrate that £10 spent on food from a vegetable box scheme is worth £25 to the local economy, whereas £10 spent in a supermarket is worth only £14 to the local area”.

assessments, with differentiated situations hypothesised, forecasting potential increases in the future.

Various studies on the income and investment multiplier have been performed and on the increase of employment linked to local food sales circuits. For example in the region of Iowa by Swenson, in the central region of Puget Sound by Sonntag, in south east Minnesota by Meter and Rosales. All these studies show the advantages of short food circuits for the development of local economies and, consequently, employment.

Other indirect indicators, considerable also as a social effect on the development of marginal rural areas, can be calculated:

2. Through an increase in the number of businessmen and employed youth in the farming sector (reduction in the ageing rate).

2. Through a measurement of the reduction of de population underway in the area prior to implementing projects promoting alternative networks for selling local agricultural food produce;

With regards to the negative impacts of the short chain, we consider that these may above all derive from related protectionist effects, when consumer preference for local produce in wealthy countries precludes developing countries from finding an outlet for certain food products, on whose export they depend.

In any case, we see an increase of the sales of local products in a given area, without an overall increase of consumption within the same area, the increased wealth and employment, under the scope of the territory concerned, is, at least partly, offset on a global level by losses in other territories. This is seen due to the reduction in sales of food products imported from other regions of the same State or from regions of other countries that may refer to areas included in developed or developing countries. In the second case, losses have a more significant impact.

Indicators for the measurement of these negative economic (and social) impacts may be:

1. Calculation of the reduction in sales of food products imported from developing countries and corresponding lost income, less the share of partial absorption of these lost earnings that – if sales had been made – would have been realised, due to the distortion of the oligopsonistic and oligopolistic power of the large multinational sales chains;

2. More difficult calculation of the potential lost multiplier effect that could have been realised from the lost earnings (less the share that would in any case have been lost due to the absorption by the commercial intermediation) in an economy without alternative resources;

3. Calculation, linked to the previous, of the negative chain reaction caused in terms of divestment and progressive impoverishing, which is difficult to assess.

4. Calculation of the reduction of sales of food

products imported from other regions of the same state or other states, with reference to exports of developing countries. Calculation of income and potential lost multiplier effect due to lack of export. In this case, the multiplier effect must be considered as lower than for under-developed countries (given that the latter have few alternative investments, whilst in developed countries it would have been overlaid against the multiplier effects of many other investments, sometimes in a way that is difficult to distinguish) and difficult to assess.

Measurement of social impact

As concerns social impacts, much of these derive indirectly from environmental and economic impacts, which reflect on the farmers', consumers' and society's wellbeing as a whole. These include, in particular:

- positively, the effects of the short chain on rural development with effects linked to the social life of the local population;

- negatively, the devastating effects for the survival of entire communities in developing countries due to the reduction of international trade.

As concerns the positive impacts, the most significant and complex, closely linked to economic aspects, consists of the strengthening of the social cohesion within the community of the area determined by the new network of economic relations set up by the local sales circuits. This social cohesion is particularly important in that, in turn, it encourages an exchange of information and the setting up of further economic exchanges, facilitating transactions (generating economies due to a reduction of transaction costs typical of Marshallian districts).

There are also other positive effects of the short chain, more specifically definable only as psychological-social aspects, although linked to social vivification.

As concerns the proposed impact indicators, for positive effects, these may be some demographic type indicators and other, more complex indicators to be identified *ex-novo* or choose from the many indicators (mainly proxy) recently experimented to measure the consistency of the 'social capital'. The following can be proposed:

1. An index of the reduction of de-population (already specified as indicative of economic development)

2. An index, partly linked to the previous, of the reduction of young emigration

3. An index of the increased presence of young people with higher qualifications (high school and university graduates)

4. An index of closer-knit horizontal relations between social and economic players of the area (number of times exchanges take place between the various network nodes, importance of individual nodes in terms of relations branching, network form)

5. An index, linked to the previous, able to measure the speed at which information is spread

6. An index able to measure the ease of access to credit (and compare with previous situation)

7. An index of the extent of cooperative aggregation (compare with past situation)
8. An index of the reduction in unemployment (mirroring that on the increased employment, already mentioned for economic development)
9. An index able to measure the sense of belonging to the community (assessed from the results of interviews with specific diagnostic questions in that sense).

For the negative effects on developing countries, although not exclusively due to reductions in trade determined by the short chain, the following may be representative:

1. An index of any increase in population malnutrition
3. An index of any reduction in life expectancy
4. Other misc. indicators of poverty, difficult to assess.

We must note that these indicators may be controversial if we consider the equally devastating effects of an exchange that, if based on asymmetrical conditions, tends to systematically impoverish local resources to the damage of the resident population, as has certainly been the case with single-crops for export to the detriment of other food productions for domestic supply (a fact that may be in line with the compared cost benefits of different productions of income were mainly within the grow areas, allowing for the purchase of other goods produced elsewhere at more advantageous terms). As concerns the other mentioned positive effects of the short chain, defined as psychological-social, these are:

- Relations between consumers and producers, and mutual satisfaction of direct dialogue;
- Satisfaction of a greater production independence by producers and professional pride of disclosing the specific quality of one's own product;
- Consumer satisfaction in enjoying both the taste of the local fresh seasonal product (available 24-48 hours after harvest as 0 km), and the cultural and health benefits, as well as being positive for the environment, as attributed to the local product;
- The time and place of purchase as a source of social aggregation and distraction for buyers;
- An optimisation of local rural food and wine and general culture;
- A strengthening of the inter-relations and cultural exchange of town and countryside (particularly linked to agricultural tourism but also to direct sales). All these elements, which are exquisitely social, are difficult to quantify as they concern components of social wellbeing that are intangible and not measured.

V. CONCLUSIONS

The analysis performed is a contribution towards the assessment of alternative opportunities for product results for the different types of agricultural companies in different environments. Amongst other issues, it

highlights the fact that the type of relationship between long and short chain is not always one of conflict, with specific reference to areas constituting agricultural-industrial districts.

To conclude, we can consider the importance of specific studies aiming to identify/assess the environments of greater relevant convenience, those where there may be an overlay and juxtaposition of long and short chain, in order to identify an optimal coexistence in the various contexts, on a local and, overall, global scale, between the two methods of production and release of products onto the agricultural food markets system.

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