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‘Traditional knowledge’ and local development trajectories

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‘Traditional knowledge’ and local development trajectories[*]

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Abstract

The paper discusses the concept of ‘traditional knowledge’: its definition, economic significance and role in shaping regional development trajectories. After outlining a conceptual framework for the analysis of traditional knowledge, the paper examines the changing position of traditional knowledge in two Italian regions that have followed quite different development trajectories since the 1950s: the ‘Sibillini Mountains Region’, which has one of the most complex human landscapes in Europe, and the ‘Marche Region footwear industrial district’, one of the best performing territories in Italy during the decades 1950-2000. The analysis seems to corroborate the hypothesis that the role of traditional knowledge depends on a complex interplay between meta-preferences, relative prices and technologies co-evolving in time.

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Contents

1 Introduction*

'Traditional knowledge' is very frequently evoked in the policy-making process as a 'resource for economic development', both for territories which have gone through, or are entering into, processes of de-industrialisation, and for declining rural territories. Yet there seems to be insufficient theoretical and empirical understanding of how 'traditional knowledge' helps shape regional development trajectories. Traditional knowledge, which is frequently associated with the concept of 'regional identity', is little discussed in economics, even though its importance is evident. This paper builds a preliminary conceptual framework within which to examine this issue.

After setting out (Section 2) a framework for discussion of the phenomenon of 'traditional knowledge', the paper focuses on the knowledge trajectories of two Italian regions in order to gain insights into the changing function over time of 'traditional knowledge' in the economic process (Section 3). The first region considered is the Sibillini Mountains Region, one of the most complex human mountain landscapes in Europe, which went into striking economic decline in the years 1950-2000, losing more than 60% of its population. The second case examined is the 'footwear industrial district' of the Marche Region, a territory with a population of about 140,000 inhabitants, highly specialised in footwear production, and which over the past five decades has achieved one of the highest rates of industrial growth in Italy. Both situated in Central Italy, these two regions have followed development – and knowledge – trajectories that can be deemed 'typical' with regard to various analytical and policy issues.

The paper argues that the economic function of traditional knowledge can be understood only by making historical consideration of the interplay in society among *meta-preferences*, *technologies* and *relative prices*. In the long run – the time span relevant to discussion of regional development – meta-preferences, technologies and relative prices changes – and often markedly so. Moreover, to a certain extent, they co-evolve. Traditional knowledge may consequently find itself performing a role distinctly different from the one that it played in the previous configuration of meta-preferences, technologies and relative prices.

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2 The economics of 'traditional knowledge'

2.1 The concept of traditional knowledge

Here, the term 'knowledge' denotes 'technical knowledge', that is, the set of procedures through which matter-energy and information are transformed into 'goods'. The paper will therefore focus solely on the knowledge required to undertake the goods production process. This is not, of course, the only kind of knowledge on which the economic process is based, but it is the one with regard to which the issue of 'traditional knowledge' seems relevant. Other types of knowledge – those required by transaction processes for example – are not examined.

On observing an intelligent system – a human being or an organisation – one invariably finds that at any point in time it contains a certain amount of knowledge. Intelligent systems are systems in which a 'critical' amount of knowledge is comprised in the system *at any moment in time*. The knowledge in the system is 'critical' in the sense that it ought to suffice for the production processes required to produce the commodities needed to feed into the system itself, either directly (self-production) or indirectly (through exchange of the commodity produced or the resources commanded).[1]

Knowledge about how to organise matter-energy and information can be interpreted as a set of 'technical norms': that is, as a set of abstract descriptions of the actions with which to combine matter-energy and information in order to obtain a different kind – at a higher level of organisation – of matter-energy and information. Needed to implement these technical norms are individuals (mind-body units) and, normally, tools-equipments and resources – the tools-equipments (or 'fund elements') must be functional to that specific transformation.[2]

The knowledge (K) required to produce a commodity x can therefore be represented as a string of 'technical norms': $[k_1, k_2, \ldots, k_n]$. Each production process can be divided into a certain number (n) of technical norms, that is, a certain number of abstract descriptions of production actions. The concept of 'technical norm' differs from that of 'routine' (Nelson and Winter, 1982) in

[1] I hasten to add that individuals are highly heterogeneous units with respect to the amount of knowledge they command and their learning ability (Simon, 1976, 1978). This fact obliges social scientists to examine local society in order to reconstruct the structure of the population empirically, as suggested by Veblen (1898) and practised in the institutionalist scientific paradigm (Hamilton, 1999).

[2] The conception of the production process on which this analysis is based is that proposed by Georgescu-Roegen (1971).

that it explicitly refers to a cognitive process which controls actions (see Parsons and Shills, 1959).

The division of labour implies that it is not necessary in practice for each individual involved in the production of a commodity to possess all the knowledge required to produce it. It is sufficient that each worker knows the technical norm or string of technical norms that he is required to implement according to the prevailing division of labour. Knowledge about how to produce a given commodity is therefore distributed among a number of individuals. However, individuals may possess a quantity of knowledge which far exceeds the amount that they apply in the production process. As will be discussed below, a distinction must be drawn between the technical knowledge that individuals possess and the technical knowledge that they are required to put into use.

If the notion of knowledge is conceptualized in this way, the concept of 'traditional knowledge' follows straightforwardly. The question of 'traditional knowledge' arises when the 'age' of each technical norm is considered: that is, when the focus is on *how long* at the time considered given technical norms have been used by an individual or in a region. (The possibility of emigration/migration obliges a distinction between these two perspectives: that of the region and that of individuals.)

The knowledge required to produce a commodity usually comprises technical norms of different 'vintages'. In other words, the production takes place on the basis of technical norms whose use began at different points in the past. 'Traditional knowledge' consists of those technical norms that are 'older' or 'old enough' when compared with the other technical norms in use.

If knowledge consists of technical norms of different 'vintages', the issue of the amount of traditional knowledge can be raised in regard to any region. In a given region there may be commodities which are produced on the basis of technical norms whose use began some decades earlier. On the other hand, it may happen that all the technical norms used in a given production process are relatively 'new'. The balance between 'old' and 'new' technical norms may be different for each good produced in the region. It therefore seems necessary to reconstruct empirically, region by region, the nature of the knowledge on which the production process is based.[3]

[3] A regional perspective on technologies and technological trajectories, which amounts to a scientific research programme encompassing the issue of the role of traditional knowledge, has been proposed, for example, by Hilpert (1991, 2003) and Lundvall (1992).

2.2 Traditional knowledge and technological progress

Technological progress does not necessarily entail that all the technical norms applied in the production of a commodity change simultaneously. On the contrary, when technological progress is expressed in terms of technical norms, it appears self-evident that it normally takes the form of a *partial* substitution of the technical norms applied. Consequently, the knowledge about the production process to be found in a region is almost invariably made up of 'different vintages' of technical norms. The use of the adjective 'traditional' signifies that at any point in time there are *some vintages* of technical norms which may be characterised as 'traditional'. It does not mean that all the vintages are 'traditional'. As a consequence, the stock of knowledge used in the economic process should be conceptualised as a 'complex object' with a highly specific structure which evolves over time.

In principle, technological progress takes place at the following three fundamental levels: those of (a) technical norms; (b) tools-equipments; (c) resources.[4] A change at one of these levels does not *logically* engender a change at the other two levels. There are cases in which a *new* tool is required to implement a new set of technical norms or to use new resources. Yet there are cases in which the same technical norms can be applied with a different tool and/or a different type of resource. The different ways in which technological progress manifests itself explain why traditional norms are still widely used in many sectors: the technological trajectory may be such that radical changes in tools-equipments and resources can be implemented without altering technical norms, or doing so only partially.

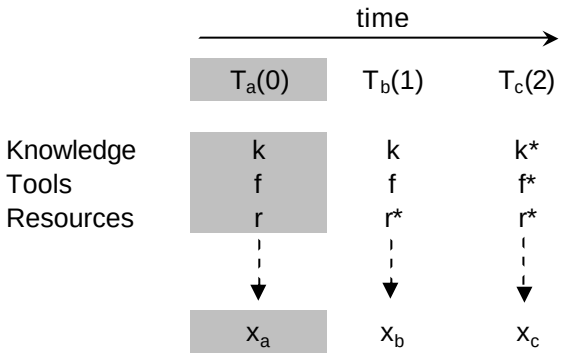
When one looks at production process technology in terms of technical norms – or knowledge – it appears evident that traditional knowledge is by definition not erased by technological progress. Indeed, technological progress may make such knowledge more important in so far as commodities with an high content of embedded traditional knowledge are up-graded in terms of functionality or are made less expensive by technological progress.

There are many commodities which cannot be produced without traditional knowledge. Consequently, their technological trajectory is such that some technical norms are still in use because it has not yet been possible to replace them. This is the case of commodities like leather shoes or cheese (to cite examples relevant to the two regions examined later in the paper) which can be made using rather old technical norms – notwithstanding the notable technological progress in their production.

[4] Here the term 'resources' refers to the type (and quantity) of matter-energy and information transformed in the production process (see Georgescu -Roegen, 1971).

Figure 1 illustrates an abstract case of technological trajectory. Commodity *x* has been produced over a given time-span with three technologies introduced one after the other: *a, b* and *c*. This sequence is a 'technological trajectory' [$T_x(t)$]. Illustrated by Figure 1 is one of the possible technological trajectories that generates unused traditional knowledge in the system. Moving from technology T_a to technology T_b changes only the type of resources (from r to r*). But a further shift to technology T_c implies a change of tools (from f to f*) and of technical norms (from k to k*). The assumption in the example that $T_a(0)$ is the 'traditional technology', and therefore that 'k' is the traditional knowledge, entails that introducing technology T_c renders traditional knowledge obsolete and forces it out of the factory or workshop or cottage. The question of the (potential) use of now unused traditional knowledge arises.

Figure 1 – A trajectory of technological progress



2.3 Levels of description of regions in terms of traditional knowledge

If, when technology T_c is in use, one observes the technology trajectory of commodity x as illustrated by Figure 1, the question arises as to whether there is *somewhere* a 'memory' of the technical norms which are no longer in use. What happens to them after they cease to be used?

From a cognitive perspective – which is obligatory given that economic actions (production) are performed by individuals – knowledge is associated with mental processes. By definition, knowledge is bound up with mental processes, and mental processes take place in human brains. The accumulation

and de-cumulation of knowledge is consequently constrained by the working logic of natural cognitive systems (Simon, 1978).

In principle, technical knowledge, like any other kind of knowledge, exists independently of the fact that it is embodied in action. Before actions take place, technical knowledge resides in people's brains and remains in them long after the performance of those actions has ceased. A technical norm which is no longer used because of technological progress (or for some other reason) persists in the cognitive systems of individuals.

This introduces a fundamental distinction among levels at which '*knowledge in the region*' can be described. Firstly, there is the knowledge identified by scanning the cognitive systems of the region's population – regardless of the fact that such knowledge is in use or not. Secondly, there is the knowledge that can be identified on the basis of the production processes actually undertaken in the region. The knowledge to be found in factories, workshops and cottages resides by definition in the cognitive systems of the region's population. But the reverse is not true.

The difference between *knowledge in use* and *knowledge not in use* does not increase as a consequence of technological progress. This is because unused knowledge may disappear from the cognitive systems of individuals (and, therefore, from the region) after a period of time. Knowledge may also disappear from a region after being discharged from the production process as a consequence of emigration – a very common phenomenon indeed.

Knowledge *may also be archived and made available for later use*. This introduces the third level of description of knowledge in a region: that of codified and archived knowledge. This knowledge may be found by scanning archives, or it may obtained by assembling scattered pieces of evidence to reconstruct coherent patterns of knowledge.

These three levels at which 'knowledge in the region' can be described *partially* overlap, in the sense that in many instances they concern the same technical norms. Yet they yield different results in practice, which suggests that estimating the amount of traditional knowledge in a region at a given point in time *is an empirical undertaking*. It is the outcome of a specific – specific to that region – and path-dependent technological trajectory.

The way in which natural brains (those of individuals) and 'artificial brains' (those of organisations) work, and the way in which technological progress manifests itself, ensure that one can safely expect to find a certain amount of unused technical norms when examining a region. Unused traditional knowledge may accumulate slowly or rapidly, depending on the development trajectory that the region has followed. Normally, if it is generated by technological progress, it accumulates relatively slowly in the economy. But the

process is much more rapid if the region is subject to an external shock which induces industrial restructuring and long term unemployment.

As with any other kind of unused capital, the question arises as to the role that a region's extant stock of unused traditional knowledge may play in shaping the future development trajectory of that region – with or without specific policies.

2.4 The regional specificity of traditional knowledge

Before turning to the question of the potential use of unused traditional knowledge, discussion is required of the issue of the regional specificity of production knowledge. This is again an empirical question. Logically, it may be true that a given technology has been used in only one region, and that, therefore, only the technological trajectory of that region has generated the type of unused traditional knowledge to be observed in that region. In practice, however, the same type of used or unused traditional knowledge is to be found in more than one region.

The spatial-specificity of production knowledge is a very common feature when a given technology is developed for use with, for example, agricultural produce – which is obtained using matter-energy (resources) available only in that region. In this case, the transfer of codified knowledge to other regions would have been pointless because its technical norms could not be applied outside the region.

Yet in most manufacturing activities the codification and transfer of knowledge is a matter of fact, with the consequence that strictly region-specific knowledge is very rare. For example, the knowledge-base for footwear production is very similar in most regions specialised in the manufacture of shoes. The same kind of traditional knowledge is to be found in these regions. Inspection of footwear production technology (at national and trans-national levels) does not reveal many significant differences.

A further aspect is that, in many cases, traditional knowledge can be very easily acquired. The fact that it is to be found in a region reflects the path-dependent co-evolutionary process between culture and technology in that region. But once the knowledge has been acquired, it may prove relatively easy to codify and transfer items of traditional knowledge.

The fact that traditional knowledge can be transferred is important because it implies that such knowledge does not easily yield an absolute competitive advantage. In fact, because at any particular time there is more than one region endowed with the same kind of traditional knowledge – or which can acquire the same kind of traditional knowledge (like knowledge in general) – regional

development is the outcome of a *successful* competition game among regions – a competition game that may rely on relative prices.

Very often, however, traditional knowledge is associated with a situation in which there are 'resources' located only in a specific region – as frequently happens in the agro-industry sector. In this case, however easy it may be to transfer traditional knowledge, the transfer does not take place unless the spatial transfer of resources takes place as well. (Transfer from one territories to another of 'local' resources is, however, increasingly taking place also in the agricultural production process, undermining the concept of 'local agricultural produce'.)

2.5 Traditional knowledge, meta-preferences and relative prices

From an institutionalist perspective, meta-preferences cannot be taken as given (Hirschman, 1984; Hirsch, 1995; Kuper, 1999). Changes at this societal level – changes which may be unpredictable, widespread and profound – are of great importance for understanding economic development and, also, for proper understanding of the use of traditional knowledge. Moreover, adequate account must be taken of the fact that individuals are normally clustered into groups with different meta-preferences. The size of these groups changes over time, and this change – given relative prices – affects the demand structure for consumption goods and the economic value of traditional technical norms, as well as the value of any kind of technical norm.

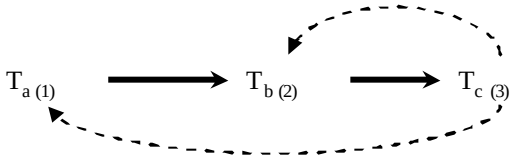
A change in meta-preferences amounts to a change in how a good is conceptualised. Suddenly or slowly, a consumer starts looking at the relationship between the price and functionality of a good in a different way. At a certain point in time a 'novelty' arises in the form of a new orientation towards the 'commodities space'. For instance, a consumer or a group of consumers may start giving importance to the environmental implications of the technology used to produce the commodity considered. Commodity A may be identical in its use to commodity B but have a greater negative environmental impact (more environmental negative externalities) as far as the production or discharge processes are concerned. And this difference may begin to matter to a *certain number of consumers* at a given point in time. The ethical implications of a given technology may also become a matter of concern to a given consumer, and likewise a different way of interpreting the functionality of a commodity.

Because the shift from technology *c* to technology *b* or *a*, changes the consumer's meta-preferences, for instance, it may no longer be seen as neutral in terms of functionality. As a consequence – as illustrated by Figure 2 – a

given consumer may shift his/her demand to commodity x produced with technology b or a – now interpreted as a product different from the one produced with technology c.

If we start from the concept of meta-preferences, we cannot rule out the possibility that a shift in meta-preferences may at a certain stage give relevance to symbolic, ethical, environmental aspects of production, radically reshaping the demand structure of individuals, and consequently restoring economic viability to technologies left behind in the technological trajectory. This shift may take place at any time during the technological trajectory T. As illustrated by Figure 2, technology a or technology b – and the knowledge they require to be produced – may become once again economically relevant as a consequence of a shift in meta-preferences.

Figure 2 – Backward technology switch



The economic significance of technological trajectories, especially for consumption goods, depends largely on the configuration of the meta-preferences prevailing in society and on the shifts occurring at that level. From an institutionalist perspective (Hamilton, 1999; Hodgson, 1988) culture co-evolves with technology. As the interplay between technological progress and relative prices generates the knowledge trajectory illustrated in Figure 1, a shift in the meta-preferences may take place, as illustrated in Figure 2, and generate a 'backward switch of technologies', so that commodity x_a is again demanded by a more or less large group of consumers.[5]

It is interesting to observe that social systems are spurious in many senses, and that meta-preferences are very far from being homogenous in regard to a given population.. The social structure – this seems to be true in some

[5] Often observed is what can be labelled 'backward-forward technological switch': a situation in which the old technology is rediscovered and slightly modified by inserting some new technical norms.

European societies more than in others, in certain period more than in others – seems to create a certain amount of demand for commodities based on traditional knowledge. How large this amount is depends on many contingent facts, to be ascertained empirically.

The phenomenon of 'backward technology switch' may have important implications for regional development. For a change in meta-preferences to significantly affect regional development it does not have to concern all consumers but only some of them. A relatively small change in meta-preferences at national or global level may give rise to an increase in region-specific demand sufficient to support the economy of the region concerned. For example, over the past decade Italy has seen a wide (and unexpected) shift to traditional food and traditional agricultural production brought about by a marked change in meta-preferences. This shift has increased demand for goods with a high content of traditional knowledge and, in turn, it has had a major impact on some small local systems (but no significant impact on others).

2.6 Traditional knowledge and learning

The phenomenon of backward technologies switch discussed in the previous section pointed to the possibility that traditional knowledge may 'return' and again be of some use – indeed, crucial use – in the economic process. The re-use of traditional technical norms is certainly important in principle, and it is apparently important in practice as well. But this is not the only way in which extant traditional knowledge can influence regional development trajectories. There are two further functions that it can perform. Firstly, 'old' technical norms may be used in the production of new products (new for the region or new in general). Technological progress may be such that some traditional norms fit well with the string of technical norms required for a new product. For example, some technical norms used to produce leather shoes are also necessary to produce leather bags. Secondly – and this is the point on which this section focuses – traditional knowledge *may be the basis of a learning process* which up-grades human capital in the region.

Knowledge cannot be separated from the mental processes which give it a significance – nor can it be separated from the cognitive system supporting those mental processes. Consequently one can infer, from the knowledge possessed by an individual the 'features' of his/her cognitive system; and hence also his/her potential for learning associated with his/her knowledge base and 'intelligence'. From this perspective, traditional knowledge is relevant not in itself, but because it signals and sustains a sort of orientation to learn and not only a capacity to learn.

Within this conceptual framework, unused traditional knowledge is the starting point for a learning process which may be able to adjust the knowledge existing in a region at time t to the requirements imposed by the evolution of the region itself. This mechanism is important in regions which have undergone a process of rapid de-industrialisation or, in general, a transformation of their economy. These regions by definition possess a considerable amount of unused traditional knowledge – often associated with high unemployment. This knowledge, however, is located in the brains of individuals, and (to change perspective) one may ask what kind of systems (workers) these systems are – not simply what kind of reusable knowledge (technical norms) is to be found in these systems. Looking at these systems one may want to stress their knowledge; but one may also want to stress their intelligence, and in particular their ability to implement a learning process (one that is either spontaneous or induced by incentives).

Given the direct relationship between the system's knowledge and intelligence, one is tempted not to distinguish between these levels of description of the same system. In fact, however, these are two quite different aspects. What policy-makers should value in a region with a high amount of unused traditional knowledge is the intelligence of individuals and their ability to learn.[6] Therefore, the stock of traditional knowledge to be found in a region is an important signal to policy-makers and entrepreneurs of that region's learning potential. Indeed, the analytical and policy focus on 'knowledge in the region' is coherent with the view of extant traditional knowledge as the starting point for a learning process.

3 Local development and traditional knowledge: two case-studies

3.1 Traditional knowledge in declining regions

The Italian pattern of regional development has attracted much attention in Europe, and it has done so mostly because of the several cases of unexpected and fast trajectories of 'local industrialisation' apparent in the period 1950-2000 – and which significantly contributed to the overall good performance of

[6] This may be of help in addressing the critical issue of the 'regionalisation of innovation' (Hilpert, 2003) in periods of industrial restructuring. More important than the knowledge to be found in a region may be the ability of that region to learn by building on existing knowledge – a process that seems to be common and consistent with the persisting success of the same regions or 'islands of innovation' (Hilpert, 1991).

the Italian economy. Yet Italy is also a country with numerous cases of regional economic decline. In the period 1950-1980 especially, hundreds of local systems – generally 'small towns' in the Apennines, Alps and other areas stretching across broad territories – experienced striking reductions in their populations and levels of activity which created a conspicuous amount of unused physical capital.

The phenomenon of economic decline has not yet attracted much theoretical attention, even though a large part of the Italian population has been involved in these economic trajectories through forced emigration, early retirement, and reductions in the value of their entitlements. 'Losing' areas are, however, interesting units of analysis with regard to the role of traditional knowledge because the production processes of all of them have been substantially based on traditional knowledge as a consequence of decades of technological stability. Under the pressure imposed by integration into national markets, many regions declined rapidly – and, apparently, irreversibly.

In the context of Italian society at the time, traditional knowledge appeared to be a social relic – more an hindrance to development than anything else. Three decades later, however, traditional knowledge has resurfaced as an 'asset' with which to promote local development.

3.2 The 'Sibillini Mountains Region': a trajectory of economic decline[7]

The region briefly examined in this section is the 'Sibillini Mountains Region', an area located in Central Italy between the Marches and Umbria. It had a population of about 52,000 inhabitants in the early 1950s and has about 24,000 inhabitants today (Table 1). This region is endowed with extraordinary cultural and natural capital but it has followed a trajectory of strong economic decline – one of the most marked in Italy – notwithstanding the fact that various generations of regional policies have sought to foster its economic development since the 1980s.

In the early 1990s most of this region was given the status of a national park and a new generation of development policies started to be designed – although only partly and slowly implemented. However the new status of national park has set in motion a process which has led to rediscover the value of the territory and also the potentials for development one finds in the territories itself.

[7] This section is based on field research conducted by the author in the region between 1998 and 2001, during which period he was scientific coordinator of the 'economic development plan' for the "Sibillini Mountains National Park".

Table 1 – Some basic data - 2001

Surface Kmq	Population	Population density	Total firms	Total employment (*)
1,277	23,509	18	2,378	6,212

(*) Primary sector included

Source: ISTAT, Census of population 2001; Census of industry and services 2001

With 1,242 people at present employed in the manufacturing sector and marginal agriculture, the local economy is largely kept alive by the purchasing power of retirees. This sustains private services because it is mostly spent locally. Another pillar of the economic base is the public sector necessary to produce basic public services (locally) (Table 2).

Table 2 – Firms and employment in the local production system (*) – 2001

	Firms	*Firms*	Employment	*Employment*
Industry	679	*29.0*	2,185	*35.6*
Private services	1,206	*51.5*	2,204	*35.9*
Public services	458	*19.5*	1,747	*28.5*
Total employment	2,343	*100.0*	6,136	*100.0*

(*) Non-agricultural sectors

Source: ISTAT, Census of industry and services 2001

The region and its development trajectory

At the beginning of the 1950s the economy of this region was dominated by agriculture organised according to the traditional share-cropping system which governed agricultural production (and social reproduction) in most parts of Central Italy until the 1970s. Agriculture had the typical features of 'traditional agriculture': it was labour intensive, with low capitalisation and productivity, and with substantial self-production. A wide variety of agricultural

commodities were exported to Central Italy and consumed in the towns and cities of the region – the general pattern of mountain agriculture in Italy during the 1950s.

The decline of the Sibillini Mountains Region after the 1950s was manifest in a marked reduction in its population and a progressive increase in the proportion of retired people in the region, as well as an overall strong reduction of the productive base. In the period 1961-2001 the resident population decreased by about 19,000 inhabitants, which was equal to a negative rate of change of 44%. If we take the population aged 65 and over as a proxy for retired people, in 2001 this age class accounted for 28.5% of the region's total population, whereas in 1971 the figure had been 17.6%.[8] Over two decades, large-scale emigration caused a striking reduction in population and sharply reduced demand for locally-produced agricultural commodities. On the other hand, local agriculture lost its specificity by introducing standard technologies with which to produce standard products, being prompted to do so by the newly-introduced incentives schemes of the Common Agriculture Policy of the European Union. There followed a substantial increase in productivity, but also a constant reduction in farmed land, which in the period 1961-2001 decreased by 35% (while farms reduced by 70%).

The collapse of the agricultural sector was not counterbalanced by a growth of industry – despite the fact that the region had been subject to several generations of industrialisation policies (and part of the region was eligible for benefits under the "Cassa per il Mezzogiorno Programme"). After some very weak signs of industrialisation (Table 3) employment in the manufacturing sector slipped back to 1,242 employed persons – a level of activity only a little higher than it had been in the 1960s. (For most of this marginal region the social and economic premises for a trajectory of industrial growth were not in place. When industrialisation policies were implemented they invariably failed, or they produced such weak effects that they were irrelevant to the overall development trajectory.)

[8] The ratio between people aged over 65 and children aged 0 to 14 was very high, amounting to 237 (Census of Population 2001). Consequently, for every 100 young people there were 237 old people.

Table 3 – Employment and firms trend in the manufacturing activities

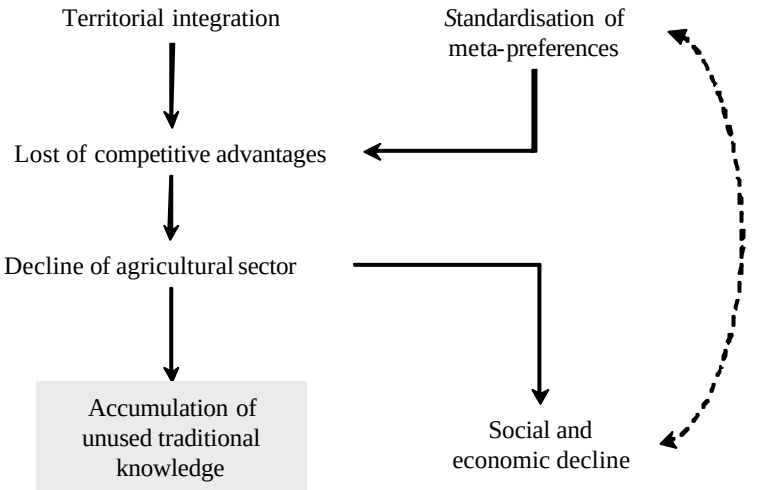
	1961	1981	2001
Employment	850	1,782	1,242
Index number	*100*	*210*	*146*
Firms	498	432	330
Index number	*100*	*87*	*66*

Source: ISTAT - time series 1951-2001

The accumulation of unused traditional knowledge

Figure 3 depicts the pattern of causal chains that can explain the trajectory of decline of the Sibillini Mountains Region. Territorial integration – exchange of commodities with other regions in the context of a national (and European) market – revealed that most local economic activities – in particular, agriculture – were not competitive on the new territorial scale of national and European markets. This trend was reinforced by the standardisation of local meta-preferences (as part of the general process of modernisation) which greatly reduced the specificity of consumer demand and turned prices into the key factor.

Figure 3 – Economic decline and use of traditional knowledge



Indeed, changes in meta-preferences may lead to the standardisation of demand and production, making relative prices dominant in determining the level of local demand. In this situation, regions compete through prices, and traditional knowledge either becomes irrelevant or acts as a factor hampering competition in that it is an obstacle against standardisation. The consequence was a sharp decline of traditional agriculture which led to the accumulation of unused traditional knowledge in the region.

At the level of the production process, traditional knowledge greatly diminished in importance, firstly because most traditional production disappeared, and secondly because technological progress required the introduction of new technical norms (knowledge about how to use chemical nutrients became important, and organic farming methods were no longer applied).

The use of traditional knowledge was greatly reduced because agricultural firms had lost their evolutionary dynamics, investment orientation and financial viability. It only survived because independent farmers were willing to accept low incomes – robustly supported by the CAP and by regional cohesion measures.

According to the conceptual framework outlined in Section 2, two levels of description of the region must be considered when assessing the presence of *traditional knowledge* and its potential use in a development strategy for the region. On observing the production process, one easily infers that the number of total employed and the number of employed using a significant amount of traditional knowledge have decreased substantially. Moreover, the number of traditional technical norms being used in production processes has decreased as a consequence of the kind of technological progress which has taken place.

The area's knowledge trajectory can be understood by looking at the re-location of traditional knowledge within the system. Traditional knowledge did not disappear from the region as a consequence of the decline of, and technological progress in, the agricultural sector. Firstly, some traditional knowledge remained in the region because retired workers continued to live there. Emigration, however large-scale, did not lead to the complete disappearance of the previously employed workforce. Secondly, traditional knowledge as an abstract formulation of production actions, as previously discussed, is independent from its use. Most of the traditional knowledge in the Sibillini Mountains Region had already been codified by the 1960s. If knowledge is codified, it can be stored – and therefore retrieved from the 'archives' – so that it can be reused at a later time. From the early 1900s onwards, significant efforts were made to codify it. The Sibillini Mountains Region was a complex society already in the 1950s, with a class of 'intellectuals' closely interested in interpretation of the local society to which they belonged.

Moreover, the presence of important historical cities at the outer edge of the region (Spoleto, Camerino, Ascoli Piceno, Perugia) ensured that social interest in the region never vanished. Given its great historical importance, the region remained 'observed' and 'supported'.

Thirdly, a core of farmers active in the 1950s were still alive well into the 1990s (some of them are still active). Traditional knowledge therefore remained embedded in the cognitive systems of the population, and also to a certain extent in the practice of agriculture. A contributing factor was that a certain amount of demand for traditional and locally produced commodities still persisted: for various kinds of cheese, pork products – a staple in the region – some local legumes such as lentils.

Persisting demand for traditionally and locally produced commodities was fuelled by three main factors. The first was the local population itself, because its age structure – a high and growing percentage of 'old' people – gave a certain stability to meta-preferences. The second factor consisted of people who had emigrated to cities – principally Rome – whose closeness allowed them to retain a relationship with the region, so that the 'export' of its traditional products could be easily organised.[9] The third factor was tourism, which greatly – and increasingly – sustained demand for locally produced food and (to a lesser extent) handicrafts.

Interestingly, in the past decade in particular, local society has rediscovered traditional production as a constitutive element of its identity. Moreover, tourists have greatly increased their preference for traditional commodities. Finally, Central Italy as a whole has witnessed a sharp increase of interest in local products. This demand for traditional and locally produced commodities has greatly facilitated the codification of traditional knowledge and kept alive traditional agricultural methods, most of which are again being used.

The use of traditional knowledge

Since the early 1990s, as already noted, there has been an unexpected and widespread shift in meta-preferences to traditional agricultural produce in Italy partly linked with the general aim of revitalising rural areas, and with the more specific objective of landscape conservation. This shift in meta-preferences has given a second chance to marginal areas where traditional knowledge is still

[9] A remarkable example is provided by the mountain town of Norcia (about 5,000 inhabitants nowadays). As a settlement of outstanding historical and architectural value, the town's economy was greatly sustained by its function as a 'gateway' to local traditional production – especially for Central Italy, and Rome in particular.

available. Nevertheless, the local effects of this shift in meta-preferences depend on factors besides the availability of traditional knowledge.

When demand for traditional products is expressed by at the global level, it regards 'traditional products' in general and, not a specific product produced in the region. In closed systems with a strong cultural identity, demand for local products arises mainly among local consumers (although this is an attitude that may disappear). But worldwide the supply of traditional products is very large, with the consequence that there is competition in the market for traditional foods. This competition is centred more on the features of the commodities than on their prices, but it is a competition that the region must win in order to capture a sufficient share of the global demand.

Most territorial policies for losing areas (often mountain areas in Italy) seek to increase competition in the global market for traditional agricultural produce.[10] That a region is, at a certain point in time, a reservoir of traditional knowledge – as in the case of the Sibillini Mountains Region – is not, however, a sufficient condition for its development, even though a shift of meta-preferences may have greatly increased demand for its traditional products. Traditional knowledge must be put to use, and this requires organisations and institutional arrangements that make the relative technology (and technical norms) economically viable by constructing a quasi-monopolistic market and remaining competitive within that market.

3.3 The Marches footwear industrial district: a trajectory of economic growth

The second region examined is the Marche Region's footwear industrial district, the largest in Italy (and possibly in Europe) (Table 4). The focus is on the core of the industrial district: a 'functional urban area (or 'dispersed city') of about 137,000 people with a specialised manufacturing sector .

By exploiting the returns to scale generated by the process of territorial coalescence, until the late 1990s this local system grew in size and complexity and soon became an 'innovative milieu' able to generate investment and innovation. This 'dispersed city' has consolidated in the past 20 years into an industrial city (Table 5) – 59% of total employment is still in the industrial sector – achieving remarkable industrial growth[11].

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[10] This is fostered by different classes of policies, for instance the 'LEADER Projects' launched by the European Union.

[11] See Calafati (2005) for a critical-historical analysis of the conceptualisation of space in the Italian economic literature.

Table 4 – Some basic data – 2001

Surface Kmq	Population	Population density	Total firms	Total employment (T)	Footwear firms	Footwear employment (F)	F/T
328	136,538	416	14,882	60,553	4,687	25,210	*41.6*

Source: ISTAT, Census of population 2001; Census of industry and services 2001

In the past five years, against the background of the new configuration of markets in terms of relative prices, the region seems to have entered a new stage of its recent economic history. The prospect of a rapid decrease in its industrial base has now become a concrete reality. The region's industrial success used to be based on its firms' competitiveness in the European Common Market. The system's static efficiency (costs) and dynamic efficiency (innovation) were rooted in its socio-economic structure and the relative prices structure prevailing in Europe until the late 1990s (when exchange rates were fixed in preparation for introduction of the Euro, a sharp re-configuration of relative prices began).

A certain pattern of meta-preferences for traditional shoes was a second key element in generating increased demand for all the types of footwear produced in the district. But in the past five years a profound change in the competition space has taken place in Europe as a result of enlargement of the European Union and the radical internationalisation of the European economy. As a consequence, the competitive space for firms has radically changed – and within the new competitive space, the competitiveness of business firms has greatly diminished.

Table 5 – Firms and employment in the local production system (*) - 2001

	Firms	*Firms*	Employment	*Employment*
Industry	5,489	*36.9*	35,912	*59.3*
Private services	7,355	*49.4*	17,173	*28.4*
Public services	1,838	*12.4*	6,879	*11.4*
Total employment	14,882	*100.0*	60,553	*100.0*

(*) Non-agricultural sectors

Source: ISTAT, Census of industry and services 2001

A trajectory of local development

In the early 1950s the economy of this region, like that of the Marches and most of Central Italy, was largely dominated by agriculture. There was, however, an already-existing manufacturing sector centred on footwear production. This manufacturing core was the starting point for an astonishing, export-led growth path. The region was able 'to capture' the growing demand for shoes in Italy and Europe and started its development trajectory. As a consequence of industrial growth, employment in the manufacturing sector grew from 13,025 units in 1961 to 34,061 units in 2001 (Table 6), and the region's population increased by 52% in four decades, mainly as a result of immigration. Immigration on such a large scale exerted a (positive) shock on the local economy which increased employment in the building sector and in many service activities.

The economy of the region is highly specialised. At the beginning of the 1950s the manufacturing sector was to a certain extent already specialised in footwear production, but the degree of its specialisation has constantly grown since then.

With 4,687 firms engaged in manufacturing activities (they had numbered 1,981 in 1961) and with 74% of employment concentrated in 'leather goods and footwear production', this local system has to be regarded as an 'industrial city'. Networks of business firms, the operation of which was made possible by low 'transaction costs', were able to compete successfully in the world market, with employment in manufacturing activities rising from 13,025 units in 1961 to 34,061 units in 2001.

Table 6 – Employment and firms in the manufacturing activities and in the footwear sector

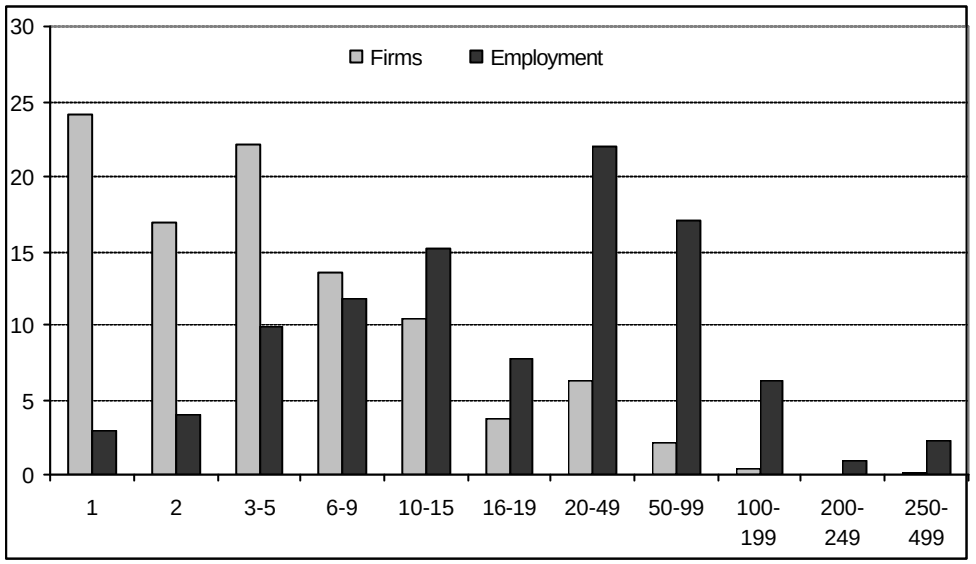
	1961	1981	2001
Employment			
Manufacturing activities	13,25	36,701	34,061
Index number	*100*	*282*	*261*
Footwear sector	8,340	29,032	25,210
Index number	*100*	*348*	*302*
Specialisation rate	*64.0*	*79.1*	*74.0*
Firms			
Manufacturing activities	1,981	4,994	4,687
Index number	*100*	*252*	*237*
Footwear sector	1,017	3,544	2,995
Index number	*100*	*348*	*294*

Source: ISTAT - time series 1951-2001

The footwear sector displays the organisation that Italian analysts regard as typical of the 'industrial district'. The sector's productive structure is highly fragmented (Figure 4) – 63% of footwear enterprises are in the 1-5 units size class – and it is typical of a production process based on the vertical disintegration of production: a limited number of leader enterprises which outsource phases of the productive process to a large number of small and very small enterprises. The typical governance system of industry is the informal, relatively stable and hierarchical 'network of firms'.

Moreover, as typical of this type of organisation, there have been a large number of new firm start-ups: the increase in employment has been due to the growth of existing firms and to the birth of new ones. These new firms have arisen from within the local system ('endogenous development'); and local economic growth has been – necessarily, given the high degree of economic specialisation of the manufacturing sector – export-led.

Figure 4 – Firms and employment in the footwear sector by class of dimension – 2001, percentage values



Source: ISTAT, Census of industry and Services 2001

The availability of financial capital, entrepreneurial spirit, intra-family credit, the existence of 'niches' within industrial networks, technology divisibility, and social capital are factors to be used in a model explaining the birth of these new, small and very small firms. Low risk and repeated transactions, number of firms and exit options, and trust are factors which have been proposed in the literature to explain the low transaction costs that have made the local business network possible.

The accumulation and de-cumulation of traditional knowledge

Until the mid-1990s the footwear sector was a 'traditional sector'. Notwithstanding permanent changes in the shape (and components) of the final product, production technology had evolved through maintenance of a large number of *traditional* technical norms. The production of hand-made shoes entailed the use of a large number of traditional technical norms, and most types of shoes required the hand manipulation of the materials. Until the

early 1990s technological progress had not altered the importance of traditional knowledge.

Since then, employment in the region's footwear sector has grown considerably, and the number of people (workforce and retired workers) with a command of traditional knowledge has grown considerably as well. The region is thus a reservoir of traditional knowledge, most of which is in use.

The traditional knowledge present in the region, however, is not territory-specific. Firstly, unlike the previous case (see Section 3.2), the raw materials used in the production process are not territory-specific: they are imported into the local system and then transformed. Technological progress has not been based on a co-evolutionary process between *local* matter-energy and *local* knowledge – as instead invariably happens in the case of agricultural systems.

Moreover, there are other footwear industrial districts in Italy which comprise the same – or very similar – type of knowledge and traditional knowledge. Hence, this kind of traditional knowledge does not automatically give the region a competitive advantage. Indeed, actual and potential competition between industrial districts producing the 'same' product has marked the development of these local systems. The comparative efficiency of the production process and its learning ability have been the key factors in generating the growth path of this industrial district – and not the regional specificity of knowledge.

The use of traditional knowledge

Traditional knowledge was in the past 'protected' by the success of the products in which it was embedded. The region's remarkable capital accumulation trajectory was based on a technological trajectory that retained a large part of traditional knowledge. But the products – specific types of shoes (made of leather and expressing the so-called 'Italian style') – were demanded not for the social implications of the technologies used but rather for their features (given that they remained within a certain price range).

In recent years, both the scale of local production and the technologies used have sharply reduced the importance of traditional knowledge. Firstly, the past decade has been marked by a slow but steady change in meta-preferences epitomised by a shift of demand to 'sports shoes', 'plastic shoes', 'non-durable shoes'. These require a different technology, lower standards of workmanship, different tools and materials. For instance, certain features of high-quality hand-made shoes – absolute perfection of shape – are no longer relevant (they are not even detectable in the case of this new type of product). Traditional knowledge has become less and less important because of changes in

technologies driven by changes in meta-preferences. These changes are, in principle, reversible but they have taken place and have reduced the market for shoes produced by relying on traditional knowledge.

The second fundamental factor is the relative efficiency of the production process whether it is organised inside or outside the region. In the footwear sector, de-localisation may be implemented without a significant change of technology, because the same kind of knowledge (and traditional knowledge as well) can be easily found in other regions in Europe or outside Europe. The footwear sector is a highly traditional sector, well developed in most socities: all the European countries (not to mention India and China) have developed strong footwear sectors and have accumulated a large amount of knowledge. Moreover, the knowledge to produce shoes is easily transferred. Given the long-standing presence of shoemakers in most societies, the question is how to upgrade it rather than how to accumulate it from scratch.

For many Italian industrial districts – and also the one considered here – the preferred strategy in the context of the new configuration of international economic relationships is to de-localise – that is, to use knowledge present in other systems for production. This is a consequence of the fact that the locally available knowledge is no longer 'comparatively economically viable', in the sense that it can only be put into use at a higher cost than elsewhere.[12]

Given the current configuration of local relative prices and given the ubiquity of the knowledge required to produce shoes, the scale of production in this region is expected to undergo sharp decline. The reduction of employment will initially re-locate traditional knowledge from firms to society at large, according to the model previously discussed. However, a considerable number of footwear firms running their business as usual – and producing high-quality traditional products – are likely to remain largely dependent on the evolution of meta-preferences in Italy, Europe and elsewhere.

The previous case showed that traditional knowledge can regain an important role decades after it has practically lost significance in the economic process. But, paradoxically, this seems more likely if in the meantime the region has experienced a sharp decline in its population, and if there has been a spontaneous 're-sizing' of the system.

For industrial regions like the footwear industrial district of the Marche Region, the traditional knowledge accumulated in local society may be best put to use as the basis for knowledge up-grading. But a critical factor in this respect is the structure of the population. If total employment diminishes because of (induced or spontaneous) early retirement and generates emigration, any

[12] Moreover, shoes now demanded in Italy and in Europe can be directly imported in increasing amounts – further reducing the scale of local production.

attempt to induce a knowledge up-grading trajectory may prove difficult. Vice versa, knowledge up-grading may be a feasible strategy if the population has an age structure where the 20-45 age class is sufficiently large and individuals have strong work-oriented motivations.

4 Conclusion

Traditional knowledge, like any form of knowledge, is constrained in its economic use in the market by relative prices, technologies and meta-preferences. Shifts in meta-preferences, technological progress and relative prices change the economic significance of traditional knowledge in the production process. But it is important to take note of the fact – clearly illustrated by the two case-studies discussed – that this is a process that can operate in both directions. Traditional knowledge used in the production process can be devalued and 'expelled' from it by a new configuration of technologies, relative prices and meta-preferences. This is what is happening in the Marche Region's footwear industrial district. Yet the opposite is possible as well. A new configuration of the factors indicated above can revitalise unused traditional knowledge – retrieving it from the brains of individuals, the archives, and the workshops that still use it. This is clearly illustrated by the recent evolution of the Sibillini Mountains Region – but it is a process to be observed in many 'marginal' regions in Italy.

Technologies, relative prices and meta-preferences certainly co-evolve, but it does not seem possible to construct a deterministic and general model of this evolutionary process. The economic significance of traditional knowledge can be ascertained only with regard to a specific space-time context, within which a given configuration of meta-preferences, relative prices and technologies takes shape. Further reflection on the conceptual framework within which to address this important issue is therefore necessary.

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