

**SEVENTH FRAMEWORK PROGRAMME
THEME 9
Socio-economic Sciences and Humanities**

Grant agreement for: Collaborative Project

Annex I - “Description of Work”

Project acronym: **COINVEST**

Project full title: **Competitiveness, Innovation and Intangible Investment in Europe**

Grant agreement no.: 217512

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List of Beneficiaries

Beneficiary Number	Beneficiary name	Beneficiary short name	Country	Date enter project	Date exit project
1	Imperial College of Science, Technology and Medicine Queen Mary and Westfield College, University of London	IC	UK	Month 7	Month 30
2	The Conference Board in Europe	TCBE	BE	Month 1	Month 30
3	Istituto Superior Técnico Lisboa	IST	PT	Month 1	Month 30
4	Institutet för Näringslivsforskning	IFN	SE	Month 1	Month

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5	Club Ekonomika 2000	CLUB2000	BU	Month 1	Month 30
6	Zentrum fuer Europaische Wirtschaftsforschung GmbH	ZEW	DE	Month 1	Month 30
7	GRECSTA/INSEE	CNRS- GRECSTA	FR	Month 1	Month 30
8	Queen Mary and Westfield College, University of London	QMUL	UK	Month 1	Month 30

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PART A**A.1 BUDGET BREAKDOWN AND PROJECT SUMMARY***A1.1 Overall budget breakdown for the project*

Project Number 1	217512	Project Acronym 2	COINVEST
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One Form per Project

Participant number in this project 3	Participant short name	Estimated eligible costs (whole duration of the project)					Total rec
		RTD / Innovation (A)	Demonstration (B)	Management (C)	Other (D)	Total A+B+C+D	
1	QMUL	360,875.00	0.00	126,588.00	0.00	487,463.00	
2	TCBE	420,800.00	0.00	8,000.00	0.00	428,800.00	
3	IST	109,939.00	0.00	8,000.00	0.00	117,939.00	
4	IFN	226,620.00	0.00	8,000.00	0.00	234,620.00	
5	CLUB2000	124,480.00	0.00	8,000.00	0.00	132,480.00	
6	ZEW	267,918.00	0.00	8,000.00	0.00	275,918.00	
7	CNRS-GRECSTA	209,606.00	0.00	8,000.00	0.00	217,606.00	
TOTAL		1,720,238.00	0.00	174,588.00	0.00	1,894,826.00	

A.2 PROJECT SUMMARY FORM

A1:

Our project

Project Number ¹	217512	Project Acronym ²	COINVEST
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ONE FORM PER PROJECT

GENERAL INFORMATION

Project title ³	Competitiveness, Innovation and Intangible Investment in Europe		
Starting date ⁴	The first day of the month after the signature by the Commission		
Duration in months ⁵	24		
Call (part) identifier ⁶	FP7-SSH-2007-1		
Activity code(s) most relevant to your topic ⁷	SSH-2007-1.1-02: Intangible investments and innovation in Europe		
Free keywords ⁸	Competitiveness, Innovation, Intangible Investment		

Abstract ⁹ (max. 2000 char.)

We aim to understand the contributions of intangible investments to innovation, competitiveness, growth and productivity in Europe. Such a project is, we feel, vital to help EU policy formation and deepen our understanding of some of the most crucial questions facing EU economic policy. The reason is simple. Currently, (almost all) intangible investments are either not measured, or treated as an intermediate input into production so they are assumed to produce no durable assets for firms or economies. Does this matter? In practice, most knowledge investments involve intangible spending. And, the Lisbon agenda aims to make the EU "the most competitive and dynamic knowledge-driven economy by 2010 (our italics)". Thus we are in the difficult position of having perhaps the major EU policy aspiration backed by almost no data or measures. This project will set out a method and collect the data required. Given the issue's importance, we believe our work will make a considerable contribution. Some knowledge investment is counted as such in the key economic measures such as GDP (e.g. software). However, R&D and other knowledge investment (like investment in human capital via training, investment in reputation capital, investment in organisational capital etc) are all treated as day-to-day expenses, not investment. Thus, under current conventions, investment and GDP in an economy whose businesses spend €1 more on almost all knowledge investment is the same as an economy whose businesses turn up their air-conditioning. Therefore, we have put together a small-scale but focused team comprising some of Europe's (and the world's) leading experts on these questions, spanning business, policy and measurement interests. The project will collect data on a wide range of knowledge investment, at macro and micro levels, incorporate these into macro and micro performance measures and thus greatly improve our understanding of knowledge-driven economies and firms and policy.

A.3 LIST OF BENEFICIARIES

Beneficiary no. */ Participant	Organisation name	Country
1	Imperial College of Science, Technology and Medicine	United Kingdom
2	The Conference Board Europe (TCBE)	Belgium
3	Istituto Superior Técnico Lisboa (IST)	Portugal
4	Confederation of Swedish Enterprise (CSE)	Sweden
5	Club Ekonomika 2000 (CLUB2000)	Bulgaria
6	Zentrum fuer Europaische Wirtschaftsforschung GmbH (ZEW)	Germany
7	GRECSTA/INSEE (CNRS-GRECSTA)	France
8	Queen Mary, University of London (QMUL)	United Kingdom

B1. CONCEPT AND OBJECTIVES, PROGRESS BEYOND STATE-OF-THE-ART, S/T METHODOLOGY AND WORK PLAN

B1.1. Concept and objectives

A major challenge currently facing the EU economies is to reap the benefits of the “knowledge economy”. The US appears to be doing so but the EU seems to be left behind (van Ark, 2006, Basu et al, 2003). This is a matter of major policy importance. With the more intensive participation of China and India in the global economy, doubling almost overnight the labour pool in the tradable economy, barely a day goes by when commentators argue that the only future for Europe is to specialise in knowledge-intensive activities. This aspiration is enshrined in the Lisbon agenda, which aimed to make the EU “the most competitive and dynamic knowledge-driven economy by 2010” (EU, 2007). The puzzle is that – paraphrasing Solow’s 1987 quip on computers and statistics – whilst the knowledge economy seems to be all around us, it is hard to see it in the macro statistics. The importance of the knowledge economy can be seen from the popular media, or, perhaps more formally, in the current composition of the basket of goods underlying the consumer price index in advanced countries. It now includes commonplace goods, many based on ICT, that were almost unheard of even five years ago: in-car satellite navigation systems, digital photo processing and downloaded mobile phone ring tones.¹

In the meantime macroeconomic performance measures hardly reflect this change. Recent numbers from the EU KLEMS database (funded under the 6th Framework Programme) show that the overall share of investment in GDP in EU countries has fallen on average from around 18% in 1980 to 14% in 2004, and even the share of ICT hardware in total investment has increased from only 3% to 5%. This evidence is hard to square with the perception that firms are investing in knowledge assets in the teeth of an unprecedented technological revolution. Neither EU labour productivity growth or total factor productivity growth has picked up, if anything even decelerating over the 1990s (Timmer, O’Mahony and van Ark, 2007).

The fact that all this is so hard to see suggests (at least) two hypotheses. The first possibility is that the knowledge economy is almost totally hidden from view because such “intangible” investment is not measured. The second is that even if the intangible investments would have been measured, the impact on economic growth is in fact much less than popular discussion would suggest and has been puffed up by ill-informed commentators and self-interested lobbyists.

Of course we cannot test these two hypotheses without data. and so the central ideas in this project are as follows:

- (a) extend and improve the measurement of intangible investment underlying the knowledge economy and

¹ In the UK, for example, some items removed in the latest revision to the Consumer Price Index Basket include 35mm compact cameras (replaced with digital cameras) and video cassettes (replaced with DVDs).

- (b) examine the effects on the economy (at aggregate and sector levels) with (the hopefully) improved measures, and
- (c) study intangibles at the firm level.

Regarding (a), it might be asked why we need to examine measurement in such detail. The problem is highlighted in the important papers by Corrado, Hulten and Sichel (2004, 2006, henceforth CHS) and Nakamura (see e.g. 1999) and is the following. In accounting terms, spending on most knowledge assets is spending on intangible assets. Now, spending on *tangible* assets has a long measurement tradition. It is part of investment and so of GDP. Survey instruments have long been developed to measure it. As Michael Mandel commented in a recent *Business Week* article, we know (for the US in his example) pretty accurately how much money railroads spend on furniture (\$39m in 2004).

However, spending on *intangible* assets, with a few exceptions, is treated very differently. Firstly, much of it is often not measured at all (for example spending on design or training might be in management accounts but is typically only otherwise available from special surveys). Second, even if it is measured, it is typically expensed rather than capitalised. In National Accounting terms, it is treated like spending on intermediate goods. R&D for example, is treated like spending on electricity. It is assumed not to be investment and therefore does not produce any asset at the end of the period. Being a purely intermediate good it does not appear in GDP data. In short, under current national accounting conventions, the measured investment and GDP of an economy whose businesses spend €1 more on R&D looks exactly the same as an economy whose businesses turn up the air-conditioning in their buildings.

Two further points are worth making. First, is this project then just treating currently measured R&D in a more sophisticated way? No. Underlying the knowledge economy is investment by firms and workers in knowledge assets. Such assets take many forms. Measured R&D is mostly defined as scientific R&D² (so for example financial services typically do almost zero measured R&D). But it is well –acknowledged that R&D is much broader than just scientific R&D. For example, one might argue that employer-spending on training is “R&D” in staff (and like scientific R&D in products, may or may not succeed and may or may not stay within the firm). Similarly, much of the knowledge in computer software is likely an investment rather than an intermediate good (and current national accounts conventions do treat it to be capitalised not expensed). Along with design, firm spending on training and building company organisational capital for example, the project will broaden the measure of investment in intangibles beyond just R&D. It is worth noting in passing that this is potentially important. For example, in the UK in 2004 for example, market-sector R&D spending was about £12bn (excluding the computer industry), software spending was around £22bn and employer-provided training about £48bn, (Giorgio Marrano and Haskel, 2006, table 2, henceforth GH and Giorgio Marrano, Haskel and Wallis, 2007, henceforth GHW).

Second, whilst in theory capitalising expenditures affects GDP, investment and productivity growth, see below for a formal analysis, will it make any difference in practice? The CHS results and our preliminary work for the UK suggests it might very well do. GHW find (a) nominal investment in intangible assets is similar to nominal investment in tangibles (around 10% of market sector GDP in 2004) (b) the level of nominal market sector GVA is therefore understated by about 10% (c) the UK tangible investment share has

² As Okubo et al (2006), point out the quality that distinguishes Frascati-based R&D from related activity is “the resolution of scientific and/or technical uncertainty.”

been falling but the tangible plus intangible investment share has been rising (d) instead of UK MFP falling since 1990, it has actually been rising. All in all, the inclusion of intangibles makes a substantial difference to UK macro performance.

Whether it affects EU performance and comparative EU performance is just what the project will try to find out. Thus the specific objectives, in measurable and verifiable form are as follows:

1. To find out what data are available on intangible assets in different countries (Work Package 1)

We shall start with an initial scoping exercise to survey data availability in different countries. We already have some idea of what is available, but need to do more work to see what can be found at the industry level and how comparable such data are. We are confident that we can make some estimates of intangibles at the whole economy (likely private sector level but the availability of industry data needs more scoping).

2. To find out what intangible assets EU economies invest in and how much they spend (Work Package 2)

To answer this, we shall co-ordinate the collection of data on the categories of intangible assets set out by CHS and implemented for the UK by GHW. While there is some ongoing work for a few EU countries (Finland, France, Germany, Netherlands), there is a need for more international coordination. In particular issues concerning comparability of data, depreciation methods for intangibles, the measurement of the output of those items, etc., deserve more research and harmonization. We have put together a consortium of interested countries but will also explore early in the project the feasibility of co-operating with other countries. Data allowing, the approach will be extended to an industry level, in first instance between manufacturing and market services, with a more detailed disaggregation wherever possible. All this will allow the first step of making a cross-country comparison, for the most recent year available, of investing in intangible assets.

3. To measure the effects within each country of intangible asset expenditure on economic performance (Work Package 3 and 4)

We look at the consequence for a number of key variables. First, we look to see the consequences for GDP. GDP potentially rises since more of what is currently regarded as intermediate spending is investment. Second, we also look at the consequences for investment, where we expect the investment share to increase. Third, we look too at the labour share, which will fall since the extra GDP goes to compensating the extra capital in the economy. Fourth, we look at the consequences for labour productivity growth (LPG) and total factor productivity growth (MFPG). The level of labour productivity rises, but LPG only rises if the level of GDP rises increasingly over the period. But how much is then due to changes in intangible assets? The level of MFP falls, since there is an extra input in the economy, namely an intangible capital stock, but it is not clear if MFPG rises or not, since we need to see how much has the change in the intangible capital stock contributed to growth and productivity growth along with other inputs. The systematic method of answering this question is via growth accounting and so we extend previous growth accounting studies by including intangible capital. We can then draw out the implications for the Euro economy for innovation and competitiveness. This question bridges two Work Packages since we will need to collect time series data for each country and then analyse it.

4. To see how comparative cross-country economic performance is affected by intangible investment (Work Package 5).

The idea here is as follows. If intangible investment is counted as such then it raises GDP. This then potentially changes cross-country productivity and performance comparisons. Of course, if all countries invest a similar fraction of GDP in intangibles then relative rankings will not change, but we need to undertake the work to find this out. We similarly will want to compare cross-country MFP which will change with the addition of intangibles.

Data allowing, we shall look here at the above issues but by industry. The industry definition is difficult and we are not clear what data are available and hence this is speculative. We shall have to develop conventions to be consistently applied across countries in line with the availability of industry data.

5. To relate our findings to micro data analysis (Work Package 7)

This macro data work is an essential first step to pointing towards what area of work might be developed, in particular by micro analysis. Thus our final step, data allowing, we shall also try to examine the effects of intangible investment in firms and between firm differences in such investment. The major problem here is that the official statistics hardly collect information on intangibles systematically and hence few firms record such investments. Thus we shall proceed in a number of ways. First, competition authorities often seek to measure intangible assets in the course of inquiries and we shall examine these data and methods. Second, the EU Community Innovation Survey does ask a number of firm-level questions about a range of intangible asset spending by firms (in the UK, for example, spending on training, branding, design etc.). There are formidable problems with using CIS for this purpose, in particular in a cross-country comparative framework. For example, the precise implementation of the survey may differ between countries, and information on actual expenditures is often lacking. But since the CIS can be matched, in some countries at least, to the Production Census, this offers us the best chance of looking at micro data in parallel to the macro data that we shall try to assemble. Third, one can also make direct use of financial information from business. For example, on the basis of annual income statements, expenditures (e.g. on R&D) that are clearly intended to increase future income are not treated as a cost but as an investment. The new capital item then needs to be depreciated, and other items, such as the part advertising budget designed to launch new products and gain market share, is also added. The Conference Board has already begun some exploratory work with knowledge-intensive businesses themselves in developing a set of metrics to help business measure and evaluate intangibles.

B.1.2 Progress beyond the state of the art

Brief description of current state of the art and where the project starts from

The current state of the art on the macro and micro side is the following. On the macro side, there are first steps by the PRISIM project, which produced some tentative estimates of some intangible investments. More recently, the key macro contributions have been Corrado, Hulten and Sichel (2004, 2006, henceforth CHS) and Nakamura (see e.g. 1999). They have pioneered a method of valuing intangibles, followed also for the

UK by Giorgio Marrano and Haskel (2006). This method, we believe, is the starting macro point for developing work for the different countries as set out in detail in our original proposal. Some academics in some countries are currently embarking on projects to try to measure better intangibles along the lines suggested by CHS for example, for the whole economy. But these projects are by no means finished, apply only for the whole economy, and, as we have found in the work on the UK economy, producing something comparable with other countries is time-consuming and requires co-ordination. For example, the treatment of self-employed is highly variable across different countries and this matters in the computation of wage shares which then affects the growth accounting. This was an issue that made a large difference in the informal comparison of UK and US data that we undertook in February. So the projects will keep things co-ordinated and focused with a relatively small group of countries.

The starting micro point is a series of streams of work on R&D, ICT and other intangibles. Perhaps the most relevant micro literature is the stream of papers by Brynjoffloson and co-authors which strongly suggest that the productivity effects of the installation of ICT hardware depend critically on co-investment in organisational change. These papers use the relation between market values and book and surveyed values to infer the value of intangible assets at the firm. Instead, we shall seek to measure the value of intangible assets by directly observing the costs involved in creating them. This work is of course complementary to that work and not in competition.

Thus the baseline data against which the project will measure its progress can be thought of as macro and micro data. The baseline macro data is the EUKLEMS data describing in a growth-accounting framework the determinants of growth. The progress of our work can therefore be judged as to whether we add to that data, for those data do not measure intangible assets. Just as those data measure and explain the proximate causes of economic growth in terms of tangible assets, our work will build on this by asking (i) how do productivity growth and levels change when we add intangible assets and (ii) what fraction of those changes in growth and levels are explained by the additional intangible assets that we shall measure? Thus our project can be judged by the extent to which we answer these questions. Both these questions are innovative since they have not been answered before because the data have not been available.

Our specific outputs here will be to examine how intangible investment affects some of the major areas of economic activity such as (a) GDP (b) investment (c) the share of wages and capital in output and (d) productivity (labour and total factor). We shall also, subject to confidentiality restrictions, make these data available for others to use. Finally, we shall make available the computer code that undertakes the revised GDP and growth accounting data (currently just over 1,000 lines of STATA code, with the cross-country productivity levels analysis to come) and integrate it with the existing codes (which are in SAS).

Turning to the micro side, the baseline data here are the range of micro data sets that measure productivity and various intangibles. Our work here is rather more speculative since we will need to find out what micro data sets are available. As mentioned above, we shall therefore proceed in a number of ways; using competition authority work, drawing on various micro data sets such as the EU Community Innovation Survey and financial information from business and other datasets that we shall investigate. Our output on this side can therefore be judged by the advances that we will make over the small number of microdata sets that have these information.

B.1.3 S&T methodology and associated work plan

Our scientific method for the macro work can be summarised in the following steps. These are the steps that will dictate the data that the project consortium shall collect and the calculations that we undertake with these data and so guide our work plan, details of which are set out below.

Our investigations will proceed with the following steps:

- *Collect investment data in intangibles and compare across countries*

For each country, we shall collect a time series of nominal investment in intangible assets and merge this with data on tangible asset investment (to build upon the EUKLEMS project for example). We shall measure intangibles under a number of headings. We follow CHS in identifying three main intangible asset classes:

- computerised information (mainly software),
- innovative property (mainly scientific and non-scientific R&D) and
- firm competencies (company spending on the following dimensions of capital: reputation, human and organisational capital).

These categories accord with, for example, categories used by competition authorities in calculating intangible assets for the purposes of competition analysis, see GH (2006).

- *Computerised information*

Here we require data on spending on computer software and building information in computer databases. At a first pass, we can obtain these data from EUKLEMS (Timmer, O'Mahony and van Ark, 2007), but shall have to check for consistency etc.

- *Innovative property.*

Innovative property in the CHS framework consists in turn of

1. scientific R&D, typically leading to a patent or licence, usually captured in R&D surveys
2. mineral exploration
3. copyright and licence costs (spending for the development of artistic originals, usually leading to a copyright or licence)
4. other product development, design and research expenses (not necessarily leading to a patent or copyright), attempting to cover product development in the financial services industry, new architectural and engineering designs and R&D in the social sciences and humanities.

R&D data is available across counties. For our purposes, the key will be that in some cases it includes investment in software and hence this will have to be removed. This will have to be investigated. Mineral exploration and copyright and license costs are typically publicly available as part of the National Accounts. New product development costs are measured as a fractions of intermediate consumption by the financial services industry, spending on new architectural and engineering design and industries classified as social science and humanities (a National Accounts item). All of these data will have to be explored.

- *Economic Competencies*

Economic competencies in the CHS framework consists in turn of

1. company spending on reputation capital (branding etc.)
2. company spending on human capital (training etc.)
3. company spending on organisation capital

For reputation capital, there are a variety of data on advertising expenditure. Data on firm-specific training is more difficult. Typical labour force surveys of company-provided training do not ask for expenditure data but ask yes/no questions as to whether the worker received such training. Further, the cost of employer provided training is not only the costs of providing training (whether it be on courses or by other employees) but also the opportunity costs of worker's time whilst undergoing training. Both surveys in the US and UK find that the opportunity cost to the employer is about equal to the spending on providing training (buying in courses, running in house training centres). R&D surveys and so is important. The availability of training data (in terms of both direct spending and the opportunity cost) from other countries is something that the project will investigate. GH sets out some cross-country evidence on employer-provided training using two main cross country data sets, the IALS and the CVTS. So some data are potentially available, but this will need more investigation.

Turning finally to investment in organisational capital, as CHS point out, one needs to measure purchased and own account. Neither are well measured and so they use, for purchased, (a fraction of) the turnover of management consultants, on the basis that if firms are willing to pay for advice, it must be worth something to them. For own account spending, they suggest a fraction (20%) of managers' earnings. These data are obtained, in the UK for example, from micro data earnings surveys. Such surveys are conducted in other EU countries but access can be complicated and so this is clearly a research area that will have to be pursued in each country.

- *Comparison of investment across countries*

Having collected these data, we shall compare them across countries. This will be a substantial addition to knowledge. To date, we have cross-country comparisons for only a few dimensions of intangible investment, such as R&D. But, as set out above and as many have acknowledged, R&D is only part of a county's investment in intangible assets. Using our wider definitions, we can explore this. There are some international comparison of training, see for example, GH, but few that rely on consistent data on spending,

see above. Likewise, there are some comparisons of software spending, but again this is only part of intangible investment.

With these data on investment we can then proceed further.

- *Use investment data to examine the effect of intangibles on GDP, investment and labour shares, productivity growth and relative productivity levels between countries.*

The basic steps here are (a) to build capital stocks of tangible and intangible assets, (b) re-calculate real GDP and its growth, (c) recalculate the operating surplus to allow for returns to intangible assets, (d) build a Hall/Jorgenson volume index of capital services measures of all capital inputs, ensuring the asset rental payments are consistent with the adjusted operating surplus, (e) undertake growth accounting within countries, (f) compare productivity across countries and (g) carry out sensitivity analysis. This represents a formal, logically consistent way of proceeding which of course relies on a number of assumptions, all of which we shall test the sensitivity to. Note that whilst our explanation here is macro-focused, the logic of expensing intangible assets applies to the micro data too.

To set out how we shall do this, we set out some theory in the full proposal which we do not repeat here. Instead we move onto the other key aspects of our overall plan, namely sensitivity analysis, cross country levels work and micro analysis.

- *Sensitivity analysis*

The strength of this approach is that it provides a consistent measure, informed by theory, of how intangibles affect major economic variables. But such an approach, whilst logically consistent, relies on a set of assumptions with which one may be uncomfortable. One approach to this is to eschew making any assumptions at all, given the uncertainties involved. The problem then is that answering the specific questions in the FP7 call for work is then impossible, since it specifically asks to work out the effect on intangible spending on e.g. productivity. Thus it would seem a better way forward to start by making a set of (logically consistent) assumptions that enable us to try to answer the question at hand and then test the robustness of the answer to the assumptions made (in addition to then exploring micro data).

Testing the robustness of assumptions on cross-country work is complicated, but the advantage of a unified piece of software which we have developed is that this can be done systematically. At present, we only have systematic analysis of robustness using the UK data. Our main result here, in the context of the UK work, is that the results are quite robust to depreciation for example, mostly because assumed depreciation rates are so fast the main impact is from the level of expenditures. What we found there is that the levels of expenditures are critical.³ What we could not investigate very well, since we had little alternative, is the robustness to assumed deflators. Thus these are at least two areas we can plausibly explore as follows.

³ In the UK the shares of investment and wages and LPG and MFPG) are robust to changes in the depreciation rates but depend rather more on the measured investment levels. It is worth noting too, that around 60% of intangible spending comes from official surveys (e.g. the R&D survey, software investment surveys, training surveys). Note finally that there is some criticism of

Concerning deflators, we need to deflate investment to build real stocks of assets. The implications of this with respect to measured R&D are discussed in Okubo, Robbins, Moylan, Sliker, Schultz and Mataloni (2006). As they set out there are a number of ways of proceeding. The conventional approach is to deflate the cost of R&D production by a cost index, based on changes in costs weighted by their shares in production of R&D. A drawback with this approach is that it assumes zero MFP growth for the R&D process. Alternative scenarios suggested are (a) to take the index and but subtract off an assumed MFP gain, say from average MFP growth for the higher performing manufacturing industries (b) assume that the (unknown) price index for R&D is given by a weighted average of price indexes of the highest-productivity service industries (c) value R&D at the output prices of products produced by R&D-intensive industries (in the US case, radio and TV-receiving equipment; drugs and medicines; office, computing, and accounting machines; and aircraft and missiles). All this suggests methods that we can potentially experiment across countries. We may identify, from industry analysis or otherwise, the concentration of various intangible expenditures across sectors. The quality of this information will likely vary across countries. Using the EUKLEMS data we would be in a position to develop different price indices all of which we could test robustness to.

A second major problem suggested by the UK work is the correct identification of the levels of expenditure. In turn, a good deal of the problem here relates to (a) the correct identification of what constitutes intangible expenditure (e.g. have we omitted major categories), (b) measurement of own-account levels expenditure and (c) the extent to which measured intangible expenditure is on asset building rather than day-to-day expenses.

The second main thrust of sensitivity analysis will be done by looking at the micro data, see below.

- *Cross-country levels work*

This sets out the within-country analysis of intangible assets and their effect on country LPG and TFPG. Our final research question is to compare cross country levels of LP and TFP using multi-lateral productivity comparisons. To do this, we follow the approach of, for example, Caves, Christensen and Diewert (1982), also implemented in the EUKLEMS work. Rather than the comparison between time periods t and $t+k$, the comparison is between country i and either another country, for bilateral comparisons, or a synthetic country for multi-lateral comparisons. Thus the shares that weight the factor inputs are not averaged across time but across countries. Finally, data has to be converted into a comparable level using PPPs. Recent work by the EU KLEMS consortium, funded under the 6th framework program, will provide more TFP level estimates that can be used for this purpose.

The current work is highly informative for policy-makers about the sources of productivity level differences in terms of their origins in hours, skills, capital or MFP (or industry mix for disaggregated data). However, since GDP changes with the capitalisation of intangible assets, relative labour productivity will change (of course since it changes in all countries, we cannot be sure whether the ranking changes relative to the current ranking, this is a major finding that we shall produce). In addition, since we are calculating a whole set of

the use of GDP as a measure of welfare, see GHW, where it is argued that growth in GDP is still valuable information as a measure of the rise in the supply-side constraint on total welfare and is need to calculate depreciation if it is desired to subtract this.

new inputs it is of interest to understand the relative contributions of these inputs and of the new levels of MFP.

- *Micro data work and company accounts*

We consider it would be very helpful to try to relate this macro work to the micro data. The major problem is that the official statistics hardly collect information on intangibles systematically and few firms record such investments. Thus this work is, necessarily at this stage, rather more speculative. However there are a number of ways in which we might see it proceeding, all of which we shall investigate.

First, to the best of our knowledge the only systematically collected data set that collects data on a range of intangible asset spending by firms is the Community Innovations Survey.⁴ In the UK, for example, it records data on R&D, training, branding and design. There are however formidable problems with using CIS in a cross-country comparative framework, since the precise implementation of the survey differs between countries, and information on actual expenditures is often lacking. But since the CIS can be matched, in some countries at least, to the Production Census, this offers us the best chance of looking at micro data on intangible expenditures to see their possible impact on MFP and thereby assemble additional information on implied depreciation rates and the like.

Second, in their assessment of profitability, competition authorities are often faced with having to measure intangible assets, since companies frequently argue that accounting return on capital employed is distorted by the omission of intangible capital employed. For instance, the UK Competition Commission has developed a series of metrics and conventions to undertake this exercise. Interestingly, whilst developed independently of the CHS work, the broad areas that they consider mirror very closely the categories chosen by CHS. So software, ICT, training and branding are typically considered (although managerial organisational investment is not so). Thus we think it of potential interest to study what measures and conventions have been developed in different competition authorities and compare this to the macro and micro work. In turn, we hope this would help inform competition authorities.

Third, there are a number of assumptions that macro numbers are based on that could be better informed by micro estimates. For example, we do not know what fraction of managerial time is spent on building corporate organisational capital. Ultimately, such a number would have to come from a carefully conducted time-use survey with all the attendant problems of questionnaire design, non-response and single-rater bias. That would be require another (well-funded) project and so our aims here would be necessarily more modest. Using our contacts, we would talk more to companies to give us a better idea of some of these numbers. Our interviews would be focused on a quantitative assessment of what companies spend on intangible asset building which ultimately would inform what systematic questionnaires could be designed, or how the many existing questionnaires could be used or altered. Such exploratory but focussed interviews have proved, in the past, to be quite successful e.g. the work of Dougherty et al (2004) at The Conference Board in understanding R&D deflation across countries within multi-nationals.

⁴ There is another survey carried out in 2002 by the UK Design Council which emphasises design and marketing expenditures but also collects R&D expenditure. The Council have kindly supplied us with these data and this can be explored.

Finally, whilst companies typically acknowledge spending on intangibles to be central to the dynamism and future of their businesses, some are reluctant to capitalise such spending since much of it is uncertain. At a macro level, the law of large numbers means that one might be more willing to undertake such a calculation. This suggests that the macro numbers might be a useful benchmark for individual companies to inform how they might undertake some capitalisation. Thus the macro numbers can likely inform micro estimates. To take this forward, one can work with financial information from business. For example, on the basis annual income statements, expenditures (e.g. on R&D) that are clearly intended to increase future income are not treated as a cost but as an investment. The new capital item then needs to be depreciated, and other items, such as the part advertising budget designed to launch new products and gain market share, then added. There are of course a host of other complications, prices etc. and hence we think it potentially of interest to go to firms and try to develop a set of metrics to help business measure and evaluate intangibles.

Using the accounting model established in CHS (and the other studies discussed above) as a guide, an attempt will be made for this project to restate the financial statements of a range of European corporations to include a broad range of intangibles. The goal is to develop the restated income statements and balance sheets into a time series that is long enough to assess the effect of intangibles of company performance. Care will be taken to select companies in high-technology industries like the pharmaceutical and information sectors, as well as firms in the retail and financial industries, and, for comparison, a collection of lower growth industries like autos.

Preliminary work by The Conference Board on the balance sheets and income statements of Merck and Microsoft indicates that the capitalisation of intangibles on the basis of company accounts is feasible. However, the preliminary work also uncovered areas in which more information is needed to improve the accuracy of the estimates (for example, the write-off periods over which intangibles are amortized, spending on human resource development and long-term strategic planning). Additionally, considerable effort will be required to develop a consistent time series, in light of the mergers and acquisitions that take place over time, and accounting changes like the recognition of employee stock options. These are challenging data problems, made all the more difficult by the fact that intangibles are not recognized on corporate financial statements, and because surveys of corporate leaders has revealed some confusion about the nature of intangibles. However, the consortium is uniquely positioned to make progress in this area, given its experience in dealing with these issues at macro level and the close ties of one of its partners, The Conference Board, to corporate leadership and the resulting potential to look behind the numbers reported on the published financial statements.

- *How will this strategy lead the participants to achieve the objectives of the project?*

The aims of the project are to better understand the contribution of intangibles to EU productivity levels and growth. The prime requirement to do this is to gather data. This is what the above plan will do and this is then how it will contribute to project objectives.

- *Significant risks and contingency plans*

The risks and contingency plans can be described in relation to our macro and micro data.

a. macro data.

As discussed above, we shall have to look for cross-country data availability. Let us omit Bulgaria for the moment. We know that cross-country data exists for quite a number of headings, since they are national accounts items. So we will have data for software, scientific R&D, mineral exploration and copyright and licence costs. We also have industry data across countries for financial services and design. Therefore what is less certain is branding, training and organisational capital. Branding uses advertising data, which is collected in a variety of different ways in countries, by advertising associations and by official data. In the UK both those data collection methods give the same figure. Thus we are very confident that at least one of these methods will exist in each country. Likewise training surveys vary, but there are at least some harmonised ones such as CVTS so again, we are very confident these data exist. Lastly, organisational capital uses microdata on managerial wages and salaries. Such data do exist, since each of our countries has micro labour data. The slightly complicated question here will be getting access to these data but we are again confident that we can do this. On the macro side then, all this leaves the question open of Bulgaria. Thanks to its centrally planned past, Bulgaria has extremely detailed company-level data, both before and after reform. Our team member has these data and the data are very detailed. It is fair to say that we have not yet investigated these data fully.

b. micro data.

This is an area where the data are rather less certain, as we discuss on p.15-16. We know that we already have the CIS in all countries (bar Bulgaria). We also have additional micro data sets in the UK, in France and for a number of multi-nationals via the Conference Board. So part of the project will be to scope what we do and do not have. At this stage we are fairly confident that the likelihood of having no micro data in a country is very low. But it might be that some countries will have to work more on the macro data, or perhaps on datasets of another country better provided than them with data.

c. work performance

There is also a small risk to the work performance of the project through delayed pre-financing to the partners, and variances in the actual start date by each partner.

B.1.3.2 Timing of work packages and their components

Graphical presentation of work packages

Start date of each workpackage is relative to start month of each partner

Work Number	Package	Deliverable Number	Month, 1-30														
			2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
1	1	1	█														
2	2	2		█	█												
3	3	3			█	█	█										
	4	4			█	█	█										
	5	5			█	█	█										
	6	6			█	█	█										
	7	7			█	█	█										
	8	8			█	█	█										
	9	9			█	█	█										
4	11	11						█	█	█	█	█					
5	12	12														█	█
6	13	13														█	█
1 – 6 (Overall)	14	14														█	█
7	15	15	█														
	16	16	█			█							█			█	
	17	17											█				
	18	18															█
	19	19															
	20	20															
	21	21															
22	22																

B.1.3.3**Work package list****Work package list**

Work package No ⁵	Work package title	Type of activity ⁶	Lead beneficiary No ⁷	Person-months ⁸	Start month ⁹	End month ¹⁰
1	Scoping for other countries	RTD	8	7	1	8
2	Cross-section estimates of intangible assets for whole economy	RTD	8	21	2	8
3	Pan-European time-series analyses for whole economy	RTD	8	28	9	12
4	Within-country analyses for whole economy	RTD	1	35	19	22
5	Cross-country analysis of productivity levels incorporating intangible assets for whole economy plus analysis of industries	RTD	1	21	23	30

⁵ Workpackage number: WP 1 – WP n.

⁶ Insert one of the following 'types of activities' per WP (only if applicable for the chosen funding scheme – must correspond to the GPF Forms):

RTD = Research and technological development including scientific coordination applicable for collaborative projects and NoEs

DEM = Demonstration - applicable for collaborative projects

OTHER = Other activities (including management) applicable for collaborative projects, NoEs, and CSA

MGT = Management of the consortium - applicable for all funding schemes

COORD = Coordination activities – applicable only for CAs

SUPP = Support activities – applicable only for SAs

⁷ Number of the beneficiary leading the work in this work package.

⁸ The total number of person-months allocated to each work package.

⁹ Relative start date for the work in the specific work packages, month 1 marking the start date of the project, and all other start dates being relative to this start date.

¹⁰ Relative end date, month 1 marking the start date of the project, and all end dates being relative to this start date.

COINVEST Description of Work

6	Exploration of micro-data	RTD	1	63	18	30
7	Management	MGT	1 & 8	19	1	30
	TOTAL			194		

B.1.3.4 Deliverables List

List of Deliverables – to be submitted for review to EC¹¹

Del. no. ¹²	Deliverable name	WP no.	Lead bene-ficiary	Estimated indicative person-months	Nature ¹³	Dissemination level ¹⁴	Delivery date ¹⁵ (proj. month)
1	A pan-European scoping of exemplar countries to determine nature of intangible investments	1	QMUL	7	R	PU	8
2	Using data from the above scoping exercise, a paper that provides cross-section estimates of intangible assets for all countries represented in the consortium	2	QMUL	21	R	PU	8
3	Paper quantifying figures on time-series estimates	3	QMUL	3	R	PU	12

¹¹ In a project which uses 'Classified information' as background or which produces this as foreground the template for the deliverables list in Annex 7 has to be used

¹² Deliverable numbers in order of delivery dates: D1 – Dn

¹³ Please indicate the nature of the deliverable using one of the following codes:

R = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

¹⁴ Please indicate the dissemination level using one of the following codes:

PU = Public

PP = Restricted to other programme participants (including the Commission Services)

RE = Restricted to a group specified by the consortium (including the Commission Services)

CO = Confidential, only for members of the consortium (including the Commission Services)

¹⁵ Month in which the deliverables will be available. Month 1 marking the start date of the project, and all delivery dates being relative to this start date.

	dating back to 1980 for the United Kingdom						
4	Paper quantifying figures on time-series estimates dating back to 1980 for Sweden	3	IFN	3	R	PU	12
5	Paper quantifying figures on time-series estimates dating back to 1980 for Bulgaria	3	CLUB2000	3	R	PU	12
6	Paper quantifying figures on time-series estimates dating back to 1980 for Germany	3	ZEW/ TCBE	3	R	PU	12
7	Paper quantifying figures on time-series estimates dating back to 1980 for Portugal	3	IST	3	R	PU	12
8	Paper quantifying figures on time-series estimates dating back to 1980 for France	3	CNRS-GRECSTA/TCBE	3	R	PU	12
9	Database comprising the figures produced for cross-section estimates to 2005 and time-series estimates dating back to 1980 for all countries	3	QMUL	7	R	PU	18
10	Paper providing a	4	IC	35	R	PU	22

	within-country analysis of intangible assets and investments at sector-level and the level of the enterprise allowing for specific countries with the data						
11	Major cross-country analysis comprising pan-European overview of the effects of intangible assets and investment on European competitiveness and innovation	5	TCBE	21	R	PU	30
12	A taxonomy of quality indicators and measurements for the assessment and valorisation of intangible assets and investments based on micro-data work	6	IC	21	O	PU	30
13	Based on the above work, a distillation of the findings of the above work culminating in the country-specific micro-data exercises, leading to a drafting and publication of report	1 – 6	IC	42	R	PU	30
14	Organisation and execution of the opening meeting in	7	QMUL	1	O	PU	3

	Brussels.						
15	Organisation and execution of the Steering Committee meetings.	7	QMUL/ IC	1	O	PU	1, 8, 13, 22
16	Organisation and execution of the mid-term review meeting in Paris	7	QMUL	1	O	PU	13
17	Organisation and execution of the final academic conference in Lisbon.	7	IC	1	O	PU	24
18	Organisation and execution of a policymaker briefing in Sofia.	7	IC	1	O	PU	27
19	Distillation of above to formulate best practice in policy-orientated report for the development of tools to accurately assess and measure the impact of intangible assets and investments and that, furthermore, can lead to improving policies aimed at their promotion.	7	IC	6	R	PU	30
20	Organisation and execution of the final policy and dissemination meeting in London.	7	IC	1	O	PU	30
21	Drafting and publication of Final	7	IC	6	R	PU	30

COINVEST Description of Work

	Report						
22	Six monthly progress reports together with policy findings, if any	7	QMUL/IC	1	R	PU	7,13,19, 24 and 30
				194			

B.1.3.5 *Description for each work package*

Work package number	1	Start date or starting event:						1
Work package title	Scoping for other countries							
Activity Type	RTD							
Participant number	1	2	3	4	5	6	7	8
Person months per participant:	0	1	1	1	1	1	1	1

Objectives

- To scope the availability of data on intangible assets for our countries and other countries too
- Develop guidelines for harmonization of the data across countries with the aim of establishing consistent definitions
- applicability of data to all other Member States and Associated Countries

Description of work (possibly broken down into tasks), and role of participants

This part of the project will be a preliminary scoping exercise to check on what sources of data are available from each country involved. We expect, however, that there will be substantial interest from other countries. The OECD has already indicated great interest elsewhere. So whilst we cannot fund other countries, there may be other country interest and we are hopeful that we can incorporate other countries into the picture.

The specific tasks for the macro work follow the three headings for intangible assets, set out in the proposal above:

- computerised information (mainly software),
- innovative property (mainly scientific and non-scientific R&D) and
- firm competencies (company spending on the following dimensions of capital: reputation, human and organisational capital).

On (i), most of these data are already collected under the EUKLEMS project but we will have to be careful to review the collection and interpretation of the data for these purposes. Note that the leader of

that project, Bart van Ark, is closely involved with this project and so we shall expect to be able to integrate that work and this using his expertise. On (ii), most countries have scientific R&D data collected according to Frascati rules, but again it would be a case of checking how this is done and what cross-country problems and issues there might be. With regard to non-scientific R&D, this is much harder and UK and US existing studies have used a mix of data on design and use of intermediates in financial services. These are taken from National Accounts and so should be available. One issue to be explored is availability from Bulgaria; including an Eastern European country is valuable, since the original structure is likely to be highly non-intangible intensive and the change in its structure an open question. We have very detailed Production Census data here before and after reform. Finally, on (iii), this requires some work. Cross-country data on training, as discussed above is patchy but with the combination of pre-existing OECD work and country-specific knowledge, we are hopeful that we can examine this question consistently. Spending on organisational capital requires micro-data in each country which is available but would need some care and checking for consistency.

We shall also look at the feasibility of collecting data broken down by industry. We would look initially at collecting data for the market sector since outputs and inputs for the government sector are so hard to measure. If we can breakdown the market sector into manufacturing and services, or perhaps even further, this would be valuable.

The second set of tasks at this stage is to review micro-data sources for possible future work on the assumptions underlying intangibles or the development of metrics. This will continue throughout the project as new questions and methods are raised.

The role of each participant will be to provide information on the data available in their country in line with as consistent a set of guidelines as possible. Each participant has access to and experience of either the county-specific micro-data or the macro data or both. The Portuguese (IST) partner for example has access to the matched employee-employer micro-data for the whole economy of their country.

Deliverables (brief description and month of delivery)

- Deliverable 1: A pan-European scoping of exemplar countries to determine nature of intangible investments

Each country will deliver a comprehensive summary of findings per country by the end of the Month 1 on the data sources, consistency and time series availability. As the work develops, this will evolve as we collect data to consistent definitions. Therefore we would propose developing an internet-portal, as has been done on current research work, for each country to log in and update the details of each individual series that they are collecting. Such a portal, which will use our existing CeRiBA website (www.ceriba.org.uk) will be on an interactive 'Wiki' basis for maximum flexibility and interaction (for example, in our current set-up whenever a country places new data on the database, an automatic email is automatically sent to other participants). Initially each country participant will have their own password but subject to confidentiality, we would hope to release the data across countries.

Work package number	2		Start date or starting event:		Month 2			
Work package title			Cross-section estimates of intangible asset investment					
Activity Type			RTD					
Participant number	1	2	3	4	5	6	7	8
Person months per participant:	0	3	3	3	3	3	3	3

Objectives

- To develop estimates for the most recent year possible of investment in intangible assets by each country.
- To compare and contrast countries to see in what intangible assets areas they invest most

Description of work (possibly broken down into tasks), and role of participants

This work shall proceed by collecting data on the asset types set out above. We then examine cross-country differences. We believe this will be of great interest and so far has only been done in a piecemeal fashion. For example, there are many comparisons of R&D, in the sense of scientific R&D. One fact underlying the Lisbon agenda on boosting R&D for example, is the finding that EU R&D is typically less than US R&D. However, an important theme of this project is that scientific R&D is but one part of all types of R&D and so we think it important to gather data on more topics. There are also comparisons of investments in ICT but again, this is but one type of R&D. So, we would aim here to produce a more complete picture of the comparative quantity of investment in all the dimensions of “broad” R&D that firms do. The explanation of such differences is of course a subject for more work that we shall look at. For example, one preliminary finding in the UK/US work that we have done is that whilst the UK is weak on scientific R&D, it is much stronger on non-scientific R&D (mostly financial-institution related). This may be related to the externalities from the UK having the City of London, although the US has at least one financial cluster in New York. Comparison with other EU countries would be most interesting.

As above, the role of each participant will be to gather data consistently in order to make a comparison.

Deliverables(brief description and month of delivery)

- Deliverable 2: To keep matters simple, each country will contribute to the cross-section work by the end of Month 8, again using the internet facilities set out above. The cross-country work will be a joint output of all countries.

Work package number	3		Start date or starting event:			Month 9		
Work package title			Pan-European time-series analysis					
Activity Type			RTD					
Participant number	1	2	3	4	5	6	7	8
Person months per participant:	3.5	4	4	4	4	4	4	0.5

Objectives

- To develop estimates for as long a time-series as possible of investment in intangible assets by each country.
- To compare and contrast countries to see in what intangible assets areas they invest most and how this has changed.
- To generate the time series to then fit into the growth accepting programme (as per the next work stream)

Description of work (possibly broken down into tasks), and role of participants

This work follows naturally from the cross-section work above, since it tries to develop time-series to look at how investment has changed over time. We shall try to start in 1980, but the data in different countries is likely available for various time periods and we shall have to explore this. As above, we shall also look at the time series possibilities by industry. As above, the role of the participants will be to gather data consistently in order to make a comparison.

The second task will be to examine cross country time series differences. Again, we believe this would be of very great interest.

Deliverables (brief description and month of delivery)

Deliverables 3 -9 inclusive

- A paper quantifying figures on time-series estimates dating back to 1980, and where possible 1970, for each country represented in the consortium.
- A database comprising the figures produced for cross-section estimates to 2005 and time-series dating back to 1980, and where possible 1970, for all countries.

We are currently not sure that Bulgaria can go back to 1980, so shall investigate this. Once again, to keep matters simple, each country will deliver one report per country on the time series, by the end of Month 9. The cross-country work will be a joint output of all countries.

Work package number	4	Start date or starting event:						Month 18	
Work package title	Within-country analysis								
Activity Type	RTD								
Participant number	1	2	3	4	5	6	7	8	
Person months per participant:	5	5	5	5	5	5	5	0	

Objectives

- To use the data collected above to examine within country output and how the capitalisation of intangibles affects the calculation of output.
- To use the data collected above to explain their contributions to within-country output, and how the inclusion of intangibles affects the explanation of how country wealth grows.
- To compare and contrast these findings across countries

Description of work (possibly broken down into tasks), and role of participants

This work follows naturally from the time-series work and will consist of the following tasks. First, for consistency, if we are treating intangible expenditure as investment and not intermediate expenditure, then it will have to be included in gross value added and this will have to be done by country. Second, if each intangible is an investment expenditure leading to an asset, the asset level has to be calculated which, as explained above, will be done using the perpetual inventory method. Third, we wish to account for the contributions of each intangible to the new output that we generate. We shall do this by growth accounting, As discussed above, to do this we have to develop volume indices of capital services. Fourth, we have to examine the robustness of these findings All as set out above. Finally, we can then analyse cross-country differences in growth rates and the proximate reasons for such differences.

All this will be done, as explained above, in a consistent fashion using the already-developed computer code that does this for the UK. Each participant will of course be given the chance to improve the code, but at the moment, the code does all of the above once time series data on outputs and inputs is provided.

In this way, we hope to be able to analyse the data consistently, and we can also, for example, change the depreciation rates or feed in new deflators in consistent fashion.

Again, we believe this would be of very great interest. In the UK for example, the inclusion of intangibles into output and also as an additional asset, changes the path of output growth per head and TFP growth.

The role of each participant will be to comment on the code, so that it is internationally agreed, implement it on their data and report on the findings accordingly.

Deliverables (brief description and month of delivery)

- Deliverable 11: A joint paper providing a within-country analysis of intangible assets and investments at sector-level and the level of the enterprise for the each country represented in the consortium. This will be supported by a computer program that will be written to produce formulae for the calculation of rates of intangible investment and assets at country-level and sector-level based on within-country analyses and to help establish their effects.

Work package number	5	Start date or starting event:						Month 23	
Work package title	Cross-country analysis of productivity levels incorporating intangible assets								
Activity Type									
Participant number	1	2	3	4	5	6	7	8	
Person months per participant:	3	3	3	3	3	3	3	0	

Objectives

- To analyse cross-county productivity levels and the proximate reasons for their differences using the new output levels from the capitalisation of intangibles and the new input levels from the additional intangible asset input
- To create new software to establish relative productivity calculations
- To determine whether including intangibles has a bearing on the relative performance picture and the extent of the use of intangibles on a country-by-country basis.

Description of work (possibly broken down into tasks), and role of participants

This work sets out to build on current influential work documenting the productivity level differences between countries and their proximate causes due to differences in inputs. However, since the inclusion of intangibles affects both outputs and inputs there is a fascinating question of how the picture might change. Thus the tasks here are as follows. First, we shall write new software to undertake relative productivity calculations, based on the multi-lateral comparison work of, for example, Caves, Christensen and Diewert (1982), also implemented in O'Mahony and De Boer (2002). Second, once this is done, we shall disaggregate relative outputs into relative inputs. This will allow us to better understand whether including intangibles changes the relative performance picture and to what extent use of intangibles by different countries contributes to this.

The role of each participant will be to contribute to the improved compute code and provide their data to enable the comparisons to be made. We shall also require the development of PPPs.

In addition, we shall try to collect data industry by industry and then conduct the work set out above. This is rather more speculative however for the following reasons. First, in the CHS method a number of expenditures are derived from industry spending data. For example, it is assumed that spending by companies on design is a fraction of overall sales of the design industry in a country. Whilst this might give a guide to the overall figure, it is clearly inadequate for estimating the industry-by-industry figure since one does not know the industry from which the spending originates. Thus other methods have to be used, such as input/output tables or occupation analysis. Thus this will have to be explored for different countries. Second, there are some tricky definitional issues when dealing with industries. When a retail company advertises cheap drinks for example, it is not obvious whether that builds the reputational capital of the retail industry or the drinks industry. Thus we shall have to examine these issues and arrive at a standard for cross-country work so that the data is compiled in a consistent way. Then, data allowing we shall analyse growth and productivity levels using the additional insights from industry data.

Deliverables (brief description and month of delivery)

Deliverable 12: Major cross-country analysis comprising pan-European overview of the effects of intangible assets and investment on European competitiveness and innovation

This will be a joint output since it compares all countries to be completed by end of Month 16.

Work package number	6	Start date or starting event:						Month 24	
Work package title	Exploration of micro-data								
Activity Type	RTD								
Participant number	1	2	3	4	5	6	7	8	

Person months per participant:	9	9	9	9	9	9	9	0
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Objectives

- To analyse micro-data within and across countries, depending on the advantages in each country to shed light on a variety of assumptions underlying the macro work and to see if a similar exercise on the micro-data gives consistent answers with the macro data.
- To determine the impact of intangible expenditures on TFP
- Establish metrics for measuring tangibles of value to companies
- To develop a systematic questionnaire to help form a quantitative assessment of what companies spend on intangible asset building

Description of work (possibly broken down into tasks), and role of participants

This work will be the most labour-intensive work package and will develop depending upon what questions will arise in the course of the more aggregated work and upon what surveys are available to us. It will also depend on how the macro data proceeds. As mentioned above, the work can be anticipated in the following broad areas. First, to the best of our knowledge the only systematically collected data set that collects data on a range of intangible asset spending by firms is the Community Innovations Survey (in the UK, for example, it records data on R&D, training, branding and design). Matching these data with Production Census data would give the consortium the chance to look at micro data on intangible expenditures to see their possible impact on TFP.

Second, competition authorities often measure intangible assets in their assessment of profitability. For instance, the UK Competition Commission has developed a series of metrics and conventions to undertake this exercise, most notably in recent banking cases for example. Thus we think it of potential interest to study what measures and conventions have been developed in different competition authorities and compare this to the macro and micro work.

Third, the Conference Board has already undertaken some exploratory work on using financial information from business to develop some metrics for measuring intangibles and their value for companies to use. This provides a potentially interesting bridge to company work.

Fourth, there are a number of assumptions that macro numbers are based on that could be better informed by micro estimates. For example, we do not know what fraction of managerial time is spent on building corporate organisational capital. Using our business contacts, we would talk more to companies to give us a better idea of some of these numbers. Our interviews would be focused on a quantitative assessment of what companies spend on intangible asset building which ultimately would inform what systematic questionnaires could be designed, or how the many existing questionnaires could be used or altered.

The role of each participant will be to contribute to each possible project bringing to bear different micro-data and comparing them where possible.

Deliverables (brief description and month of delivery)

Deliverables 13 and 14.

- A taxonomy of quality indicators and measurements for the assessment and valorisation of intangible assets and investments based on micro-data work
- Based in the above work, a distillation of the findings from the above work culminating in the country-specific micro-data exercises, leading to drafting and publication of a report

Work package number	7	Start date or starting event:						Month 1	
Work package title	Management								
Activity Type	MGT								
Participant number	1	2	3	4	5	6	7	8	
Person months per participant:	7.35	1	1	1	1	1	1	5.65	

Objectives

- To manage the overall activities of the consortium working on the project
- To facilitate effective decision-making and dissemination which is vital in such a widely-dispersed consortium
- To provide opportunities for consultation and discussion with policy-makers, and external academics, to ensure that the project maintains its policy focus and academic rigour.

Description of work and role of participants

The work will have the overall task of trying to deliver high quality output on time and on budget. The particular subtasks involved will include: the co-ordination of work across countries, the writing of software to facilitate such work, the developments of micro-data projects, the arrangement of conferences and meetings to smooth along such work, keeping an overall view of the policy and related demands on the outcomes of the project.

Queen Mary, University of London (QMUL) will act as the project (chief administrative) co-ordinator and take responsibility for the management of the project for the first 12 months of the project, after

which Imperial College of Science and Technology (IC) will assume these responsibilities. The project administration and management will be carried out under the direction of Professor Haskel, who will be the Project Scientific Co-ordinator. In particular, QMUL (IC from month 13) will:

- Act as principle contact between project participants and the Commission
- Administer the project and facilitate its implementation at all levels.
- Co-ordinate the process of reporting on project progress to the Commission
- Organise all seminars, conferences and bilateral meetings (with the exception of the one policy briefing in Sofia, Bulgaria to be organised in conjunction with Club Ekonomika 2000 team)
- Initiate the dissemination of the projects research results

A Steering Committee will be set up to provide a strong oversight structure, which will be vital in coordinating the activities of the widely dispersed research consortium. The Committee will comprise the Scientific Co-ordinator, the team leader of each participating institution, and four external experts on national and international economic, statistical and accounting analysis.

Deliverables (brief description and month of delivery)

Deliverables 15 to 22 inclusive.

Deliverables will be management services and input throughout the project period, based on the organisation of meetings and the publication of one policy paper and one Final Report..

- Organisation and execution of the opening meeting in London in month 1.
- Organisation and execution of the Steering Committee meetings in months 8, 13 and 22.
- Organisation and execution of the mid-term review meeting in Paris in month 13.
- Organisation and execution of the final academic conference in Lisbon in month 24
- Organisation and execution of the final policy and dissemination meeting in London in month 30.
- Organisation and execution of a policymaker briefing for practitioners in newer Member States and Associated Countries in Sofia in month 27.
- Distillation of all results to formulate best practice in policy-orientated report for the development of tools to accurately assess and measure the impact of intangible assets and investments and that, furthermore, can lead to improving policies aimed at their promotion in month 24.
- Drafting and publication of Final Report in month 30
- Six monthly progress reports (5 to 10 pages) together with policy findings, if any.

B.1.3.6 Efforts for the full duration of the project

Template: Project Effort Form 1 - Indicative efforts per beneficiary per WP

Project number (acronym): 217852 (COINVEST)

<i>Work package</i>	WPP1	WPP2	WPP3	WPP4	WPP5	WPP6	WPP7	TOTAL per Beneficiary
IC	0	0	0.5	5	3	9	7.35	24.85
TCBE	1	3	4	5	3	9	1	26
CSE	1	3	4	5	3	9	1	26
CLUB2000	1	3	4	5	3	9	1	26
IST	1	3	4	5	3	9	1	26
ZEW	1	3	4	5	3	9	1	26
CNRS-GRECSTA	1	3	4	5	3	9	1	26
QMUL	1	3	3.5	0	0	0	5.65	13.15
TOTAL	7	21	28	35	21	63	19	194

COINVEST Description of Work

Project Effort Form 2 - indicative efforts per activity type per beneficiary

Project number (acronym): 217852 (COINVEST)

<i>Activity Type</i>	IC	TCBE	CSE	CLUB2000	ZEW	IST	CNRS-GREC STA	QMUL	TOTAL ACTIVITIES
RTD/Innovation activities									
Scoping for other countries	0	1	1	1	1	1	1	1	7
Cross-section estimates of intangible assets for whole economy	0	3	3	3	3	3	3	3	21
Pan-European time series for whole economy	0.5	4	4	4	4	4	4	3.5	28
Within-county analyses for whole economy	5	5	5	5	5	5	5	0	35
Cross-country analysis of productivity levels	3	3	3	3	3	3	3	0	21
Exploration of micro-data	9	9	9	9	9	9	9	0	63
Total 'research'	17.5	25	25	25	25	25	25	7.5	175

Consortium management activities									
Management	5.65	1	1	1	1	1	1	7.35	19
Total management	5.65	1	1	1	1	1	1	7.35	19

TOTAL BENEFICIARIES	9.65	26	26	26	26	26	26	28.35	194
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B.1.3.7 List of milestones and planning of reviews

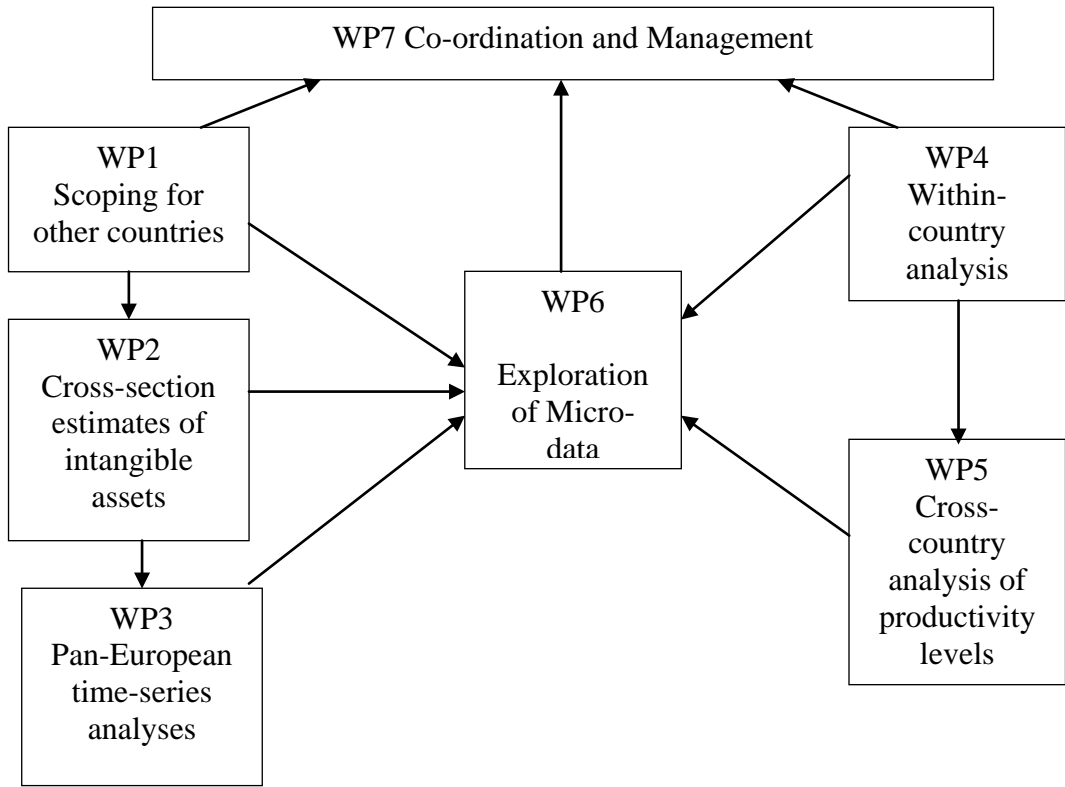
List and schedule of milestones					
Milestone no.	Milestone name	WPs no's.	Lead beneficiary	Delivery date from Annex I ¹⁶	Comments
1	Opening meeting, London	7	QMUL	1	Meeting
2	Steering Committee meeting	7	QMUL	1	Meeting
3	Steering Committee meeting	7	QMUL	7	Meeting
4	Mid-Term Review, Paris	7	QMUL/IC	13	Meeting
5	Steering Committee meeting	7	IC	13	Meeting
6	Computer program for calculating rates of intangible investment	4	IC	14	New computer program produced
7	Steering Committee meeting	7	IC	24	Meeting
8	Final policy conference, London	7	IC	30	Meeting

¹⁶ Month in which the milestone will be achieved. Month 1 marking the start date of the project, and all delivery dates being relative to this start date.

COINVEST Description of Work

9	Final academic conference, Lisbon	7	IC	24	Meeting
10	Practitioners' briefing for newer Member States and Associated Countries, Sofia	7	IC	27	Meeting
11	Policy paper based on micro-data work and company surveys	7	IC	30	A taxonomy of quality indicators and measurements and systematic questionnaire based on companies' analysis
12	Final Report	7	IC	30	Publication

OVERVIEW OF PROJECT WORK PACKAGES



B2. IMPLEMENTATION

B.2.1 Management structure and procedures

The organisation and administration of the project is described below. Essentially, although one participating institution will be assigned the responsibility for organising each work package where this is possible, a Steering Committee will be created to oversee the design and implementation of all of the packages. Moreover, meetings at half-yearly intervals during the 24-month timetable for this project will provide an opportunity for external stakeholders—including the European Commission—to offer on-going commentary and advice.

B.2.1.1 *Steering Committee*

The research consortium proposed here is widely dispersed, and a strong decision-making structure is needed in order to ensure that participants' work is properly co-ordinated and the project's objectives delivered in accordance with the contract and on time. A project of this size and a large group of participating organisations requires a clear management and co-ordination structure. Given the organisation of the research a Project Steering Committee will be formed under the direction of the Scientific Co-ordinator (Professor Haskel) and the Deputy Scientific Co-ordinator, Professor Bart van Ark. In addition the financial department of the co-ordinator (QMUL for months 1-12; IC thereafter) will provide assistance for the financial management of the project. The Steering Committee will thus comprise:

- the Scientific Co-ordinator (Professor Haskel);
- the Deputy Scientific Co-ordinator (Professor van Ark);
- the team leader of each partner institution;

Note that this committee will comprise some of the world experts on data and investment intangible assets, notably Professors Charles Hulten, Jacques Mairesse and Bart van Ark. This committee will provide scientific excellence to the management of the project but also reflect both an interdisciplinary and an inter-sectoral approach to the overall research programme. Although Charles Hulten is typically based in the United States, he will advise the consortium through his position at the Europe office of The Conference Board in Brussels in order to ensure that the level of research in this area compares favourably and (where possible) exceeds that undertaken in the US.

The Steering Committee will be chaired by Professor Haskel as the scientific co-ordinator. The Committee will be responsible for the academic overview of the project and for monitoring progress, making strategic decisions relating both to the research and to its dissemination, and for ensuring effective communication among the participating institutions.

To help the Committee, the consortium will establish an *External Advisory Committee* with a strong involvement from outside academia to ensure the project keeps itself relevant to the policy and statistical

arena. Members of that board have international experience that they can bring to bear on the project. That board will consist of Tony Clayton, Director of Economics at the UK Office of National Statistics, Ian McCafferty, Chief Economist at the UK Confederation of British Industry and Yoshi Tojo, Head of Economic Analysis at the OECD. We shall also include Professor Eric Bartelsman of the Free University of Amsterdam since he is additionally the world expert in comparative micro data work, as well as being an expert in productivity and National Income accounting in his own right. All of these have agreed to participate in and provide support to the project in this capacity.

B.2.1.2 Work Package Management

To ensure that the project fulfils all sections of the work packages on time, each work package will be led by different teams based on the relevance of their expertise to the work package and, where possible, providing an intersectoral dimension (that is providing a reasonable balance of academic and non-academic led work packages). It will be their responsibility to ensure that work is done to schedule and on budget. By allocating each responsibility to a specific person, co-ordination and monitoring problems that can often occur within international projects are more easily overcome.

B.2.1.3 Project Administration

Queen Mary, University of London is the Project Co-ordinating institution for the first twelve months of the project, after which it is proposed that Imperial College of Science, Technology and Medicine, assumes this role (due to Professor Haskel's transfer there which was effective from 1st October 2008). Professor Haskel will oversee the project as its Scientific Co-ordinator while he will be assisted by a part-time project administrator with appropriate administrative experience. In order to enhance the Scientific Co-ordinator's accountability to the rest of the consortium and support him in overseeing the project, Professor van Ark will act as deputy co-ordinator due to his previous EC project co-ordination experience. This deputy post is required due to the scale and complexity of the project. In his role as Scientific Co-ordinator, Professor Haskel will have overall responsibilities for the day-to-day operation and monitoring of the project through regular contact with the partners, ensuring that the project's programme of work, milestones and deliverables are achieved as per the contract established with the Commission; and deviations resolved and recorded with change control;

Specifically, QMUL (and IC from month 13) as the Project Co-ordinator will

- Act as the interface with the Commission for all matters associated with the project, both technical and administrative;
- Inform the Commission of any slippages or necessary amendments to the work plan as soon as possible;
- Liaise regularly through meeting and electronic mail with the WP Leaders;
- Co-ordinate the preparation and distribution of all deliverables;
- Submit all reports (project management and financial) on behalf of the project consortium to the Commission on time;
- Maintain accurate records of costs, resources and staff time spent associated with the project;

- Ensure the project achieves its deliverables and technical objectives;
- Ensure the project maintains its relevance within the aims and scope of the Programme;
- Arrange for the preparation of necessary project review documentation to be submitted to the Commission and arrange with the members of the consortium for its presentation;
- ensure signature of contracts by all the contractors;
- disburse the funds from the EC and allocate them to the participants according to the agreed financial budget;
- keep overall view of the project accounts and ensure that reports to the EC are submitted on time.

Each **partner institution** will ensure that

- all work is carried out and monitored;
- all required information is provided by the deadline required;
- members of its team will actively participate in all project events;
- they avoid and advise of incompatible commitments as soon as these are known.

The Scientific Co-ordinator will require support from a **Project Administrator**, who would be employed by QMUL on a part-time basis for the first sixteen months and will move to IC in month 17. Her duties will include day-to-day project management; maintaining regular contact with the EC and all the partners; setting up and regularly updating the project's webpage; organising any project-wide communications (e.g. newsletters) and meetings; financial monitoring; facilitating reports to the EC and helping the co-ordinator in the smooth running of the network.

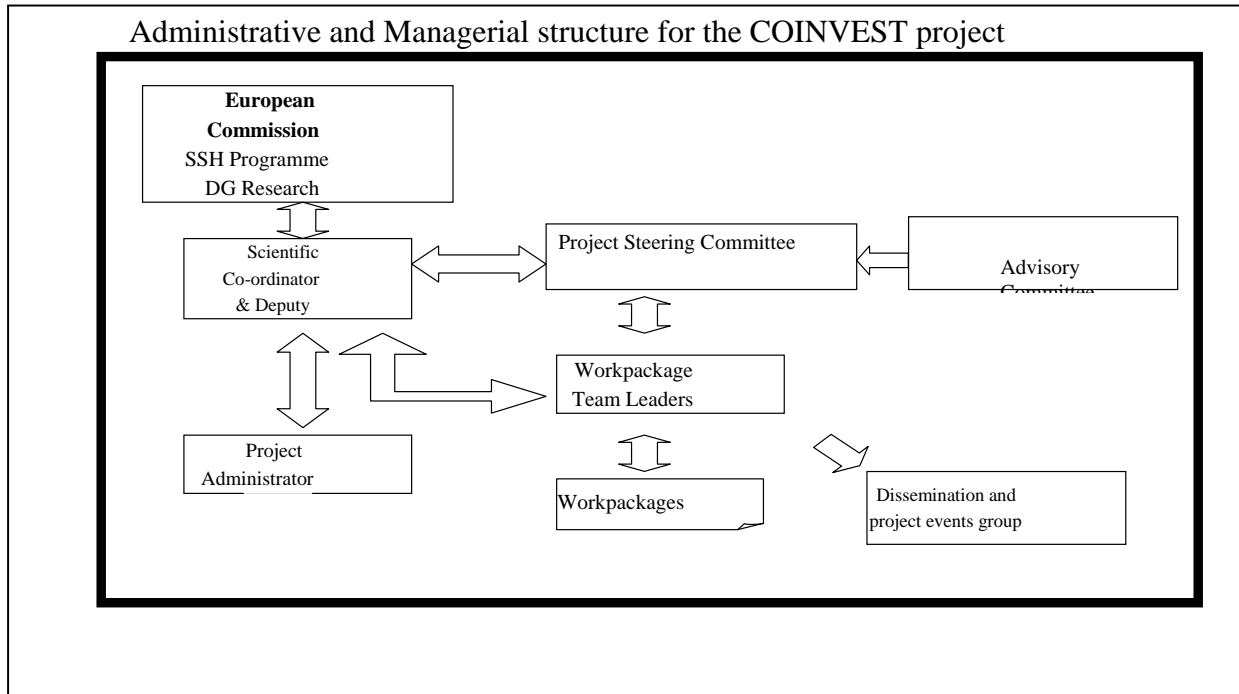
QMUL has extensive experience in managing research projects and international networks and will draw on the considerable experience it has gained in providing a common set of services for its researchers. It is currently the Project Co-ordinator of six FP6 projects, all of which are multi-contractor –based projects, ranging from a Marie Curie Research Training Network comprising 12 participants to a Network of Excellence consisting of fourteen partners with a budget of over €5 million. It has a dedicated Research Grants Administration Office, which is responsible for the disbursement of EC grant monies to partners and the submission of financial statements and other reports to the Commission, in which it has extensive experience; it will also provide support and advice to both the Scientific Co-ordinator and Project Administrator in their day-to-day management of the project. IC also has an excellent track-record in co-ordinating EC-funded projects under all Framework programmes, including the present FP7 and is thus suited to assuming the mantle of project co-ordinating institution from month 13. IC has a dedicated EU team, based in the Research Contracts team in the Research Office. The role of the EU team is to act as a source of specialist advice, information and support on all pre-contractual aspects of FP7.

As has been mentioned above, QMUL & Imperial College London in its role as project co-ordinator will need some of the management costs budget to employ (on a part-time basis) a Project Administrator with appropriate administrative experience to carry out the following work:

- Co-ordinating the delivery, through all the teams, of activities to fulfil the terms of the grant, and ensuring the network works within the scope of the grant;

- Ensuring budgets are properly used through regular monitoring;
- Ensuring that reporting requirements for grants are fulfilled (submitting periodic reports on behalf of the network, updating of project web-sites, and financial reporting);
- Organising any project meetings (particularly management-specific ones) and any review meetings as and when required by the EC;
- Ensuring activities and participants are eligible and providing advice to teams through administrative contacts;
- Liaison with the Commission on all contract-related matters on behalf of the network;
- Liaison with team leaders and their administrators on all contractual matters.

The overall administrative and managerial structure is given in the diagram below.



In our work leading up to this project we have generated considerable interest. We anticipate that other countries would wish to join this effort. At present, we do not anticipate that we will be able to fund other country's work, but if other countries, at their own expense, wish to join the working group and produce data using the conventions and templates that we anticipate producing, we shall welcome this. The management structure is, we believe, robust enough to cope with this addition, since we would not anticipate moving funding to other countries.

B.2.2 Beneficiaries

B.2.2.1 Imperial College of Science, Technology and Medicine (IC)

Imperial College of Science, Technology and Medicine, (Imperial College London, Business School) is a world renowned business school, part of a world-class science and technology university. Consistently rated amongst the world's best universities, Imperial College London is a science-based institution with a reputation for excellence in teaching and research that attracts 12,000 students and 6,000 staff of the highest international quality. Innovative research at the College explores the connections between science, medicine, engineering and business, delivering practical solutions that improve our quality of life and the environment - underpinned by a dynamic enterprise culture. Since its foundation in 1907, Imperial's contributions to society have included the discovery of penicillin, the development of holography and the foundations of fibre optics.

This commitment to the application of research for the benefit of all continues today, including interdisciplinary collaborations to improve health in the UK and globally, tackle climate change, and develop clean and sustainable sources of energy. Professor Jonathan Haskel, from 1st October 2008, will lead the COINVEST team at Imperial College. Jonathan Haskel is a Professor of Economics at Imperial College Business School based in the Healthcare Management and Innovation and Enterprise Group. He is also School Research Director and a Member of the Reporting Panel of the UK Competition Commission.

B.2.2.2 The Conference Board in Europe (TCBE)

The Conference Board is the world's pre-eminent business membership and research organization. Best known for the Consumer Confidence Index and the Leading Economic Indicators, The Conference Board has undertaken issues-oriented research and senior executive peer-to-peer meetings. It will participate in this project through its Europe office based in Brussels.

Professor. Bart van Ark is Director, International Economic Research at The Conference Board Europe. Dr. van Ark is an internationally recognized expert in the area of international comparisons of economic performance and the analysis of technology and productivity. Dr. van Ark is also a full professor at the University of Groningen (the Netherlands) in the area of *Economics of Productivity and Technology Policy*, which is a chair endowed by The Conference Board. At Groningen University he teaches in the areas of economic growth, development economics, economic history and international economics and business. He is Director of the Groningen Growth and Development Centre, which is a research group of economists and economics historians in the area of long run economic growth and international comparisons of economic performance. He is also member of the editorial boards of several other academic journals and serves on various national and international advisory committees in the area of productivity and national accounts.

Professor van Ark has been co-ordinator of a large European consortium of research institutes, funded under the FP6 programme This project is funded by the European Commission, Research Directorate General as part of the 6th Framework Programme, Priority 8, "Policy Support and Anticipating Scientific and Technological Needs" entitled "Productivity in the European Union: A Comparative Industry Approach" (www.euklems.net) This has produced the EUKLEMS dataset, now the definitive international dataset for analysing productivity and competitive data, and a string of papers on EU growth and competitiveness. The data was released in Brussels on 15th March 2007. Thus far, the work has not looked at the full range of intangibles and this project will expand that important work.

Charles R. Hulten is Senior Fellow at The Conference Board Europe and Professor of Economics at the University of Maryland. He is a Research Associate of the National Bureau of Economic Research and Chairman of the Conference on Research in Income and Wealth. He also serves as a member of the Bureau of Economic Analysis Advisory Committee, as well as the Committee on Economic Statistics of the American Economic Association, and is an American Economic Association representative to the Council of Professional Associations of Federal Statistics. He has been a member of the Canberra Group advisory committee, established by the Inter-Secretarial Working Group on National Accounts as part of the United Nations Statistical Commission to support the revision of the U.N. System of National Accounts. Hulten's research interests include the areas of productivity analysis, economic growth and capital formation, tax

policy, and the measurement of economic depreciation. He has been engaged in various comparative studies and has published widely in national and international journals.

B.2.2.3 CNRS-GRECSTA

The Centre National de la Recherche Scientifique (National Centre for Scientific Research) is a government-funded research organization under the administrative authority of France's Ministry of Research. The "Groupe de recherche en économie et statistique - GRECSTA / UMR 2773" is a Joint Research Unit between CNRS and Institut National de la Statistique et des Etudes Economiques (INSEE).

Professor Jacques Mairesse will lead the GRECSTA team. He is currently "Inspecteur Général" at INSEE (Institut National de la Statistique et des Etudes Economiques) and a senior researcher of the microeconomic laboratory (LMI) at CREST (Centre de Recherches en Economie et Statistique) and at GRECSTA (Groupe de Recherche en Economie et Statistique - UMR 2773). He is also a scientific advisor to the Directorate for Firm Statistics at INSEE. He is "Directeur d'Etudes" at EHESS (Ecole des Hautes Etudes en Sciences Sociales) since 1978 and a Research Associate of the NBER (National Bureau of Economic Research) since 1980. His scholarly work has been mainly in the field of production economics and panel data econometrics, focusing on measurement of capital, productivity and technical change issues. He has been engaged in various comparative studies and has published very widely in national and international journals. Other team members will include Guy Laroque, "Inspecteur général" at INSEE, Sylvie Le Laidier, "Administrateur" at INSEE, who is head of the "Concepts, methodes et evaluation des Comptes Nationaux" Division at INSEE; and Gilbert Cette, Director of Macroeconomic Analysis at the Banque de France and research associate at INSEE

B.2.2.4 Institutet för Näringslivsforskning (IFN)

The Research Institute of Industrial Economics (IFN) is a private non-profit research institution founded in 1939 by the Federation of Swedish Industries and the Swedish Employers' Confederation "to conduct research on economic and social issues with relevance for industrial development". The institute is devoted to independent, non-partisan, high-quality academic research in economics. The principal of the Foundation is the Confederation of Swedish Enterprise, which also finances approximately half of the budget. The remaining share of the budget is financed by research grants from private and public sources. The institute obtains funding for research projects in competition with other leading departments and institutions in its field.

The IFN team will be led by Henrik Jordahl (PhD Uppsala University), who is Director of the institute's research programme on the service sector. His research is mainly focused on cost and quality comparisons of private and public production of publicly financed services, but he is also interested in the globalization and localization of service production, as well as in how voting responds to changes in the public sector's supply of services.

B.2.2.5 Instituto Superior Técnico, Technical University of Lisbon (IST)

The Instituto Superior Técnico (IST) is a Portuguese Faculty of Engineering, belonging to the UTL - Universidade Técnica de Lisboa (Lisbon Technical University). It is a public institution of university higher education with great scientific and financial autonomy, founded in 1911. This school belongs to the CLUSTER (Consortium Linking Universities of Science and Technology for Education and Research), which is a network of leading European Universities of Technology; their fundamental missions are advanced research and higher education of engineers, scientists and architects.

Francisco Lima (hD Universidade Nova de Lisboa) will lead the Portuguese team from Instituto Superior Técnico Lisboa (IST) where he is currently an assistant professor in the Department of Engineering and Management as well as vice-president of the Centre for Management Studies (CEG-IST). He will be supported by Rui Baptista, Associate Professor of Strategy and Organizations in the Department of Engineering and Management.

B.2.2.6 Club Ekonomika 2000 (CLUB2000)

Club "Economika 2000" is the successor to the 'Young Economists' Club' at the Bulgarian Academy of Sciences. The Club was established in 1977 as an informal union of young research fellows at the Institute. Its mission was to encourage revolutionary thinking and to provoke innovative ideas in society. Club "Economika 2000" has extended this activity as, shortly after the democratic changes in Bulgaria, on October 5th 1990, Club "Economika 2000" was registered as a Non-Governmental Organisation.

Club "Economika 2000" is now a high-tech research and training Bulgarian non-governmental organisation with over 15-year experience, dedicated to the economic development and prosperity of the Bulgarian nation and the transition economies. The Club carries out socio-economic research, provides advice to government and businesses, organises training programmes and provides a forum for debates and wide exchange of ideas.

The Club2000 will be led by its Director of Research, Todor Gradev, who obtained his training as an economist at Queen Mary, University of London, and participated in several research projects co-funded under previous Framework Programmes of the European Union as well as ACE and Phare projects. These included work on the future of industry in Europe, information technology and computer networking, European joint ventures and foreign direct investment, small business development and private enterprise. His current principal area of research is the quantification of contributions to industrial and economic development of taxonomy of economic agents: businesses, regional and local governments, intermediaries, and the NGOs. In this project, he will draw on the well-established network of the Club, and will conduct statistical data analysis of information available from public sources

B.2.2.7 Centre for European Economic Research (ZEW)

The ZEW is a non-profit economic research institute established as a limited liability company (GmbH). It was founded in 1990 on the initiative of the government of the federal state Baden-Württemberg, trade and industry, and the University of Mannheim. In April 1991 the institute began work and has expanded rapidly since then. The ZEW works in the field of user-related empirical economic research. In this context it has particularly distinguished itself nationally and internationally by analysing internationally comparative issues in the European context and by compiling scientifically important data bases. It is a non-profit economic research institute employing some 140 employees whose work is targeted at decision-makers in politics, economics, and administration, scientists in the national and international arena as well as the interested public.

The ZEW team will be led by Dr. Georg Licht, Head of Department of Industrial Economics and International Management. He studied political economy at Tübingen and Heidelberg and obtained his PhD from the University of Augsburg. He is currently working on international comparisons of the impact of R&D programmes on innovation and generating regionalised data on firm formation activities in the new Eastern European member states of the EU – exploration and ex-emplified implementation. Research interests comprise the economics of innovation and technical change; labour economics; and High-Tech Start-ups. He is consultant to the OECD, EU-Commission and the German Federal Ministry of Education and Research in the area of innovation and technology policy. In this context he recently co-ordinated a large scale project on the technological competitiveness of Germany and prepared related summary reports to the German research ministry. Currently, he is member of Commissioner Janez Potočnik advisory group “Knowledge for growth”.

Bettina Peters studied economics with major in econometrics and statistics at the University of Kiel in Germany from 1991 to 1997. After receiving her diploma degree in quantitative economics, she was research and teaching assistant at the Institute of Microeconomics at the University of Kiel. Since April 2000 she is a research fellow at the Centre for European Economic Research, Department of Industrial Economics and International Management. Currently, she is a member of a group on firm innovation behaviour and is particularly engaged in the conceptual development and analysis of the Mannheim Innovation Panel. Every fourth year, this panel makes up the German part of the Community Innovation Surveys (CIS). Her main research interests cover the economics of innovation at the firm-level, in particular productivity and employment effects of innovation, dynamics in firm innovation behaviour and the relationship between competition and innovation. Her doctoral thesis which she finished in July 2006 examines the impact of innovation activities on firms’ performance. She was a visiting researcher at the University of Southern Denmark, Odense, at CREST-Insee, Paris, at KU Leuven and at Boston University.

Tobias Schmidt studied Economics at the University of Augsburg. His fields of concentration were innovation economics and computer science. Thanks to a DAAD scholarship Mr. Schmidt was able to attend Wayne State University (WSU) in Detroit, Michigan, USA. He graduated from WSU in May 2000 with a Master of Arts in Economics. He started to work at the "industrial economics and international management" department at the Center for European Economic Research (ZEW) in October 2001. His primary research interest is the Mannheim innovation panel and the Community Innovation Survey. He represents the ZEW at

Eurostat and OECD Task Forces on Innovation Indicators. Since the beginning of 2004 Tobias Schmidt is an external PhD student at the Economics department of the Friedrich-Schiller-Universität Jena. In his dissertation he investigates the role of knowledge spillovers in firms' innovation co-operation decisions.

B.2.2.8 Queen Mary and Westfield College, University of London

Queen Mary is one of the leading colleges in the federal University of London, with over 12,000 undergraduate and postgraduate students, and an academic and support staff of around 2,600. In addition, it is a research-focused higher education institution with over 80% of research staff working in departments where research is of international or national excellence (UK's Research Assessment Exercise 2001), compared to a national benchmark of 55%. It has a strong international reputation, with around 20 per cent of students coming from over 100 countries.

The College has 21 academic departments and institutes organised into three sectors: Science and Engineering; Humanities, Social Sciences and Laws; and the School of Medicine and Dentistry. It has an annual turnover of over £200 million, research income worth £43 million, and it generates employment and output worth £500 million to the UK economy each year. Queen Mary is an acknowledged leader in its chosen areas of research, winning the highest increase in research funding in the country amongst research-focused institutions from the Higher Education Funding Council in 2006-7. Queen Mary has invested £175 million over the last decade to provide a uniquely stimulating and innovative teaching and learning environment for its 12,000 students on the largest self-contained residential campus in London and its other three campuses across East and Central London.

The QMUL team will be led by Jonathan Haskel, who is Professor of Economics at the Department of Economics, Queen Mary, University of London where he is currently head of department. His research interests are productivity, labour and industrial economics. He is a fellow of the Centre for Economic Policy Research, London, and a research associate of the Institute of Labour at Bonn (IZA). He has taught at the University of Bristol and London Business School and been a visiting professor at the Stern School of Business, New York University and the Australian National University. He has also worked on secondments to the UK Treasury and the UK Office of National Statistics (ONS). He is on the editorial panel of *Economica*, a fellow of the Advanced Institute of Management and a member of the UK Competition Commission. He is also Director of CeRiBA, a research centre based at the ONS microeconomic analysis of business data focusing on productivity issues and is the UK's dataset which comes closest to a firm census. It is based on collaborations between colleagues from Europe, the US and South America. From 2003-2007 he ran a major project funded by the UK Economic and Social Research Council (ESRC). This involved continuing with this micro data work but also working with international colleagues again on productivity. This work involved working with Eric Bartelsman in Holland, and Carol Corrado, Charles Hulten, Dan Sichel and Matthew Slaughter in the US.

Pedro Martins (PhD Warwick) is currently a senior lecturer in the School of Business and Management at Queen Mary, University of London. He has published in several journals, including the Journal of the European Economic Association, Economics Letters, and Labour Economics. He has extensive experience in empirical analysis of micro (firm- and/or worker-level) data sets, focusing on issues regarding education, training, and organisation structures. Some of these data sets will also be used in the project, including “Quadros de Pessoal”, which has detailed individual information about all employees in Portugal and about their firms since 1982

B.2.3 Consortium as a whole

The consortium requires a blend of partners who have access and experience with the data in each country and knowledge and familiarity with leading-edge concepts to implement the study. We believe the consortium has this. Here are some examples. In Prof Charles Hulten, the project possesses one of the leading world experts in all aspects of capital theory and its relation to national accounts and productivity measurement. In Prof Bart van Ark, who has lead the FP6 EUKLEMS project, we have the leading expert in Europe on national accounts data and procedures. In Prof Jacques Mairesse, the consortium has one of the world’s experts on the analysis of micro-data particularly on productivity and innovation. These experts will be able to disseminate knowledge to all participants. In turn, each participant is expert on their country, has access to both macro and micro data and has the skills to incorporate and improve on the shared knowledge in the group. For example, Georg Licht has been involved with the EUKLEMS FP6 project and has worked very extensively with German and cross-country micro-data on innovation and productivity. Ylva Heden and Pedro Martins (CSE and QMUL respectively) both have access to very detailed matched employee-employer datasets in their respective countries. Such data sets are potentially resources for the more macro type analysis but also the micro data analysis, especially for looking at organisational capital, as has been done with matched employer-employee data sets for the US and UK (Abowd et al, 2005, Haskel et al, 2005). Finally, Todor Gradev, from Bulgaria, has access to detailed Production Census data. A transition economy is an interesting economy to study as a possible counter-example, at least at the start of transition, to a knowledge-based economy.

We believe the consortium has then the necessary complementarities of experience in running cross-country work (Bart Van Ark., Licht) and balance of intellectual leadership in the field (Hulten and Mairesse) and individual country knowledge.

B.2.3.1 Intersectoral collaborations and the role of SMEs in the project

The consortium shall involve industry mainly via The Conference Board, Brussels. The Conference Board, based in the US, but with offices and representation worldwide, is a pre-eminent business membership and research organisation. They carry out a very wide range of businesses related work from briefings, to the Consumer Confidence Index, to research on productivity. Our second involvement will be through the UK

Confederation of British Industry, likewise a pre-eminent business organisation with wide experience in business contacts and data collection (such as the Industrial Trends Survey). Both these organisations will lead us to be involved with SMEs, (although we might expect that intangible asset building might be less in such organisations).

B.2.4 Resources to be committed

The consortium requires an overall budget of €1,464,767.

Provision has been made for four formal steering committee meetings during this project, an initial planning meeting and a mid-project review, although participants will meet more often during the course of their research. It is also anticipated that the project would host an opening and a mid-term seminar, one final policy-orientated conference, one policy briefing targeted at audiences from newer Member States and Candidate countries, and a final academic Conference. Costs for producing new computer programs, a comprehensive questionnaire, a policy report and a Final Project Report arising from the research have been included in the budget.

Each team leader is expected to allocate 15% of his/her time to the project, with additional team members providing 10% of their time. The budget also allows for one full-time research assistant per team to be employed directly by the project over its two-year duration in order to provide the manpower necessary for carrying out the intensive work envisaged, particularly in collating and analysing data. QMUL and Imperial College London will both employ the same research assistant- QMUL from month 1 to month 16, whilst Imperial will employ the RA from month 17.

Bilateral visits are anticipated to be undertaken by each team and so a budget of €2000 per year per team has been incorporated into the requested budget, particularly to allow for such travel that does not coincide with any project management meetings (i.e. Steering Committee meetings). QMUL (and IC from month 13) will require an additional €5000 a year to liaise separately with each partner to co-ordinate research activities, particularly with regard to the Portuguese and Bulgarian teams, with which it will seek to develop collaborative work completely from scratch and provide substantial peer support to enable to reach the levels of expertise that currently exist in the other teams.

With regard to the management budget sought, each team will require a budget of €4000 per year to cover the costs of project management meetings, which will include not just the Steering Committee meetings but also for exchange of information involving all team members including the research assistants to maximise the cohesive approach to the work that the project consortium intends to promote. Furthermore, each team will require a budget of €2000 to cover any auditing costs although ZEW and CNRS-GRECSTA will require less according to their own internal procedures (€1000 and €500 respectively). QMUL will additionally require €2,515 to cover the costs incurred by Professor Haskel specifically in the management of the project (at 10% of his time for the first six months of the project) while IC (from month 7) will require €24,092 for the remaining 18 months; also, as mentioned earlier in the proposal, he will require the support of a part-time administrator at 0.4 full-time equivalent.

On a separate note, a budget of €8,750 will be sought and managed by QMUL to help cover the costs of project conferences to be hosted in year 1 of the project; IC in addition, will require costs of €6,750 from month 13 for meetings scheduled in year 2 of the project in Paris, Lisbon and Sofia, to which external experts and policymakers will be invited.

B3. IMPACT

B 3.1 Strategic impact

When European leaders met at a summit in Lisbon in March 2000 they set the European Union the goal of becoming " the most competitive and dynamic knowledge-driven economy by 2010" (EU, 2007). The spring European Council of 22-23 March 2005, at its half-way meeting, placed renewed focus on growth, innovation and employment and in particular on supporting knowledge and innovation. Whatever one thinks of the agenda and the realism or otherwise of its goals, it clearly places the knowledge economy in the forefront of policy interest. However, as argued throughout this proposal, major aspects of the knowledge economy are not measured properly and so cannot be analysed. R&D, investment in training for employees, and investment in organisational and reputational capital are all treated as intermediates. If the EU were to expand investment in these areas then it would not make any difference to GDP (although it would raise MFP growth under current conventions). Nor, since they are not well measured, can we currently understand whether EU countries vary in their investment in intangibles or how they have done in the past (we can only look at R&D since this is consistently measured across EU countries, but it is not part of output). Thus this work will transform the ability of many EU countries to both measure and understand the forces behind their progress in becoming knowledge economies.

The main contribution of the project will bring new data to bear some of the most crucial questions facing Europe, which will be of major interest to academics, policy makers and commentators alike. A very great deal of European policy is focused on ensuring growth in Europe, in turn motivated by the position relative to the (perceived) technological leader, namely the US. Such policy measures typically focus on the "knowledge economy". Yet, as discussed above, the major macro aggregates and corresponding micro conventions, actually do very little to measure the knowledge economy. This leaves us in a position where a major emphasis of policy is misaligned with the key measures that might better help us formulate such policy or monitor its effectiveness or both. Thus first and foremost, we hope that this project will have a major effect on rectifying this misalignment. In turn, we would hope this project leads to better understanding of European growth rates, how they can be rectified and how statistical procedures can be altered to better measure their determinants.

Some sense of the expected impacts can be gauged from the initial work in the US and the UK. In the US for example, Fed Chairman Bernanke explicitly referred to work on intangible assets as key to understanding the

future of US growth (see e.g. Remarks by Ben Bernanke, MIT Commencement address, June 2006). The work also featured as a lead article in *Business Week* (February 13th, 2006). In the UK, even early versions of this work have had an impact. For example, like in the rest of the EU, there is longstanding puzzle as to why investment rates in the UK have remained so static in the face of the ICT revolution (the ratio of nominal investment to nominal GDP has remained the same in the UK for the last half-century). A recent speech by one of the Monetary Policy Committee members cited UK work on intangible assets as a possible solution to this puzzle (Speech by Professor Tim Besley, 18 January 2007).

b. Steps that will be needed to bring about these impacts

The steps to be taken for these impacts are to assemble the team and deliver the work with attention to the dissemination to academics and policy-makers.

c. Specific areas where results can have an influence

Some particular impacts, that relate to this overall impact, will be as follows. First, the project will recalculate GDP for a number of major European countries. In our view, this is an impact of quite considerable moment that not many research projects can claim to deliver. Second, it will re-analyse the comparative macroeconomic performance of EU countries. Once GDP is recalculated it is of very great interest to see how the rankings of EU countries changes, if it does, relative to each other and relative to the US. Third, we shall re-analyse the drivers of growth in EU countries to see how intangible assets have affected economic performance. For example, as stated at the start of this proposal, a major fact that troubles many EU governments is that the (nominal) share of investment in (nominal) GDP has remained flat over the recent decades, leading many to worry that EU investment is not keeping up sufficiently with US investment in ICT and the like. A key research question is whether the resolution of the puzzle lies in the convention that much intangible spending is not measured as investment. Fourth, the project will contribute to an ongoing dialogue with national statistical agencies on how best to reflect the knowledge economy in statistical data.

d. Need for a European focus

The project needs a European focus since it relies on data gathering by each country likely using data that is not easily accessible from outside the country. In principle, most data should be freely available, since much of it is national accounts or survey data. In practice, we have found in the UK that many of the data sources are not easily accessible. Indeed, we have had to undertake the UK project at the Office for National Statistics in order to gather the necessary data. However, that knowledge and experience will be a crucial input into helping other countries to gather their data and given all the problems that we have overcome in the UK, we do not think this project will be feasible within the time limits starting from scratch.

d. Account is taken of other national or international research activities

We will take account of other activities in a number of ways. First, the team includes scholars at the forefront of the economic analysis of these issues the world over. The team bridges economics, statistics and accounting.

Second there are various moves by National Accounting standard setters to capitalise some forms of intangibles in the national accounts. For example, software is in the process of being incorporated. Also there are a number of projects to develop satellite accounts for R&D, see for example the US BEA work. We

would expect to keep in close contact with these efforts. Many of our consortium have close contacts with National Accounting conventions and practitioners and we would expect them to be involved throughout.

Third, there is some consideration of these issues by the accounting profession, summarised in, for example, OECD (2007). According to this document, no definite standards have yet been agreed. However, some practical experience has been gained in a series of studies by the UK Competition Commission, whose accountants have dealt with a large number of cases where intangible assets have featured and indeed estimated intangible assets from the “bottom up” rather than the top down. Jonathan Haskel is a member of the Commission and has been involved in these cases and so can incorporate this knowledge into the group; in addition, we can work with Commission accountants who are expert in this area.

Fourth, there is extensive work, some for each country and some comparative, on the economic impact of various intangible assets using micro data. For example, there are a number of studies of R&D from which it might be possible to get estimates to help measure depreciation rates and the like. One area where there is rather little data is the impact of training. Many micro studies use rather binary data on whether or training has been received, but there is comparatively little data on the amount that firms actually spend on training. One area which we will explore is possible use of the Community Innovation Survey. This is an EU-wide survey which has the interesting property of being the only micro survey that I am aware of that provides data on a range of intangible expenditures that are broader than R&D, such as training, marketing etc. There are some problems with the survey, most notably of sample selection in responses and poor response rates to some questions, but it might be worth countries exploring if the survey can be used.

Fifth, the OECD has a very strong interest in this subject and has initiated some exploratory meetings on it. We are involved in such meetings (Jonathan Haskel is speaking at the upcoming May 23rd 2007 meeting for example) and shall continue to involve the OECD. Note that the Yoshiaki Tojo, Head of the Economic Analysis and Statistics Division at the Directorate for Science, Technology and Industry at the OECD is on our advisory board.

Sixth, there is ongoing work at statistics bureaus on the development of measurement conventions and surveys. We would hope to have impact on these. Two examples might suffice. First, the question of the development of satellite accounts to measure some intangibles and their incorporation into national accounts, such as R&D, is ongoing work to which we should be able to contribute. Second, data on training, despite the prominence in policy discussions is typically collected from micro surveys in a rather piecemeal and informal fashion. Few surveys, for example, measure the opportunity cost of training (i.e. the foregone wages whilst spending time in training) but with some small alterations to questionnaires (on the UK Labour Force Survey for example), this could be done. Note that Tony Clayton, Chair of the OECD Working Party on Indicators for the Information Society and Divisional Director, Economic Analysis, UK Office of National Statistics) is also on our advisory board.

e. Assumptions and external factors that may determine whether the impacts will be achieved

We believe that given the considerable interest in the work so far we can achieve our impact. One external factor would be lack of existing data for a particular country, which would make measurement in that country less precise than we would prefer. Eastern European countries for example are likely to have considerable data gaps, but until we try we are unlikely to be able to find this out.

B 3.2 Plan for the use and dissemination of foreground

- *Summary*

This project will disseminate knowledge both within the team and outside it. Within the team, we have assembled world data and theory experts (such as Hulten, van Ark and Mairesse). Conferences and workshops will disseminate knowledge to all teams from their expertise. Outside the team, the project will produce working papers, databases and software. Working papers will be available on the internet and disseminated widely, see below. Working papers will include policy briefs for non-specialist policy-makers. Academic working papers will be submitted to peer-reviewed journals. The participants in the conference have a wealth of experience in this area and leading reputations in the field. We aim also to have a non-technical conferences to air the results more generally. The database will be available, subject to confidentiality, on the internet, likewise the software for generating the results.

- *Explanation*

The knowledge generated by the research proposed here will be managed and guided by the Project Coordinator, Jonathan Haskel, alongside the Project Steering Committee with additional advice from the External Advisory Committee. Participants will be encouraged to circulate initial results in working paper series, present papers at international workshops and seminars, and thereby receive feedback on their work. Feedback will also be assured by frequent interactions between the participants at different nodes in the consortium. This will ensure that the knowledge that eventually appears in the final report incorporates the state-of-the-art in terms of methodology, and has received input from a wide variety of perspectives and specialisms. Participants will be encouraged to publish individual papers in leading journals, to subject the work to further professional scrutiny, as well as to circulate work package results among the academic community. The work will also be presented at one or more *Public Discussion Meetings* – open events during which research is presented to a large audience of policy-makers, members of the academic sector, and private-sector organisations.

Members of the project are affiliated to organisations such as National Bureau of Economic Research (NBER, US), Centre for Policy Research (CEPR, London), the EUKLEMS project, the Groningen Growth and Development Centre (GGDC), Institute for the Study of Labour (IZA, Bonn), Centre for European Economic Research (ZEW, Mannheim), The Conference Board Europe (Brussels) and others, all of which have widely circulated working papers and/or significant business or policy presence.

The output of the proposed project, which will include a comprehensive final report and a substantial quantity of research papers, has the potential to have considerable impact in a number of important areas. This potential will be maximised by incorporating moments of discussion, consultation and dissemination at the beginning, middle and end of the project. In particular, meetings held at the start and middle of the project will provide opportunities for feedback from policy makers and enforcers, ensuring that the project sustains

its policy relevance (particularly with regard to the Commission's own policies in the area as well as maximising the potential of the research in question to contribute to Europe's knowledge economy needs).

The project also envisages using its current links with the research and policy communities to expand the number of people contributing to the research as the project progresses. The budget for this project includes explicit provisions for 4 workshops for the researchers on the team, the steering committee and the external advisory board of relevant policy makers and distinguished academics who are prominent in the field of research. Moreover, funds have been set aside in the budget to allow for travel by team members to meet with and work with other team members. Such expenditures will facilitate the collaboration and exchange of ideas that will be a central component of the successful implementation of the project.

- ***Meetings***

As noted above, the findings of this research project will be discussed at a mid-term meeting in a final academic conference in, a final dissemination meeting in, at a non-academic briefing in, and at a final research implementation conference. Subject to budget, we will have these meetings in a range of locations: London (where Steering Committee and External Advisory Committee meetings will take place in months 1, 7 and 18; the one scheduled for month 13 will be held around the Mid-Term Review meeting), Paris, Lisbon and Sofia.

In addition, teams based in newer member states and candidate countries (Bulgaria and others where possible) will use their regional contacts and expertise to organise briefings targeted specifically at the Central and East European policy community in Sofia.

- ***Publications***

In addition, each of the participating institutions has access to its own working paper series, has its own website, and runs its own public and research-orientated meetings. These will all be exploited to disseminate the work of the project. Having been published as discussion papers, and their findings widely discussed, papers will be revised and submitted to leading scientific journals.

The likely impact of the project will be enhanced by the researchers' demonstrated expertise in writing for non-academic, non-specialist audiences, using language that is clear and accessible to all. Moreover, the diversity of the research team's professional experience will ensure that – even before the project's outputs are made public – the findings are subject to a broad range of viewpoints and to considerable scrutiny.

We shall also be disseminating our work through a dedicated website which will also run the common project database and software. This will be based on the technology we have evolved with the www.ceriba.org.uk site where we have worked with comparative micro data across countries.

- ***Raising public participation and awareness***

We aim to do this via the non-technical summary, papers and the final report. Business Week and the Economist have both published articles on intangible assets in the past and we would aim to build on these contacts and interest.

- *IPR and Access rights*

One important principle of this project is to allow relevant access to this 'research' database as soon as possible and for there to be complete transparency with regard to the methods procedures used and concerning the sources of the information contained in the research database. This will support analytical research use within and outside consortium and facilitate uptake. The general rule concerning IPRs proposed for this project should be the so-called “open-network provision” (ONP) rules. The application of ONP rule to the COINVEST project implies the following:

- For the full duration of the project ownership of the database rests with the consortium.
- No one will have the right to publish any of the contents of database or to disseminate it in any other way or to use it in any other way unless specifically agreed to by the Commission services responsible. Any parties which the Commission services responsible allow to access the data for verification purposes must agree not to publish or disseminate the information in any way.
- At the end of the project (initially scheduled for month 24 ownership of the database will initially remain with the consortium and) given the public provision network rules only the consortium members will have the right to continue updating and extending the database themselves. However the Commission services may decide to take ownership of the research database at any time or to request that the ownership be transferred to a third party of its choice. In this case the owner must provide a complete and up to date version of the whole of the database and any supporting material in a format which is acceptable to the Commission services responsible for the project. The owner of the research database must only make the data available freely under open network and will not be authorized either to use it for any commercial purposes or to sell the database without the permission of the Commission services responsible for the project.
- The consortium must make provisions to keep the dedicated website operational and accessible for at least 3 years after the end of the project or until its contents are fully, freely and openly accessible elsewhere.

B4. ETHICAL ISSUES

Much of our data is publicly available via National Accounts. Some of the micro data is not. However, those in the group have used such data and are well appraised of the well-established confidentiality conditions. We shall of course adhere to these conditions as we have done in the past.

	YES	PAGE
Informed Consent		
• Does the proposal involve children?		
• Does the proposal involve patients or persons not able to give consent?		
• Does the proposal involve adult healthy volunteers?		
• Does the proposal involve Human Genetic Material?		
• Does the proposal involve Human biological samples?		
• Does the proposal involve Human data collection?		
Research on Human embryo/foetus		
• Does the proposal involve Human Embryos?		
• Does the proposal involve Human Foetal Tissue/ Cells?		
• Does the proposal involve Human Embryonic Stem Cells?		
Privacy		
• Does the proposal involve processing of genetic information or personal data(e.g. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)		
• Does the proposal involve tracking the location or observation of people?		
Research on Animals		
• Does the proposal involve research on animals?		
• Are those animals transgenic small laboratory animals?		
• Are those animals transgenic farm animals?		
• Are those animals cloning farm animals?		
• Are those animals non-human primates?		
Research Involving Developing Countries		
• Use of local resources (genetic, animal, plant etc)		
• Benefit to local community (capacity building i.e. access to health care, education etc)		
Dual Use		
• Research having potential military / terrorist application		
I CONFIRM THAT NONE OF THE ABOVE ISSUES	YES	

2. B5. CONSIDERATION OF GENDER ASPECTS

It is not possible to have an absolutely gender-neutral research project and as such, the project's Steering Committee will work towards ensuring that differences in approach and application between genders are taken into account in the delivery of this project.

This project has involved female researchers where possible. One of the senior members of the consortium, Ylva Heden-Westendahl is female and there are other teams which comprise female researchers. A gender-balanced, rather than gender-neutral, perspective will be taken in carrying out research objectives and dissemination activities. This will be evident from the speakers and participants at conferences, the timing of activities and the format of working practices, including flexible working hours. The ability to travel between teams will ensure that mentoring of junior female researchers and active role models, which will be built up at project meetings and bilateral visits, can be maintained.

Each of the Participant institutions is an equal opportunities employer and guarantees fairness to its employees irrespective of their gender through specific policies. These policies will be strictly adhered to by each of the project teams and any female researchers employed through the project will be provided with a level of support commensurate to their specific needs (e.g. childcare issues, flexible working hours related to these, etc.).