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THE HALO EFFECT: A WIDENED PERSPECTIVE ON THE RELATIONSHIP BETWEEN FORESTRY AND THE RURAL ECONOMY

This article reviews the development of interest in the relationship between forestry and rural development in developed countries and, using evidence from recent research in Europe, suggests a need for a widening of the methods by which economic impacts are investigated. This need for a widening of the approaches to economic appraisal of impacts stems from the profound halo effects evident in the UK case studies, which circumstantial evidence suggests are likely to be replicated in the more developed and densely populated parts of Europe.
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Introduction

For most of the last 30 years forestry and its relationship with rural development has been a minor strand in forest research. IUFRO Working group S6.11-02 on Forestry and Rural Development in Industrialized Countries has held a number of meetings, including at Fredericton and Aberdeen, but it would be fair to say that until the late 1990s the interest in forestry and rural development was modest. One of the real difficulties of exploring this subject was that the general trend in forest employment, whether direct or indirect and induced, was downwards. Productivist forestry was being transformed by new technologies and the processing sector was becoming increasingly concentrated in large employment-poor but capital-intensive plants. Forestry might generate substantial output, but its contribution to employment was decreasing and other changes taking place in rural areas were emerging as more important drivers of economic change. Observing forestry's contribution to rural development through the lens of production forestry was not unlike watching an iceberg melting.

However, in recent years, rural development has emerged as a major focus of rural policy, particularly in Western Europe, largely as a result of the crisis in the Common Agricultural Policy (and more widely in production-oriented rural land use). It has become apparent that rural economies, rather than comprising places where primary production is concentrated, have increasingly become places where the forces of consumption drive economic success or failure. Since the upsurge of interest in rural development foresters have also taken a rather stronger interest in the subject and a number of research projects in Europe have been conducted in different parts of Europe. The FORWARD project associated with Pentti Hyttinen,

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Andreas Ottitsch and Anssi Niskenen at EFI (2), an earlier COST action energised by Nils Koch (3), the EU project led by Udo Mantau (4) (Mantau *et al.* 2001), the EU MULTIFOR project run by Freerk Wiersum and Birgit Elands (5), and the ongoing Innoforce project run by Ewald Rametsteiner from BOKU illustrate examples of this new genre of research.

These studies take very different perspectives on forestry and its relationship with rural development. The FORWARD project sought to unravel the causal factors in successful regional forestry economies. The COST action was much more multi-stranded, and was more an information sharing opportunity for its participants than a research project. Mantau and his colleagues explored the scope for developing new markets relating to recreational and environmental services. Wiersum and Elands took a much broader view of rural development and sought to establish the concept of value of forests in a socio-cultural rather than a strictly economic sense. Innoforce focuses around innovation in the forest sector and is drawing on a range of ideas about innovation to explore new options in the forest sector.

As a socio-economic researcher interested in the drivers of rural economic change and the consequences of these changes on sustainable rural development, it has become increasingly apparent to me that the quality of natural environment emerges as a powerful force in providing a green infrastructure within which economic activity takes place. This has not been an explicit focus of any of the studies, although the results of the MULTIFOR project indicate the importance of recreation demands. Within those areas of high quality natural environment, trees, woodland and forest are often particularly important features. Further, certain types of trees, woodland and forest have greater values than others. In the UK, native broadleaves and Scots pine clearly number amongst the most highly valued components of the UK's green infrastructure. They tend to be associated with concentrations of tourist activity or of areas of high residential value.

Some Background Issues in Economic Evaluation

Taking any standard economics textbook on the forest sector such as Johnson, Grayson and Bradley (6) we find a standard neo-classical treatment of the forest sector. The laws of supply and demand, the treatment of time in economics, and the recognition of non-market components of forestry are the core concerns. However, the relationship between these conventional neoclassical economic approaches to forest economics and rural development is far from clear. Market diagrams might yield general indications of price trends (with potentially profound effects for forest owners) or of the 'floating' contribution of non-market values to society welfare, but rural development refers much more explicitly to the wellbeing of rural households and the receipt of benefits from trees in particular geographical contexts.

Derided as the people who know the price of everything but the value of nothing, economists have made major strides in the last few years in putting a value on what are termed 'externalities'. Externalities have been defined as unpriced economic effects from one agent on another agent. They may be positive or negative. They have been the subject of almost unremitting attention from forest economists, who have used non-market values as a means of rationalising forestry (see Stewart Roper and Park 1999 (7) for a compendium on this), with only occasional dissenting voices (8). Positive examples include landscape and wildlife,

and pollution is the most widely cited negative example. Measurement of these external effects is now widely used as an input into policy making and a recent study values the positive effects for the UK forest at c £1,000 million per annum (9), a figure significantly greater than timber sales over the same period.

Moving beyond the conventional neo-classical approach, Mantau *et al*. (10) explored the scope for new enterprise development in forestry, through a mixed methods approach, based first on diagnosing the nature of forest products and services within a private good – public good matrix and then using tools of institutional analysis to explore the scope for market development. They found, unsurprisingly, that forest users who have historically been able to obtain forest service benefits for nothing are rather reluctant to pay for most services. The opportunities for such product/service developments are conditioned by market demand, which is likely to be highly variable from place to place and shaped by institutional structures and the cross elasticities of demand for private and public provision of forest and woodland services.

Over and above the traditional economic approaches, there is a parallel (if modest) interest in what we might term rural development impacts, which in the UK and Ireland at least, have been scrutinised principally through regional Input-Output analysis (11). Here the focus is on forestry and its regional economic linkages and its employment intensity. This first step out of the forest and into the wider rural regional economy inevitably raises questions about forestry and its relationship with its input suppliers and its processors. Where are they located? What value do they add? And in so doing, what regional employment and output is created? However, such appraisals must be set against a background of a rapidly declining workforce (12).

In some parts of Europe there has been a resurgence of interest in the wider impact of forest and woodland on livelihoods. This interest has grown from research and extension approaches applied normally in developing countries but is seen as having relevance by some to the developed country context (13). Further, this perspective may be of particular interest when exploring the wellbeing of households in remote and often poor areas of economies in transition, where woodfuel and building materials may be crucial contributors to local livelihoods. The contribution of forest and woodland to livelihoods varies enormously from place to place. It can come from wood fuel or berries and mushrooms or the provision of dog-walking or other recreational space. Some of these livelihood elements have a measurable opportunity benefit/return, which should be the market cost of the alternative (fuel or food); others such as dog walking are essentially non-market benefits. It may be less the marketed benefits of some of these non-timber forest products that are of significance, and more their symbolic role in community life or their ability to provide benefits for poor, elderly or immobile people.

Although community benefits are often seen as a rather separate issue from economic benefits, in practice the boundaries between the two are often very fuzzy (as both the evidence from social capital/innovative milieu studies and the livelihood approach, alluded to above suggest). Much attention has been paid to the importance of social capital in development. Social capital building can be seen as something that is good of itself or it can be seen as a way of building networks and trust which will eventually impact on economic development. The growing

thrust towards community land ownership and the powerful engagement of some communities with woodland projects is a testament to the social capital building role of woodlands, which may produce spillover benefits into the economic arena. The potential contribution of forest and woodland to social capital building, evidenced in activity in many parts of Scotland, from Laggan to Abriachan to north Sutherland, also provides a further justification of the livelihoods approach with its identification of the potential role of social capital in development. These non-timber forest products are firmly on the new forestry agenda, but if we think of the impacts of these in a regional economic sense there are still some more pieces to the jigsaw puzzle to be fitted.

If economists are to contribute significantly to the rural development agenda, they need to think beyond their dualistic economic conception of market goods and non-market goods (14) (see Mantau *et al*. 2001, for a starting point on this topic) and address two particular concerns. First, they need to better understand the complex array of institutional and policy variables that shape differences in economic activity, in particular the scope for private sector market development, between places. Second, they need to think about what has been termed the shadow value or halo effects of the value of green infrastructure on rural development. In different ways the Mantau and Hyttinen studies both focus on different aspects of the institutional and policy setting.

Mantau's work exposes how forest-related market opportunities are shaped by the configuration of property rights. One of the principal conclusions of the Hyttinen study was that an explanatory framework of the differences in performance of forestry in regional economies is based on 'local-specific, sectoral and policy related factors and the role of human agency' p. 109 (15). Such a conclusion resonates with findings from other parts of Europe that suggests that local factors (such as the knowledge and skill base and social capital), sometimes referred to as an innovative milieu, underpin the performance of certain successful regions.

In relation to the value of the green infrastructure, the CJC Consulting Report to DEFRA and the Treasury (16) gives surprisingly little information on the value of this to rural development and rather downplays its significance. In contrast the OECD (17) emphasise the importance of 'cultivating rural amenities' as a means of underpinning economic development. In practice, a non-market benefit may be captured by the forest owner, by another local economic actor or by noone and effectively float off into the ether. Normal accounting procedures are highly developed in relation to normal business accounting, quite good at measuring the non-market benefits in what are often described as environmentally adjusted accounts, but actually very bad at measuring the halo or shadow effects of an external benefit. It is this last type of benefit that is the principal but not exclusive focus of this paper.

Through its impact on landscape and biodiversity, forestry affects tourism and recreation and residential choice. These human choices of where to holiday, where to take a day trip to or where to live can have profound economic consequences on rural development, which all too often have been ignored by academic economists or even the consultancy community when forestry has been the focus of interest.

The distribution of forest and woodland is important in understanding its economic impact. Forestry in some regions may have primarily a production value and little else, whereas in other areas, the other values of forestry may be much more

important. For example in the UK there are some extensive areas of spruce production in Southern and Western Scotland, Northern England and Wales. Their values are likely to be largely conditioned by production values. However, the case of native pinewoods may be different. There are three major areas of pinewoods in Scotland in Deeside, in Strathspey and in the Affric/Strathfarrar area. In addition, there is a substantial area of planted Scots pine, often adjacent or relatively close to these native pinewoods. In two of these tree-rich areas, Strathspey and Deeside, there has been a substantial injection of wealth, which can be attributed at least in part to the presence of trees. In the third, greater remoteness and important biodiversity designations have militated against significant development. Nonetheless, in all of them forestry contributes to rural development for reasons other than timber production. Elsewhere in the UK, the native woodlands of the Lake District or of South East England are intimately connected with the areas tourist and residential values.

Rural Development

Most conventional approaches to economic analysis pay modest attention to the regional context in which forestry takes place, which is the arena of concern to those interested in rural development. Other types of economic analysis, particularly regional economic impact studies, have been developed to examine the impacts of particular projects or particular type of economic activity on regional economies. A number of regional impact studies have been undertaken. Often they are driven by the desire of a sponsoring body to justify a particular type of activity, and, without wishing to impugn the reputation of those who undertook the work, the assertion of high multipliers in sporting shooting (18) or game fishing should not of itself be taken as making the case for more of that activity (or even its retention) in the absence of comparable economic evidence of where else that resource could be used within the regional economy and with what effects. What these studies reveal is that if the concern is with the wider rural economy then different types of economic analysis must be conducted. For example wild geese have been a source of considerable damage to farmland in some parts of Scotland (19). If the unit of analysis is the individual farm or the aggregated farm population in a geese wintering area, the economic cost is considerable. If however, the wider economic impacts are explored and the benefits to the local economy of visiting bird watchers or hunters are factored in the cost is very much less.

In the UK, it has become increasingly apparent that the traditional primary rural economy and its connected industries will be unable to sustain the rural population. The reduction in the size of the primary workforce has been substantial and can be seen as both a response to industrial restructuring – the replacement of men with machines (see Johnson and Price, 1996, for an indication of the scale of this in forestry in Wales (20)) and the poor financial performance of the sector and the low wage rates that tend to go with this.

Because of regional economic disparities, policies have been designed at national and European levels to address the problems of slow or negative growth in some regions. There is a long(-ish) history of state intervention in regional policy, which includes offering a range of interventions to support the more disadvantaged rural areas. Since the emergence of regional policy in the 1930s, economists have advanced the cause of economic redistribution at the same time as trying to

address efficiency issues through the reduction of inflationary pressures (e.g. on wage rates and house prices) in expanding regions. In the last decade, the interventions have often come under the umbrella of EU schemes, where certain areas have been designated as less developed and comprehensive plans been devised to remedy their disadvantage. Forestry has figured in a number of these, though at times the public sector forest has been ineligible for the core funding and has had to seek alternative discretionary funds, such as under the EU LIFE Initiative.

However, most contemporary rural economies in the UK are not in general in a state of decline, although the decline of population in some rural areas is indisputable. Indeed the opposite is often the case, at least in terms of numbers of people. Whereas Scotland as a whole, the number of people is declining, many rural areas are increasing in population. Both in Deeside and in Strathspey, two of the core Scots pine districts in Scotland, there is substantial evidence of population growth over the last thirty years. Indeed, over the period between 1991 and 2006 these two former local councils were two of the projected five double-digit growth districts in rural Scotland (21). This has been in part a planned process, with substantial public investment in Aviemore from the mid-1960s as a growth centre and tourist hub, and in part market-driven, a result of the sum of many consumers' preferences for tree-rich rather than tree-poor areas as places to live.

Tourism is a major part of the Scottish rural economy. It accounts for over a third of the workforce in Badenoch and Strathspey. A recent Forestry Commission-sponsored study (22) estimated that 2.5% (£163 million) of all Scottish tourism expenditure was on day visits to forests and in selected forest-rich areas in the UK, between 10 and 17% of all tourism expenditure could be considered 'forest associated'.

Historically, people have tended to follow work in their residential choices. The recent Stepping Stones to Healthier Rural Futures (23) report of the Countryside Agency flags the importance of incomers in creating new employment in rural areas. However, recent work from Scandinavia (24) suggests that the majority of incomers who have moved into rural areas in Sweden have done so not because of new employment but because of residential preference. These new residents may create certain tensions, but they also create economic flows. Whether they are working outwith rural areas but making their home base in the countryside or retiring into rural areas, they are creating economic impacts by their spending behaviour. These economic flows are increasingly the lifeblood of rural communities.

A New Approach to Measurement

Introduction

The methods described below were developed for a Forestry Commission project and in slightly modified form are being applied to a Scottish context in ongoing work. At the time the Forestry Commission was keen to establish the full impact of forestry on rural development. The methods were designed as a means of scoping the task. What emerged were findings that raised some very important questions about the regional/rural development impacts of forestry in an English setting that may well have resonance in a Scottish context.

The team that developed these techniques comprised a cultural geographer, Rhys Evans, a regional economist, Deb Roberts and myself from a rural socio-economics background (25). The challenge that we set about was to ask ourselves a simple question: What would be the loss of economic activity in the study area if the trees, woodland and forest were not there?

The first group of economic impacts comprises the conventional purchases and outputs generated by the forest owner and the subsequent downstream effects, which have been widely studied (26). These comprise expenditures on planting and maintenance which may or may not benefit local businesses, either directly or indirectly, and payments received for forest outputs such as timber, game, sale of fishing rights to lochs or rivers within the forest or the use of the forest for car rallies, orienteering or other sporting activity. The extent, to which the forest products are processed within the local economy, will frame the overall economic impact in rural areas.

We termed the second group of economic impacts 'shadow' effects. This is potentially a source of ambiguity because of the use of the specific and different use of the term shadow pricing in Cost Benefit Analysis. However, in this study we felt that the metaphor of a shadow was an appropriate way of examining these wider impacts. Trees cast a shadow over surrounding economic activity, which may be beneficial or negative in its effects. The term halo effect has been subsequently suggested. We felt that two types of economic entity might benefit (or conceivably suffer) from living and operating in the shadow of the forest. The first of these types of entity is non-forestry businesses; indeed businesses that are not owned by the forest owner but which can be seen to parasitise some attributes of the forest, such as its view, access opportunities, screening effects etc. When we conducted our fieldwork we decided to approach a range of local businesses, but reduced this down to a set of tourism and recreational–related businesses, including accommodation providers, cycle hire firms, etc.

Our interest was in establishing the proportion of the business' turnover and employment attributable to the presence of trees, woodland and forest. What simpler way could there be of finding out about the contribution of trees and woodland than asking those business owners to attribute a proportion of their turnover to the presence of tress and woodland?

The second type of economic entity examined was households. Where it could be proved conclusively that the household's decision to live within a particular area was in part determined by the presence of nearby trees, woodland and forest, the resultant economic flows associated with the purchasing of local goods and services can be seen, in part at least, as forest-dependent. Again, on the assumption that households as economic agents are capable of attributing value to the different drivers of their locational choices, it should be possible to factor out the tree/woodland related component.

The third type of economic impact comprises non-market effects, which can be analysed using conventional non-market benefit estimation procedures (27). The main types of non-market benefits comprise landscape, informal recreation, biodiversity, carbon storage and soil and water protection. These benefits are not actually receipts by local economic actors because they are by definition non-market benefits.

The final type of value to be considered is the social and cultural values. These can be considered as values in their own right or as actual potential contributors to economic value.

Table 1

The Methods Used in the UFIRD Study

Type of Value	Methods		Outcome
	Stage 1	Stage 2	
Task 1. Forest values • Planting and maintenance • Harvesting • Amenity forest management	Surveys with forest managers and other forestry-related local businesses	Keynesian local income and employment multipliers	Understanding forestry's contribution to rural development
Task 2a. Shadow values from forest-related tourism and recreation • Day visits • Overnight visits	Surveys with tourism specialists Estimation of level and pattern of forest-related tourism expenditures	As above	
Task 2b. Shadow values attributed to households influence of forests on location decisions • Households	Analysis of findings from focus groups and follow-up interviews Estimation of proportion of household and business expenditures attributable to the presence of forest and woodland in the locality	As above	
Task 3. Non-Market Values • Carbon sequestration • Biodiversity • Air Quality • Recreation	Collect information on characteristics of woodland(s) (e.g. locational characteristics, species types, age etc)	Benefit Transfer methods	
Task 4. Social Values • Historic • Cultural • Symbolic	Collect information though focus group and follow-up interviews with local households	Interpretive methods	

Methods

The methods used for the first three elements of the overall economic impact assessment are essentially identical. What must be assessed is the injection of money into the regional economy arising from 'forestry'. This comprises the income generated by forest owners, some of which is recycled locally, through sales and purchases, the income derived by parasitic firms as a result of their proximity to forests and the income generated by the local economy as a result of purchases by

households whose presence in the region is at least partly determined by the presence of forests.
We are thus concerned with two challenges: first an apportioning exercise (How much of the income injection into the regional economy is attributable to forests?) and a local economic modelling exercise (How does the injection flow around the local economy and impact on other economic activity?).
The first question requires information on forests as economic entities, firms which parasitise the forest (and the proportion of their turnover attributable to the presence of forestry) and households whose presence in the area is at least partially influenced by the presence of forestry (and the proportion of their turnover attributable to the presence of forestry). The second question requires a multiplier model, which exposes the linkages and connections within local economies.

Results

The results presented here are for two areas in eastern and south-eastern England, which are very different setting to the areas of Scotland dominated by Scots pine. Three main conclusions can be drawn from the findings. First, the overwhelming impact on these rural economies derives from the shadow values or halo effects. Second, there are major differences in the residential and business shadow effects between the two areas, which on reflection can be attributed to their location. Third, there are quite big variations of the ratio of market to non-market benefits between the two areas, which are attributable in part to the intrinsic differences in woodland type but are also strongly shaped by local geographies.

Table 2a

Income and Non-Market Values Mid-Bedfordshire

Mid-Bedfordshire	£ million income and non-market values
Total income effect from forestry	0.636
Total income effect from forest dependent tourism	3.043
Total income effect from residential shadow	8.330 – 24.990
Non market values – Informal recreation	1.400 – 2.600
– Carbon sink	0.035 – 0.114

Source: UFIRD 2003.

Table 2b

Income and Non-Market Values Breckland

Breckland	£ million income and non-market values
Total income effect from forestry	3.315
Total income effect from forest dependent tourism	20.45
Total income effect from residential shadow	6.100 – 18.300
Non market values – Informal recreation	1.040 – 1.870
– Carbon sink	0.537 – 1.608

Source: UFIRD 2003.

Other Studies

There is now widespread recognition of the regenerative value of a forest and woodland environment in economic development in rural areas. Many woodland projects are taking place around the UK to nurture rural development outcomes

from forestry. Some of these explicitly ignore the mainstream forest sector. For example the Heartwoods project in the West Midlands targeted SMEs (particularly micro-businesses) and ignored the mainstream forestry processing sector, even where they were located within the project area. The mid-term evaluation (28) questioned the logic of this, in spite of the project team's use of the rhetoric of embeddedness to justify their actions. Other projects in the UK include the South West Forest project in central-north Devon and Cumbria Woodlands in north–west England. In most of these projects the creation or enhancement of a green infrastructure of woodland is seen as a foundation around which forestry and non-forestry SMEs can accrete.

Perhaps the most widely cited example of forestry investment contributing to rural development is the mountain biking trails at Coed-y-Brenin in Wales. Coed-y-Brenin is located in a remote part of north-west Wales on the southern edge of the Snowdonia National Park. It is part of the Forestry Commission's estate. A few years ago, largely due to the drive of one of its employees, a mountain bike trail was established. A significant development was initiated costing about £200,000 (300,000 Euros). Initial results concerning the impact of this project have suggested an astonishing effect on visitor spend in the area with an estimated injection of over £4 million annually in tourist campsites, restaurants, bike shops etc. Given estimates of c 50,000 per full time job equivalent in tourism this investment has generated c 80 full time jobs. Even at half of this figure it would be regarded by any regional development agency as a resounding success.

The Implications for Analysis of Regional Development Arising from Forests and Woodland

Past studies of the economics of forestry have been largely limited to a study of the economics of timber production and a study of the non-market benefits. However, as the RSPB realised some years ago, it is the impact of a particular land use on the local economy, rather than any abstract non-market value, that will be instrumental in local support for that activity (29). The earlier approaches to forestry ignore these wider regional impacts. The regional impact models, which are based solely on wood supply chains, do the same, because they ignore the firms which are not part of the forest ownership structure but are at least partially forest-dependent. The challenge is to assess the degree of forest dependence. Further, there is widespread evidence of residential in-migration to these tree-rich areas, both for commuting and retirement and for the creation of new lifestyle businesses. The challenge here is to establish the degree to which the forestry influences this decision.

However, we should be cautious about assigning too much value to these halo or shadow effects without understanding fully the importance of regional geographies. The Greensand ridge in Mid-Bedfordshire attracts in rich commuters who work in Bedford, Milton Keynes or even London, all of which outside the boundary of our study area. Their sheer numbers have a profound impact on regional economies. In Breckland, the forests (and heathland) provide an island of access opportunity in a sea of intensive agriculture. It is unsurprising that there should be such a significant tourist sector, which includes the large Center Parcs complex at Brandon. In the areas of native pinewoods in Scotland there are other competing attractants and it may be difficult to separate out the effect of the forests from the

lochs and the mountains and to assess the marginal benefit of native pine over birch or spruce.

Intuitively however, we would anticipate significant impacts arising from these shadow effects, elsewhere in the UK and Europe. In Scotland, such values are likely to be highest in somewhere like the Deeside corridor in the hinterland of an expanding city such as Aberdeen, or where tourism exercises an important impact on the local economy as in Strathspey. In the high environmental quality natural forests of Glen Affric/Strathfarrar area, these halo effects are likely to be much less. Elsewhere in Europe, there will be big differences between the values of forest and woodland in peri-urban and tourist regions and in the lightly populated areas where production values may continue to predominate. We must understand better the meso- and micro-geography of demand from tourists and those wanting to live in an area.

These results raise questions about how woodlands might be managed to better deliver these green infrastructure environmental services and also about how such services might be paid for. Given the parlous economics of commercial silviculture, it may be possible to internalise the externalities as has been achieved by Rothiemurchus estate with its array of visitor enterprises, but such opportunities are not universally available (30). For other woodland owners, financial incentives are one possibility but, in addition, there is a need to think about how a fair distribution of value can be achieved. In new housing developments there must be scope for the use of planning gain (31). There may even be scope for a hypothecated component of council tax, or the use of local tourist taxes to enhance the environment, with native woodland as a potential beneficiary.

The mountain bike example in Wales raises important questions about the role of forestry and specifically about the role of the state in the provision of infrastructure which other firms are then free to parasitise as they think fit. In many cash-strapped private forests there would clearly be an attempt to recoup the capital costs and in practice the state forest is in the ideal position to do this. It could initiate a franchise operation or even engage directly itself in such a business.

Taking the perspective of the COST E30 project, we need to rethink the breadth of the remit of the action. Are we interested just in forestry businesses, whose overall impact on rural development may be significant in some rather special cases, or are we interested in the green infrastructure/halo effect of forestry and the constellation of entrepreneurial activities that parasitise forestry investment? It is likely that over large areas of Europe the latter is far greater in its economic significance than the former.

Conclusions

It is certain that the contribution of forest, woods and trees to rural development goes far beyond their value as a commercial timber crop. There is a danger that when the price of timber is so low we look at woodlands as uneconomic resources, when in fact they deliver a range of environmental services that have profound economic impacts on the communities and regions in which they are located. These wider effects create a seedbed for entrepreneurship. Even though the new firms are not necessarily part of a forest or woodland holding, their at least partial dependence on the forest means that their economic footprint is in part at least forest-dependent.

However, it is vital that new economic tools are assessed in order to estimate the wider benefits of forestry to rural society and economy. The halo effects, which we assert are so important, are seen as legitimate benefits by the Treasury in their Green Book (32), but there are to date no agreed estimating procedures beyond those used in the UFIRD study. The critical question that the economist must ask himself is: How much worse off would the regional economy of forested areas be in the absence of trees? Our modest journey on that voyage of discovery suggests that past attempts to measure this loss are likely to seriously underestimate the true value and create a distorted impression of the forest economy that fails to expose the full value of multifunctional forests to society as a whole. They are likely to underestimate the impact on rural development, on entrepreneurship and on aggregate economic activity. It is essential to move beyond a mindset of forestry activity as production driven encapsulated only by the entrepreneurial activities of forest owners and traditional (or even new) forestry-based or forest product-based activities. Udo Mantau has exposed the importance of forest-based services. This study suggests that even though the forest owner cannot always capture these, they should be a primary focus of interest if we wish to understand the full impact of forests on rural development and entrepreneurial activity.

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