i4g Research & Innovation Policy Workshop
‘Innovating out of the Crisis’
Workshop Report

High Level Economic Policy Expert
Group Innovation for Growth | i4g
Relation of research & innovation with smart, sustainable and inclusive growth
EUROPEAN COMMISSION

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i4g Research & Innovation Policy Workshop
‘Innovating out of the Crisis’
Brussels, 28 November 2012
Workshop Report

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Relation of research
& innovation
with smart, sustainable
and inclusive growth
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The High-level Economic Policy Expert Group ‘Innovation for Growth – i4g’ of the Directorate-General for Research and Innovation (DG RTD) has drafted a series of policy papers in its first year of existence. The intention of the workshop ‘Innovating out of the crisis’ was to discuss a selection of these policy papers with the Cabinet of the Commissioner for Research & Innovation, with other policy DGs, with strategy units inside DG RTD, and with distinguished external experts. The presentations, information exchange and comments were programmed as an internal test of validity and quality of the i4g Policy Briefs and the open discussion and commentaries were perceived as informed statements, but strictly informal ones.

Shortly after the Commissioner for Research and Innovation had assumed her mandate she asked DG RTD to establish a High Level Economic Expert Group (1) providing advice:
- on the implementation of the Innovation Union;
- on the transformation from a research funding DG to an innovation DG, or better to a research and innovation DG;
- on how to overcome a lack of capacity of strategic justification for the new policy through the delivery of reliable economic ‘stories’;
- on how to depart from knowledge accumulation policies towards economic growth facilitator policies by innovation; and
- on how to change from a research input orientation towards the higher effectiveness of policies for outputs.

The ‘Innovation for Growth’ experts were asked to provide the best possible advice from an economic point of view on policy impacts of research and innovation to the Commission. Questions that emerged include the following:
- How can Cohesion Countries innovate and grow?
- Is excellence the only appropriate criterion for innovation and for Cohesion Countries?
- How should spill-overs be organised for the ‘laggards’?
- How should public procurement be used for innovation? What experiences exist already?
- Do new finance instruments, such as venture capital, improve innovation? Or are Seed Capital and Business Angels the way forward to increase the deal flows desperately needed for investors?
- Why don’t we possess the Googles, Apples, Facebooks, etc?
- How can innovation happen in times of crisis?

For the workshop, i4g suggested some ideas to be discussed around the theme ‘Innovating out of the crisis’. The theme originates in an i4g policy paper that contributes to the Annual Growth Survey (AGS) and the European Semester.

(1) See details for mandate, activities, and performance of the ‘Innovation for Growth – i4g’ High Level Economic Expert Group in Annex 3 of this documentation.
Therefore, the i4g contribution ‘Innovating out of the crisis’ received particular attention at the opening session of the workshop. John Bell, Head of Cabinet of Commissioner Máire Geoghegan-Quinn, introduced the policy context to which the ‘Innovation for Growth –i4g’ experts contributed. Prof. Luc Soete presented the Policy Brief that was responded to by Martin Larch from the Directorate-General for Economic and Financial Affairs (DG ECFIN).

Besides the main theme, three further complementing policy issues were evoked at the workshop and they have been treated in dedicated sessions accordingly. These themes and their specific treatments at the workshop were as follows:

> **Innovative public procurement**: This session had i4g Policy Brief input from Prof. Lena Tsipouri and was augmented by an additional presentation on US innovative procurement practices by Prof. David Mowery from the University of California at Berkeley, and an outside expert comment from Prof. Charles Edquist.

> **Innovation in Cohesion Countries – the case of Greece**: Prof. Lena Tsipouri presented the session-opening i4g Policy Brief and invited comments came from Prof. George Siotis from the Commission’s Task Force for Greece. Discussants were Mikel Landabaso, Directorate-General for Regional and Urban Policy (DG REGIO), and Gianluca Spinaci, Committee of the Regions (CoR).

> **Finance for innovation and Growth**: The session saw three i4g Policy Briefs presented by Prof. Reinhilde Veugelers on Venture Capital and fast-growing enterprises, Prof. Andrea Bonaccorsi on Seed Capital and Prof. Mariana Mazzucato on rewards for the state as a risk taker. The invited comments came from Marc Schublin from the European Investment Fund (EIF).

All sessions were concluded by heads of units in the Innovation Directorate of DG RTD, namely by Pierre Vigier, Peter Droell, Dimitri Corpakis and Jean-David Malo.

With this workshop, the i4g High Level Expert Group intended to mark the beginning of annual research and innovation (R&I) policy workshops. The workshop shall also contribute as an input for DG RTD to become a strategic DG, approaching innovation and growth from – and to overcome the departure of – the DG from only research support. In this context economic advice to a strategic DG is crucial.

This working document contains PowerPoint contributions to, comments on and conclusions for the first i4g policy workshop ‘Innovating out of the crisis’, which took place on 28 November 2012 at the Berlaymont Building in Brussels, as they were presented at the workshop. It also contains a summary of the event.

**Brussels, 21 December 2012, i4g Secretariat: Werner Wobbe and Mathias Rauch**
1. Summary
Set Up

The High Level Economic Policy Expert Group ‘Innovation for Growth – i4g’ of DG RTD supports the policy implementation of the Innovation Union. It shall therefore provide the best possible advice on policy impacts of research and innovation (R&I) to the Commission. In its first year of existence, i4g has drafted a series of policy briefs and more detailed policy papers. At the workshop, a selection of i4g Policy Briefs was presented and discussed with the Cabinet of the Commissioner for Research & Innovation, with other policy DGs (ECFIN, REGIO, MARKT), strategy units of DG RTD, and distinguished external experts. The workshop served as an internal validity and quality test for the i4g Policy Briefs. The open discussion and commentaries were perceived as informed statements, but strictly informal ones. With this workshop, the i4g High Level Expert Group intends to mark the beginning of an annual R&I policy workshop series.

Clara de la Torre chaired and opened the first session. She expressed her appreciation of the i4g work and reminded participants that not all i4g products were being presented today. Already one bigger piece has been delivered before the summer, namely the i4g contribution to the European Research Area (ERA) impact assessment for the ERA Communication on the ‘Socio-economic benefits of ERA’.

The prevailing theme of the workshop ‘Innovating out of the crisis’ originates from an i4g policy paper that contributes to the Annual Growth Survey (AGS) and the European Semester.\(^1\)

The i4g contribution ‘Innovating out of the crisis’ was given particular attention at the opening session of the workshop. John Bell, Head of Cabinet of Commissioner Geoghegan-Quinn, familiarised the workshop participants with the policy context to which the i4g experts contributed. The Commissioner and her Cabinet wanted to move R&I to the centre of the EU crisis response. The Commission needs well-designed policies for the implementation of the Innovation Union. In the current transformation from a research funding DG to a research and innovation DG with strategic policy competences, the analytical and strategic advice of i4g is most welcome. The mission is to depart from knowledge-accumulation policies to economic growth facilitator policies through innovation. The aim is to overcome the lack of capacity of strategic justification for the new innovation policy by delivering robust and reliable economic evidence, rather than 100% academic certainty.

In the opening session, Prof. Luc Soete presented the i4g Policy Brief that was responded to by Martin Larch from DG ECFIN. To deepen the overall theme, three complementing policy issues were evoked at the workshop and they have been treated in dedicated sessions accordingly. These themes and their specific treatment at the workshop were as follows:

- **Innovative public procurement**: This session had i4g Policy Brief input from Prof. Lena Tsipouri and was augmented by an additional presentation on US innovative procurement practices by Prof. David Mowery from the University of California at Berkley, and an outside expert comment from Prof. Charles Edquist.

- **Innovation in Cohesion Countries – the case of Greece**: Prof. Lena Tsipouri presented the session-opening i4g Policy Brief and invited comments came from Prof. George Siotis from the

\(^1\) See i4g Policy Brief No 1: ‘Innovating out of the Crisis’.
Commission’s Task Force for Greece. Discussants were Mikel Landabaso, Directorate-General for Regional and Urban Policy (DG REGIO), and Gianluca Spinaci, Committee of the Regions (CoR).

> **Finance for innovation and Growth.** The session saw three i4g Policy Briefs presented by Prof. Reinhilde Veugelers on Venture Capital and fast-growing enterprises, Prof. Andrea Bonaccorsi on Seed Capital and Prof. Mariana Mazzucato on rewards for the state as a risk taker. The invited comments came from Marc Schublin from the European Investment Fund (EIF).

All sessions were concluded by heads of units in the Innovation Directorate of DG RTD, namely by Pierre Vigier, Peter Droell, Dimitri Corpakis and Jean-David Malo.

Their specific role was to reflect on the implications for R&I policy within the realm of their particular unit.

1. Innovating out of the crisis

In his key note Luc Soete argued, in line with i4g Policy Brief No. 1 (2), that more radical structural reforms than those presented under the Annual Growth Survey (AGS 2012) are needed in analogy with the three headlines of the Europe 2020 strategy (smart, inclusive, and sustainable growth).

**Smart growth** requires smart public policy through:

> stronger cooperation in R&D with third countries and a stronger focus on the deployment of ICT-based technologies due to the internationalisation of knowledge;

> a shift from the Barcelona target to a new 3% knowledge investment policy target consisting of a 2% higher education and 1% public R&D effort, without being subjected to any fiscal consolidation measures; and

> limiting R&D tax credits across all EU Member States to 0.1% of GDP to avoid ‘net welfare losses’ as well as a ‘beggar-thy-neighbour’ effect.

**Sustainable growth** – influencing the direction of technological change by:

> establishing a European policy commitment to ‘green technologies’;

> enhancing both public and private research investments and technology transfers, while redressing the protection of intellectual property rights for those technologies; and

> making the EU a global leader through ‘Innovation Partnerships’ for green technologies, including China and the other BRIC+ countries as a matter of priority.

(2) See i4g Policy Brief No 1: ‘Innovating out of the Crisis’.
Safeguarding social cohesion in a Euro-crisis by:

> leveraging Structural Funds to boost local innovation and efficiency gains in the public sector;

> smart public specialisation, leading into a new phase of economic integration of public services in the EU;

> pilots for new innovative procurement of debt-stricken countries, regions or municipalities in Greece, Portugal, Spain or Italy through new North-South European Private-Public Partnerships (PPPs) aimed at reducing public electricity expenses and based on new creative financing solutions; and

> granting Commission Structural Funds as a form of regional RSFF by shifting the purely grant nature of Structural Funds to a loan facility.

The subsequent discussion focused on potential ways to re-balance growth and austerity policies. As a means to improve Member States’ revenues it was proposed to consider taxing ‘bits and bytes’ to capture intangibles in the economy. The challenges, i.e. in regards to public finance, for pro-active innovation policy in a zero-growth scenario were also discussed. Smart growth consolidation was seen as one potential option to explore, as well as cutting back on subsidies for outdated technologies (e.g. in the energy sector). Several speakers concluded that deeper integration was needed in order to overcome the current crisis.

**Martin Larch** (DG ECFIN) responded from a macroeconomic point of view as he is in charge of coordinating parts of the European Semester in DG ECFIN. He acknowledged that the crisis brings out diagnostic clarity and that it has made clear that Member States cannot escape from reforms. The AGS 2013, as well as the AGS of previous years, puts the ‘growth-friendly consolidation’ to the fore. It means the following for each Member State: fiscal consolidation, protecting to the greatest extent possible, growth-friendly expenditure, coupled with structural reforms in view of strengthening competitiveness and innovation. The country-specific recommendations issued under the European Semester also encompass policies fostering R&I, yet mostly in an indirect way by improving framework conditions. One key issue pertaining to fiscal policy in the crisis context is the quality of public finance and the issue to ‘do more with less’ and respecting the 3% of GDP reference value for the budget deficit.

Several discussants pointed to lack of data, e.g. on the use of Structural Funds, which still hinders good policy making. Thus, **John Bell** concluded that in view of the upcoming European Council on innovation (scheduled for October 2013), more robust data and convincing arguments stressing the economic importance of innovation are required. He also stressed that all stakeholders have a moral obligation to act on the challenges posed by the innovation divide within the EU. As regards public sector innovation, he proposed that i4g could provide advice on the role the EU could play to support Member States. Potential areas of action could include best practice exchanges or a review of state aid practices.

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(3) See Luc Soete and Karin Kamp: The ‘BIT TAX’: the case for further research. MERIT, University of Maastricht, Netherlands.
Pierre Vigier’s concluding remarks can be summarised as follows:

> Despite the crisis, R&I investment is holding rather strong in the EU.

> Facing the current economic and financial crisis ‘smart consolidation’ is critical in all Member States; they have the choice of which pathway of consolidation they choose in view of research, knowledge infrastructure and innovation.

> Considering smart consolidation, the quality impact of public and private spending has to be taken into account, while aiming at improved competitiveness and effectiveness:

  • in view of the ERA agenda, impact measurement is crucial;
  
  • in general, the impact of public activities on private performance has to be better understood and, in particular, the impact on public spending on economic decisions (i.e. investment behaviour) of private firms and individuals.

> Considering the issue of economic development and changes to be fostered, central issues are:

  • fast-growing innovative firms; and
  
  • IPR issues, and probably activities to implement patent pools.

Clara de la Torre highlighted in her session chair’s conclusion the issue of public sector innovation with regard to quality, productivity and effectiveness.

2. Innovative Public Procurement

In her i4g Policy Brief(4), as well as in her workshop presentation, Lena Tsipouri provided the following key messages:

> Powerful tools to foster innovation are specifically designed public procurements targeting innovations (PPI). Therefore, public procurement shall be utilised to stimulate innovation and to create new markets.

> Awareness raising and changing the minds of procurers is essential to overcome the slow and timid application of PPIs in Europe and to fight barriers and risks associated with the change of procurement culture.

> Actions to be taken for better use of PPI include:

  • building up the necessary human resources and skills for operating PPIs;

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(4) I4g Policy Brief N° 2, ‘Public Procurement of Innovation (PPI)’. 
• Structural Funds envisaging enabling measures in their guidelines; and

• a Minister responsible for procurement and innovation and/or the establishment of special agencies.

Moderate innovator countries and catching-up countries would, according to Lena Tsipouri, benefit most from PPI, as intervention needs are moderate and Structural Funds would be instrumental.

In his presentation, David Mowery showed that 64% of US federal procurement is skewed towards defence, the rest mostly on construction (energy efficiency) and health-related topics. He asserts that procurement policy has potential as an instrument of innovation policy. He also stressed that pre-commercial procurements (PCP), such as those of the Defence Advanced Research Project Agency (DARPA) in the US, are not the same as PPI. He claimed a close analogy between procurement and prizes. Particularly US military procurement has influenced adoption in the civilian economy as much as innovation. Recent experimentation by non-governmental organisations (NGOs) with procurement in global public health might establish potential for new lessons. US military procurement has had positive and negative effects in ‘dual-use’ technologies. Military influence in IT has declined over time. ‘Spin-off’ revenues also benefited from the scale of US military procurement programmes, which enabled competition among suppliers. However, procurement has enjoyed less success in US energy policy.

A high degree of similarity in user requirements between governmental and civilian applications is seen as an important factor in the successful use of procurement in innovation policy, but is difficult for government agencies to predict or manage. Similar user requirements are a key precondition to benefit from economies of scale and scope effects. Clearly, spill-overs from defence to innovation in the broader economy do exist (e.g. reduced reliance of ships on fossil fuel, better batteries, etc.). However, other demand-side policies (subsidies, mandates, etc.) arguably have been more effective in specific technologies (e.g. photovoltaic, biofuels). Mowery also introduced a distinction between direct effects of PPI (e.g. purchase of new product/service, state as the lead customer) and the more catalytic effects of PPI (when PPI stimulates largely private economic activity).

Charles Edquist clarified that innovation procurement is about new functions that need to be performed, rather than simply the purchase of new products. Over a reasonable period of time, a strong positive side effect on job creation occurs. Pre-commercial procurement (PCP) is by definition ‘no innovation procurement’, because PCP does not procure (commercial) products.

In the subsequent discussion, it became clear that the European Commission cannot practice innovation procurement as it is a rather small procurer, but PCP and catalytic procurement would certainly be worth looking at. Edquist highlights the importance of PCP up to the pilot phase for EU policy action. John Bell agrees and asserts this to be exactly DG RTD’s field of action. Another source of debate was the trade-off relation between PPI and the need for fiscal consolidation. Keith Sequeira wondered where and how to find the sophisticated public users in Europe. A technologically advanced and demanding civil service seems to be a vital prerequisite for PPI and the actual use of innovative technologies.
The concluding remarks by Peter Dröll were as follows:

- European PPI covers around 0.5% of GDP and should be doubled at least.
- The current fiscal consolidation stands in contradiction to enforced PPI activities.
- The US undertakes 64% of federal procurement in the defence equipment sector. The EU cannot cope with nor implement similar procedures in PPI as the US. Therefore, the EU has to find its own strategy.
- An EU approach would be based on user-similarities of products in order to create substantial markets for innovative products, such as, for example, those in hospitals or in lightening (lead-user) markets.
- Achievements reached so far in the EU are an approach on lead-user markets by Innovation Partnerships and trans-border procurements.
- PPI requires high knowledge and skills in the public administration to perform PPI. Europe has a shortage of personnel in that area. It should consequently invest in training and knowledge transfer.

### 3. The Innovation Divide: What Policies for Cohesion Countries?

Lena Tsipouri introduced the complex issue of tackling the innovation divide (5) still persisting between the so-called ‘Cohesion countries’ and regions (benefitting largely from the Union’s cohesion policy/Structural Funds) and the rest of Europe. She focused on the structural characteristics that may be detected, following years/decades of inefficient cohesion funding on most countries and regions. Furthermore, she reflected about policy implications for research and innovation, at national, regional and European levels. Spotlights were on the Greek case that is at the moment at the epicentre of the Eurozone crisis, with the Commission paying particular attention to it. The Greek case reveals a peculiar development model where growth did not necessarily stem from innovation, but from an ill-conceived consumption process. A long process of de-industrialisation resulting from insufficient adaptation to the developing Internal Market conditions has resulted in a services-dominated economy that creates little added value. Structural Funds support has been instrumental in modernising hard infrastructure, but did very little to modernise the economic structures of the country or spur innovation. Cohesion policy-supported Operational Programmes did not deliver on innovation, but largely helped maintained the status quo. In many ways they supported the survival of inefficient systems.

As regards R&I activities in Greece, Lena Tsipouri concluded that scientific excellence is not the problem, but the capacity to innovate and to commercially exploit research results.

Given the fact that Greece’s GDP today is 6% lower than pre-crisis levels, George Siotis (European Commission’s Task Force on Greece) commented that Structural Funds had a low impact on competitiveness due to extremely poor application and simple absorption as the main objective. He highlighted the

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(5) See i4g Policy Brief No. 6, ‘Growth impeding (obstructing) innovation: the case of Greece’.
need to learn extensively from the Greek failure where data provided were neither valid nor usable for researchers and policy makers. Hence, a much higher importance should be attached to evaluation processes.

Referring to the experiences of Italian regions, Gianluca Spinaci (CoR) proposed to look at investments in regional capacities and infrastructure, e.g., the modernisation of healthcare institutions, as a way to foster both public and private sector innovation.

Mikel Landabaso (DG REGIO) reminded those present that innovation is much broader than R&D. Also, infrastructures and functioning institutions are crucial for successful innovation processes. The broad spreading of grants to a large number of small enterprises missed the innovation potential. These facts have convinced DG REGIO to apply the Smart Specialisation Strategy, which fosters a better selection and concentration.

During the following discussion, Andrea Bonaccorsi proposed to consider additional conditionality and to fund the capacity to deliver results rather than actual projects. Luc Soete advocated a change towards revolving funds, by shifting from grants to loans.

The concluding remarks by Dimitri Corpakis were as follows:

> The case of Greece is largely atypical of other Cohesion Countries, and cannot be taken as a basis for deriving general policy implications for research and innovation:

- the country suffered a devastating civil war (1944-49), whose impact can still be felt;

- Greece is located in the extreme periphery of the Union;

- no particular vision for development seems to have captured the imagination of the people. It remains difficult to identify the core economic sectors that made or could make a difference in the country’s economic development in the future.

> Cohesion Countries do present some similarities in terms of framework conditions that favour or hamper innovation and thereby jobs and growth. Looking at the core of their national innovation systems, their academic communities and the business world follow trajectories that are largely asymptotic (they seldom meet). Academics pursue their scientific interests with little or no contribution to the local economies, and in turn, local economies develop with little or no connection to research and innovation stakeholders. Low-tech sectors predominate, creating insufficient demand to the universities and research centres that thus enter in a downward spiral of mutual avoidance and non-communication. This process creates more pressure for foreign assistance to local companies. Insufficient support to innovative initiatives leads largely to seriously fragmented innovation systems; a typical pattern in Cohesion Countries.

> Successive efforts of the Union’s cohesion policy have not yet succeeded in reversing the trends dominating national innovation systems in less-developed regions. Many factors can be blamed for this, including lack of competition, heavy and unrealistic planning and programming procedures, insufficient monitoring of implementation, as well as deficiencies of setting ambitious but achievable objectives.
An additional difficulty resulting from increased globalisation is the inability of many local stakeholders to position themselves in the context of global value chains and identify those market niches that could make a difference. The goal then is to redefine cohesion policy in order to achieve a radically new approach to growth, based inter alia on research and innovation.

Cohesion policy has made Smart Specialisation an ex-ante conditionality for all research and innovation investments. Focusing on the particular products or processes that a Member State/region could identify, R&I strategies for Smart Specialisation would guide and identify future choices and investments. The ex-ante conditionality on Smart Specialisation includes the need to put in place a performing national or regional innovation system, with the appropriate framework conditions for stimulating relevant private investment. In addition, the clause of Thematic Concentration of resources of the European Regional Development Fund (ERDF) on just four thematic objectives (Research and Innovation, SME Competitiveness, Low Carbon Economy, and investment and uptake of ICT) in all regions (80% in rich and 50% in poorer regions) will provide a good basis for healthy interactions with Horizon 2020, especially in the areas of Industrial Leadership and Societal Challenges.

4. Finance for Innovation & Growth

Session 4 was dedicated to the topic of finance for innovation and growth. Given the present state of the EU’s Venture Capital (VC) market, the following is particularly worrisome: The level of the EU’s VC market is down to the level of 1984, which equals a smaller volume than the VC market in Israel. The Commission VC market roughly equals 250 Funds, investing in some 3500 companies, of which 30% go to US when successful.

Three i4g members looked at this topic from different angles and presented their i4g Policy Briefs. Andrea Bonaccorsi proposed to move from a horizontal division of labour between private and public VC funding to a vertical one, where the public deals with Seed Capital. The reason is that cooperation proves difficult due to very different rules and culture. The state should not invest more than EUR 500,000 per company, not seek profits and not take a seat on the board. An additional advantage of such procedures would be the low cost, because VC rules would not apply in such cases.

Reinhilde Veugelers reminded participants that developing a viable VC market, incorporating a critical mass of investors and investments (a ‘thick’ market), is a long-term endeavour. In their early stages, VC markets display high vulnerability for (crisis) shocks. She suggested that beyond the quantity of VC available, what matters more is how effectively the market allocates Funds to the most promising projects: ‘smart’ VC funding, which requires thick markets. Government should not replace/crowd out, but instead leverage private market forces. David Mowery insisted that unforeseeable project risks and scale-related costs (due diligence, deal negotiation) makes the demand for VC very skewed.

Mariana Mazzucato observed that, since 1990, most policy makers and economists alike have stopped considering distributional questions. Her proposal to allow for some return on investment whenever the

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(6) i4g Policy Brief No. 5, ‘The public role in financing innovative companies: shifting from venture capital to seed investment’.
(7) i4g Policy Brief No. 4, ‘Financing for Innovation: Addressing Europe’s Early Stage Venture Gap’.
(8) i4g Policy Brief No. 9, ‘Smart and Inclusive Growth: reforming the risk-reward nexus in innovation’.
state takes a risk as an investor into R&I projects would allow for much needed additional state revenues that could be re-invested. She reminded participants that the current debate on ‘eco-systems for innovation’ fails to take into account that eco-systems can be both functional and dysfunctional (predator-prey relationship). The feasibility of her proposal to establish a golden IPR share for public funders was discussed extensively. David Mowery cautioned that the net returns would probably be very small and referred to the experiences with the Bayh-Dole Act\(^9\) in the US, plus the potentially high administrative cost of monitoring (and relating the profits to specific IP). According to him, returns in the US are negative.

According to Marc Schublin, the European Investment Fund (EIF) currently has negative returns. Therefore it currently moves to later stage investments. He used the example of Skype funding to illustrate the situation of VC in the EU: The EIF funded a Luxembourg-based VC fund, which got a 300-fold return on its EUR 200 000 investment, but since then no returns from other investments. He also mentioned that out of the 6 000 companies that benefitted from the EIF VC, 30% went to the US.

Jean-David Malo’s concluding remarks on Session 4 can be summarised as follows:

As highlighted by Marc Schublin, EIF Director, the situation of VC in Europe is in dire straits. The level of EU VC fundraising has dropped by 70% from 2008 to 2010 and the situation is even worse in 2011 and 2012, falling back to 1984 levels. This represents a smaller market than the Israeli one. Moreover, in all stages (from early to growth stage), the level of European private equity investment has been hugely diminishing from 2008 onwards. In addition, the EU market remains fragmented, affecting both cross-border fundraising and investing in innovative small and medium-sized enterprises (SMEs). Last but not least, the financial and economic crisis has increased risk aversion within the institutional investor community. This tendency is being reinforced by the new wave of prudential regulation (Basel III; Solvency II).

In this context – as access to risk finance in general and support to VC in particular are instrumental to innovation, new technology implementation and firm growth – public intervention is not only legitimate but necessary. For these reasons, out of the 34 commitments of the Innovation Union flagship initiative, three are directly linked to the issues of improving access to finance for SMEs, to debt and equity financial instruments to support R&I and growth, to strengthen cross-border matching of innovative firms with suitable investors, and to improving the VC market.

Several actions are already proposed (in particular in Horizon 2020 and in COSME) and are under examination:

• designing relevant debt and equity financial instruments providing, in complementarity with existing national/regional schemes, relevant support to enterprises (in particular SMEs and small Mid-Caps) throughout their lifecycle (from a very early stage to the growth/expansion stage), allowing in particular the possibility to support the growth of R&I-driven SMEs by a combination of grant and debt and/or equity funding (i.e. Horizon 2020 SME Instrument);

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\(^9\) The Bayh-Dole Act (Patent and Trademark Act Amendments of 1980, PL 96-517) created a uniform patent policy among the many federal agencies funding research.
• ensuring relevant legal framework conditions, including in the State Aid area (and in particular in the context of the review of the Risk Capital Guidelines);

• improving the eco-system by making it innovation- and investor-friendly, in particular strengthening supports allowing enterprises to become investor-ready on the one hand, and increasing investors’ knowledge of ‘promising enterprises’ on the other.

5. Major Conclusions and Messages for the i4g Work Programme 2013-14

In the final session, participants reflected on the workshop’s results, its major conclusions and the issues that would deserve further reflection in the i4g Expert Group. The following list of topics resulted from the discussion, benefiting among others from interventions by John Bell, Clara de la Torre, and Lena Tsipouri:

1. The innovation divide: Policies for Cohesion Countries. Within its work programme, i4g should look at innovation conditions and measures of the Cohesion Countries and the EU-12 Member States.


3. The EU’s 3% target and innovation. The economic relation between input and output and related to that: What kind of impact has the funding of research excellence on innovation?

4. What is the right economic policy mix to transform research into innovation and economic impact?

5. Public sector innovation: how can efficiency, effectiveness, and quality assurance be fostered?

6. Other issues following the workshop:
   • contribution of R&I to economic growth;
   • State aid policy – Where is the red line to draw?
   • economic productivity of RTD, including service sector productivity;
   • measurement of intangibles and taxing of intangibles (L. Soete).
2. Opening Session & Key Note: ‘Innovating out of the crisis’
Welcome & Opening Speech

Clara de la Torre(1)

A year ago the Commissioner asked DG RTD to establish a High Level Economic Expert Group to give advice on research and innovation policies. This economists’ group was named ‘Innovation for Growth’ – or in its short form, i4g. During its first year of existence, i4g has produced brief statements or Policy Briefs and papers on various subjects relevant to R&I policies.

The objective of the workshop is to discuss selected pieces of i4g policy advice. The overriding theme is ‘How to innovate and how the research community can contribute to combat the economic crisis?’, or in a nutshell: ‘Innovating out of the crisis’.

Not all pieces of i4g work will be presented today. Already one bigger piece has been delivered before the summer break, namely the contribution to the ERA impact assessment for the ERA Communication. It is the report on the ‘Socio-economic benefits of ERA’. Further i4g work is to come and the workshop is supposed to provide input.

The workshop is conceived as an open discussion platform and it is my pleasure to welcome colleagues from other DGs of the Commission. It is good practice to exchange intellectually between policy DGs and to assess the policy relevance of the expert papers. We look forward to your comments and suggestions. It will help us to reflect and to improve our R&I policy.

To start our workshop programme, first of all a warm welcome and my compliments to the i4g members.

Let me briefly mention today’s highlights before I give the floor to our distinguished speakers:

> It is my particular pleasure to welcome our special guest experts from the US – David Mowery – and from Europe – Charles Edquist – on the theme of ‘Innovative Public Procurement’.

> i4g does not shy away from a ‘hot’ issue in Europe: the innovation divide and the issue of innovation in Cohesion Countries. I look forward to hearing the opinion of Prof. Siotis from the Reichenbach Task Force and its work in Greece.

> New finance mechanisms for innovation and growth are a relatively new topic in DG RTD and I am glad that Marc Schublin from the European Investment Fund is with us today.

> The big and overriding theme ‘Innovating out of the crisis’ will be presented by Luc Soete. He has now left i4g to become Chair of our general advisory committee, ERIAB. I look forward to the comment from Martin Larch of DG ECFIN.

I appreciate the high-level participation from other policy DGs of the Commission, I am grateful to the initiative of the Cabinet to have convened the High Level Economic Expert Group ‘Innovation for Growth – i4g’,

(1) Director, DG RTD, Directorate C, Research & Innovation.
and I am also grateful for the active participation of our Cabinet in the workshop. Merits go to i4g for the excellent preparation. I have to be thankful that you – the participants selected because of your expertise – have accepted the invitation and I am now looking forward to your highly interesting contributions and to the discussion.

Innovating out of the crisis: some personal reflections

Luc Soete(2)

A personal ‘i4g’ view

Going back to the Europe 2020 strategy highlights three central entry points for the EU to ‘innovate out of the growth crisis’:

• first, the importance of investments in R&I, both public and private – the ‘rate’ of technical change – an old European (Lisbon) concern that needs urgently to be reassessed within the fiscal consolidation framework of the AGS 2012. To put it bluntly, what the AGS proposes is anything but ‘smart’ growth;

• the importance of the ‘direction’ of technical change: environmental sustainability, societal and new social innovation areas. Such a direction depends heavily on public policy; on setting out clear, consistent rules and regulations across Member States in an internal domestic pro-growth direction. What the AGS proposes is anything but ‘sustainable’ growth;

• the regional growth impact of R&I policies in Europe within the context of a sovereign debt crisis, concentrated in a number of peripheral countries. How can Structural Funds be leveraged to boost local innovation and efficiency gains there? While the AGS talks about social issues, it does not address ‘inclusive’, social cohesion growth.

All three areas call for more radical structural reforms in policy making than those presented under the AGS 2012, from the perspective of:

• an obvious lack of effectiveness of some of the proposals;

• the need for more radical reform in the multi-level (European, national regional) governance of R&I policy; and

• opportunities for new innovative solutions to the current fiscal consolidation framework.

Without these reforms, the EU is doomed to a low growth, high unemployment future this decade, but also the next one...

(2) i4g (2011/12), Director of UNU-MERIT, Rector Magnificus of Maastricht University, the Netherlands.
1. Achieving harmonised growth?

> Fiscal consolidation common to all EU Member States:

- much more of the fiscal ‘austerity’ type in some countries, ‘consolidation’ in others;

- huge differences between short-term financial public needs (cash access) in some Member States vs. long-term financial concerns (ageing, healthcare, welfare systems and pension payments to baby boomers) in other Member States;

- as a result, very different prioritisations with respect to long-term knowledge investments in Member States.

> New situation of growth divergence between Member States and regions:

- pursuing differentiated growth-friendly fiscal consolidation will not solve this;

- growth divergence between EU-15 countries, based on centre-periphery impact of access to the EU Single Market, is dominant;

- exacerbated by financial markets’ responses to sovereign debt within a monetary union (see Paul de Grauw, and Yuemei Ji, 2012): ‘The systematic mispricing of sovereign debt observed in the Eurozone also had the effect of giving wrong incentives to policymakers. During the boom years, when financial markets were blind to the sovereign risks, no incentives were given to policy makers to reduce their debts, as the latter were priced so favourably. Since the start of the financial crisis financial markets driven by panic overpriced risks and gave incentives to policymakers to introduce excessive austerity programs.’
European research and innovation policy and competitiveness

- How can EU R&I and structural change policies respond within such a ‘differentiated fiscal consolidation’ public debt context, whereby some Member States and regions are in a position to ‘match’ EU funding relatively easily, while others are lacking public funds to obtain EU R&I or Structural Funds.

- Need to reprioritise investments in knowledge as the only long-term sustainable solution to the EU growth crisis in a back-to-basics approach:
  - the European integration process is only politically sustainable if based on real growth convergence;
  - international competitiveness of manufacturing, agriculture and tradable services is essential for such real growth convergence;
  - at current interest rates, public knowledge investment in education, research and innovation, even if it is based on deficit spending, will yield high net rates of return.

- Start again from the argument already made two years ago in an expert group report on the ERA for the Commission: there is today an absolute need for a clear public funding commitment to knowledge investments (R&D, innovation, higher education) in Europe across all Member States.

On Europe’s ‘rate of technical change’

- It made little sense back in 2002 to introduce a Barcelona 3% R&D/GDP target, as part of the 2000 Lisbon strategy, whereby one asked the private sector, as opposed to the public sector, to invest most in R&D (2% vs. 1%) without offering private firms any means to leverage such an effort.

- Asking for more private investment in R&D without offering a credible plan for integrating further the final Single Market both in products and services, was viewed in retrospect as missing the point:
  - companies invest private resources in R&D only if they consider the final market large enough to recover the investment;
  - having national markets fragmented by regulation, language, and entry processes, implies an increase in the marginal costs of the overall ‘time-to-market’ decision, leading to a reduction of the rate of return to R&D investment;
  - the institutional separation between European research, leading to proof-of-concept or a prototype stage, European innovation policy and European competition policy, remained a continuous source of uncertainty;
  - many services of direct relevance to innovation (financial services, telecom services, education services, social services) remained exempt from the Single Market services Directive and hence became at European level dominated by fragmented national regulation.
3% public knowledge investment vs. 3% fiscal consolidation

Hence the old proposal for an alternative 3% public knowledge investment target with clear policy advantages over the old Barcelona 3% target:

- it focuses on what governments are directly responsible for, whether in terms of direct funding such as public R&D, or in setting the funding rules as in the case of funding directly higher education or fixing tuition fees with respect to higher education;

- the new 3% target thus offers credibility. Public authorities can be kept accountable for succeeding or having failed to reach the target;

- all European Member States are challenged to either find their own public resources to increase such knowledge investments, or alternatively to call upon private resources to invest in individuals’ future human capital;

- the target is realistic even under the severe fiscal consolidation conditions Member States with large sovereign debt problems are confronted with today, because it also offers scope for lowering the public funding part of higher education in favour of raising private funding through, for example, tuition fees;

- the growth in private R&D investment as a % of GDP can be viewed as the outcome of the policy: public R&D and higher education investment have attracted increased private domestic or foreign investment.

Proposal: separate public investments in knowledge (education, research and innovation) from the fiscal consolidation targets.

THE ALTERNATIVE 3% TARGET FOR 2020
2. Achieving sustainable-friendly fiscal consolidation

- A green economy will require a major private sector commitment to creating more efficient green technology options.

- However, private sector investment is, apart from the current financial uncertainties, unlikely to be forthcoming as long as there is no clear and full commitment to setting an effective price on Green House Gas (GHG) emissions – by setting tight caps that will not be quietly loosened by the issuance of additional emissions permits to alleviate industrial ‘distress’.

- The current danger is that the public debt crisis leads to an ‘inadequate-effort level equilibrium trap’ as exemplified by the case of carbon-capture technologies. Because current costs of carbon-capture pilot operations are too high to make it believable that firms facing CO₂ emissions limits would adopt these methods, many countries (in particular those with coal deposits) resist tight caps on CO₂ emissions – in the absence of affordable carbon capture they would lose access to that source of energy, and profits, respectively.

- As a result, the necessary private investment in R&D (required to create the expectation that those caps would turn out to be tolerable) is simply not forthcoming.

- Furthermore, there is a need to broaden research and innovation to include the rest of the world. At the same time such broadening raises questions as to how to achieve green competitiveness for European industry.
> There is an urgent need to get out of the Euro-focus and again become leading leader in green technologies in relation to the rest of the world. Why not think of ‘Innovation Partnerships’ as proposed in the Innovation Union flagship initiative with BRIC countries (e.g. in case of NER 300 and Carbon Capture Schemes and/or energy renewables), but also with other developing countries?

**Green-friendly consumption**

> From a global perspective, at the sustainable consumption level, the innovation challenge appears (see figure below) at opposing ends: avoid the tendency towards what Emilio Calvano called ‘destructive creation’ (Soete, 2012) in favour of frugal innovation.

> The international financial crisis and the looming crisis of climate change have brought to the fore an understanding that the realistic solution to a truly global sustainable development strategy will not be simply to provide the world’s investors with global financial access. Having access to the fruits of expanded PPIs in science and technology at the global level will be no less – and probably even more – critical in the long run.

> What makes the ‘climate crisis’ a unique green growth opportunity, if a perilous one, is that the sustainable future for the citizens of Europe, the US or Japan, are crucially dependent on the speed of (green) knowledge diffusion throughout the rest of the world as well as in their own countries.

> In short, a Europe 2020 sustainable growth strategy needs to be called a global 2020 strategy, in which Europe takes the lead.

**HUMAN WELFARE AND ECOLOGICAL FOOTPRINTS COMPARED**

![Graph showing human development index ranking and ecological footprint comparison](https://via.placeholder.com/150)

- **Human Development Index ranking (1-177)**
- **Ecological Footprint (global hectares per capita)**

Earth’s biocapacity = 2.1 hectares per person

3. Social cohesion and European public sector integration

> The key sector that has – up to now – been ignored in economic integration in Europe is the public sector.

> The fiscal consolidation has forced Member States to cut back on public investment projects. One of the central problems here is that the old 3% Maastricht criteria of public deficit does not take into account the quality of public expenditures.

> There is a huge growth difference between public expenditures devoted to consumption activities and public expenditures devoted to public investment across EU Member States.

> One of the most robust results from modern growth theory is the strong positive impact of public investments in, for example, infrastructure and education boosting overall productivity and hence also economic growth.

> Yet, as highlighted in the graph below, European governments have dramatically cut back in public investment over the past two decades.

**PUBLIC INVESTMENTS AS % OF GDP**

![Graph showing public investments as a percentage of GDP over time for the Eurozone and the United States, decreasing sharply over the past two decades. Source: European Commission, AMECO databank.](image-url)
a) First proposal

> It is not just a question of the volume but rather the quality of such investments.

> What I propose is to allow the best performing European Member State public services to take the lead in a new phase of economic integration in the EU: that of public services. As a result, the performance of the public sector in Europe – still responsible for the largest part of GDP – will receive a dramatic boost in efficacy and efficiency.

> We all know the typical European joke of the Brussels dinner organised by an Italian, prepared by a Briton and with a German giving the after dinner speech. But the ideal picture also exists of course. There is no reason not to exploit much more fully across Europe the diversity in different Member States, even regions, of the quality and efficiency of public service delivery, i.e. **Smart public specialisation**.

> Think of our Dutch tax-paying office taking on the responsibility for earning tax revenues in Greece, Italy or even Belgium.
b) Second proposal

- The large sovereign debt in some of the peripheral European countries should be viewed as potential pilot cases for triggering innovation in public procurement with the help of the private sector.

- Concrete example of lighting. About 19% of the electricity generated globally is used for lighting purposes and around 70% of all existing lighting equipment is energy inefficient by today's standards. Lighting, and in particular public lighting, is a pure case of ‘low-hanging fruit’ innovation. New technologies such as LEDs can provide energy savings of up to 80%.

- Debt-stricken countries, regions or municipalities in Greece, Portugal, Spain or Italy, should become pilots for new innovative procurement aimed at reducing public electricity expenses and based on new creative financing solutions. One could talk here about new North-South European PPPs. Furthermore, with the help of the European Investment Bank (EIB) using available Structural Funds, it should be relatively straightforward to eliminate the ‘lowest initial cost’ bias from the public sector’s procurement equation in those countries/regions.

- See proposal put forward by ERAB members Jan van den Biesen, Anne Glover and me linking Structural Funds with innovative public procurement. This proposal goes much further than the points made under Chapter 5 of the AGS 2012.

Conclusions: Reaping policy synergies

- It is essential to re-assess the smart, sustainable and inclusive growth strategy of Europe 2020 in light of the new fiscal consolidation constraints.

- Current growth forecasts (as presented above from the Belgian ‘Bureau du Plan’ for the DEMETER project) based on the current fiscal consolidation plans for the period 2010-15 and 2015-20 are poor, and in all likelihood overestimated.

- A recent conference in The Hague (NL) had as its title ‘Development without economic growth’. I had to introduce the session on ‘Innovation without economic growth’. A strange hypothesis given the endogenous nature of innovation, but revealing in bringing about the way we seem to narrow down innovation to just GDP ‘measured’ economic performance.

- Innovation though has a much broader impact. The largest companies in the world such as Google or Facebook are using a business model based on the barter exchange between consumer time spent on banners and advertising and information search and communication exchange. According to McKinsey, the total value of online advertising revenues is only a fraction (at most one third) of total consumer value of online information and communication. If one broadens this further to access to information, mobility, security, etc., a strong case can be made that the growth value of new digital technologies is particularly poorly reflected in GDP growth.

- In this sense government revenues seem to become increasingly narrowed down to a taxation of tangible goods and services and their exchange, and missing the largest part of growth in well-being in our societies.

- Time for the public sector to design similar Google business models?
3. Innovative Public Procurement
Public Procurement of Innovation (PPI)

Lena Tsipouri\(^{(1)}\)

What is PPI?

- A kind of public-private partnership.
- The government specifies a desired output (immediate and/or future needs) and the social challenges to be met.
- The private businesses creativity and efficiency are mobilised to meet the requirements with the best technologies (available or to be developed).

PPI can be classified according to (at least) two dimensions:

1. **The character of the procurer**: depending on whether the procurer tenders for themself or is coordinating.
   - Direct or
   - Catalytic PPI.

2. **The novelty of the product and its position in the innovation cycle**:
   - **Developmental or creation-oriented PPI**, for completely new-to-the-world products and/or systems are created as a result of the procurement process.
   - **Adaptive or diffusion-oriented PPI**, when the product or system procured incorporates incremental technological change.

The economic rationale

- Market failures lead to sub-optimal investment in R&D and innovation because of risks and appropriability.
- Intervention for public goods (such as climate change).
- **Economies of scale**: many procurers have the same needs.
- **Increasing competitiveness** in new technologies in general and lead markets in particular.

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Experiences of PPI (Who does what?)

- Despite convergence of academic and policy recommendations, PPI remains a rarely used instrument
- Scandinavian countries
- Germany – Austria
- Netherlands – Belgium
- UK
- Estonia.

Three important questions

- Is the political will in each Member State so explicit in favour of combined policies that policy makers can take the risks of experimenting? How can we pass from rhetoric to practice?
- Are the means and tools available to do so? Because we recognise that the devil is in the details.
- And what are the main barriers that inhibit a policy adaptation? And how should we address them?

Problems and barriers (Why does it not work fast enough?)


4. *The significant skills needed for operating PPIs*.

5. *The risks of the PPI process*.

6. Risks of market distortions (lock-ins, large players dominating the global market).

7. Lack of sophisticated demand.

8. Finally, the institutional framework.

Suggested interventions (What to do next?)

- The PPI culture and climate
- Policies
- Governance.

David C. Mowery\(^{(2)}\)

Overview

- Defining and measuring federal procurement.
  - Why procurement does not include DARPA and SBIR.
- How does procurement influence innovation and diffusion?
- Sectoral case studies:
  - defence-related procurement and IT innovation;
  - energy-related procurement and innovation.
- Procurement policy design issues.
- Conclusion: Where and how can government procurement support innovation?

Federal procurement spending, FY2010

- Census Bureau (2011) defines procurement spending as ‘contractual actions for construction, purchases of equipment, and other purchases of tangible items by the federal government.’
- Procurement accounted for more than USD 500 billion in FY2010, 15.8% of total federal spending.
- Federal procurement is even more skewed toward defence (64% of FY2010 procurement) than federal R&D spending, which is not included in procurement.

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• NSF and HHS (parent of NIH) also represent smaller shares of non-defence procurement than is true of non-defence federal R&D.

Civilian federal procurement budget is dominated by the Energy Department, Veterans Administration (medical centres).

• Since much Energy Department procurement is connected with weapons development, the 64% defence-related share may be understated.

Non federal government procurement spending is much smaller, but includes significant investment in buildings, construction (federal and non-federal governments accounted for roughly 26% of total construction and repair activity in the US in 1997).

FEDERAL PROCUREMENT SPENDING BY AGENCY, FY2010

Federal agency
DEFENSE AND NONDEFENSE PROCUREMENT SPENDING, FY2010

FEDERAL SPENDING BY NONDEFENSE AGENCY, FY2010
These procurement data exclude DARPA and SBIR

> Defence Advanced Research Projects Agency (DARPA) supports basic research and technology development (often including prototype development and testing).

- FY2010 budget of roughly USD 3 billion, less than 1% of annual defence-related procurement.

- DARPA supports the development of technologies that may/may not result in procurement purchases by military services.

> The Small Business Innovation Research (SBIR) programme funds R&D (including technology development), rather than procurement.

- SBIR is a ‘set-aside’ of 2.5% (rising to 3.5% by FY2020) of 11 federal agencies’ R&D budgets for SMEs (<500 employees).

- Estimated FY2005 spending = USD 1.8 billion.

- DoD, NIH, NASA, NSF, DoE accounted for 97% of total SBIR spending as of 2005.

- No explicit link to sponsor-agency procurement.

FEDERAL GOVERNMENT EXPENDITURE, ANNUAL AMOUNTS BY MAJOR OBJECT CATEGORY: FISCAL YEARS 1983–2010

Source: U.S. Census Bureau, Consolidated Federal Funds Report for Fiscal Year 2010
Where has federal procurement played a role in innovation?

> Most federal procurement involves purchases of artefacts for specialised government missions.

• Defence-related procurement provided demand-side ‘pull’ that complemented R&D.

• In some technologies, defence-related procurement accelerated innovative progress and adoption in the overall economy.

> Less common are policies designed to use government purchases of new technologies with civilian applications to accelerate innovation and adoption.

• Small number of examples in energy.

• Other demand-side policies have been more important in energy innovation and adoption (CAFE standards, biofuels mandates, and feed-in pricing for alternative energy sources).

How does procurement affect innovation & adoption?

> Government may be a ‘lead customer’, making large purchases of a new technology or product at an early stage in its development.

> Several types of benefit associated with ‘lead customer’ procurement by government:

• substantial early purchases -> producers can exploit production economies of scale;

• production-related learning effects -> reductions in production costs and prices, as well as improvements in product quality;

• learning in use -> incremental improvement in performance, applications knowledge.

> Collectively, these benefits can accelerate improvement in price/performance ratios, supporting broader adoption by non-government users, expansion of the ‘installed base’, and more rapid learning in use.

How does procurement affect innovation?

> Procurement may support entry by new firms, enhancing competition and (potentially) accelerating price reduction, innovation, and improvements in products.

• Procurement contracts act as a ‘prize’ for developers of new technologies, not all of whom may receive R&D support.

> Procurement may ‘legitimise’ product standards, expanding markets for suppliers of complements, and thereby accelerate adoption.
Procurement thus can accelerate both technological improvements and technology adoption in the overall economy.

But the magnitude of these procurement-driven benefits depends on broad similarity between the technological characteristics of products developed for government users and those used in non-government applications.

**Defence-related procurement policy influenced IT industry structure**

Procurement in semi-conductors and computers triggered substantial entry.

- In 1959, ‘new firms’ in semi-conductors received 22% of federal R&D contracts, yet accounted for 63% of industry sales, 45-50% of which went to the military.

- Flamm (1987): 80 firms entered the US computer hardware industry during the 1950s, virtually all of whom focused on military market.

Procurement policy reduced entry barriers and supported inter-firm flows of knowledge and know-how, especially in the nascent semi-conductor-components industry.

- Department of Defense awarded contracts to vertically specialised ‘merchant’ producers, influencing the long-term evolution of US industry structure.

- Department of Defense orders enabled entrants to reduce costs and penetrate civilian markets.

- ‘Second-sourcing’ procurement requirements accelerated inter-firm technology flows.

- Competitive procurement programmes were facilitated by large scale, making it possible to purchase new products from more than one supplier.

**The declining influence of US military procurement within IT**

By the late 1960s, a decline in government procurement as a percentage of overall demand and increased divergence between civilian and military functional requirements -> reduction in military procurement’s influence on innovation.

- Federal share of stock of US computers declined from roughly 70% in the early 1950s to 30% by the mid-1960s (Flamm, 1987). But the federal share of annual sales remained significant in high-end computers (40% in 1972, 13% in 1980).

  - Similar trends in semi-conductor sales (Figures).

- Military SW demand, which motivated the 1958 development of COBOL, by the 1980s was insufficient to establish ADA as a ‘military standard’ SW language.
3. Innovative Public Procurement

- ‘Very High-Speed Integrated Circuits’ (VHSIC) programme, launched in the 1980s to encourage development of ICs for military applications, was unsuccessful.

- By the early 1990s, Pentagon procurement officials shifted from ‘military-spec’ to ‘COTS’ (civilian off-the-shelf) product specifications in some areas, recognising that civilian technologies were advancing more rapidly and were less expensive than those developed specifically for some military applications.

**GOVERNMENT PURCHASES OF SEMICONDUCTOR DEVICES AS SHARE OF TOTAL SHIPMENTS**

**GOVERNMENT PURCHASE OF INTEGRATED CIRCUITS AS A PERCENT OF TOTAL SHIPMENTS**
Military procurement and innovation in other sectors:

- Military procurement was less successful in catalysing civilian innovation in other sectors:
  - numerically controlled machine tools: US suppliers of advanced NC machine tools to the US Air Force were ill-equipped to address competition from non-US suppliers in less complex products;
  - civilian nuclear power: US Atomic Energy Commission programme for the development and procurement of light-water nuclear-submarine reactors established this technology as a ‘dominant design’ within the US electric-utility industry.
    - However, safety and cost problems limited adoption of this technology.

- Do limited civilian benefits reflect the fact that procurement in these technologies involved complex systems rather than components? Or do these failures reflect greater divergence between civilian and military requirements?
  - Highlights difficulty for US Government in anticipating civilian user requirements for new system-level technologies.

Procurement and innovation in energy technologies

- US efforts to support ‘Energy Independence’, address climate change, etc., have included procurement-related components.

- Very different political and technological context from post-1945 military technology development:
  - in energy, government policy has sought to support the development of technologies with applications outside of mission agencies;
  - weaker political consensus on scale, urgency of ‘crisis’ -> unstable policy framework, characterised by fluctuating budgets and shifting priorities;
  - policy failures extend well beyond procurement.

Federal procurement & innovation in photovoltaic cells, 1978-81

- Solar PV cells benefited from (modest) federal R&D and procurement spending for space applications during 1950s and 1960s.

- The Federal Photovoltaics Utilization Program (FPUP) was authorised in 1978 with USD 98 million to accelerate innovation and adoption.
  - Appropriations for FPUP were far smaller, totalling USD 25 million.
3. Innovative Public Procurement

- Department of Energy allocated funds to other federal agencies for PV purchases.

> PV procurement justified by references to the innovative contributions of military procurement of semi-conductors.

- However, military procurement of semi-conductors for military applications emphasised performance, while FPUP sought low purchase cost.

- FPUP supported purchases of PV devices for federal installations (e.g. remote national parks, indigenous reservations) that were poorly suited to some commercial applications, such as central-plant power generation.

> Political controversy over federal energy policy led to the termination of FPUP in 1981.

> Despite limitations in programme design and incentives, PV procurement was associated with improvements in cost-effectiveness of PV technologies.


- Reflected more than FPUP alone.

**Federal procurement and ‘Green Buildings’**

> The US Green Buildings Council, a non-profit, non-governmental entity, developed the ‘LEED’ (Leadership in Energy & Environmental Design) standard for commercial, residential, and other buildings in 2000.

> Federal government buildings agency, General Services Administration (GSA), adopted the LEED standard for all federal (civilian) buildings (new construction and leased buildings) in 2000.

- GSA is the largest single purchaser and lessee of commercial property in US.

- Some US state and local governments have also adopted the standard for their public buildings.

> Recent research by Simcoe & Toffel (2012) suggests that adoption by federal, state, and local governments of LEED for buildings significantly accelerates adoption of LEED in privately owned buildings in the same geographic areas.

- LEED adoption by government has also expanded investment by construction suppliers (contractors and designers) in green-building expertise.

> Procurement-based endorsement by government agencies of a technical/design standard thus appears to have had ‘real’ effects on pace of innovation and adoption of energy-efficient building technologies.
US military has expanded support for energy/green technologies since 9/11

> One set of programmes seeks reduced reliance on fossil fuels, especially in warships, foreign deployments such as Afghanistan (New York Times, 4 October 2010).

  - The Department of Defense supports R&D for development of portable green energy sources, biofuel additives for aviation, and warship fuels.

> Other programmes focus on reducing weight and improving the performance of batteries for communications and computer equipment in the field.

> Transition to procurement à military demand for alternative-energy technologies is likely to grow.

  - The military may constitute a large percentage of demand for some innovations in the early stages of their evolution.

    - Requirements defined by performance more than purchase cost.

  - Magnitude of any ‘spinoff’ benefits for civilian innovation, adoption will depend on similarity between military and civilian users’ requirements.

Procurement policy issues

> How closely should government procurement and R&D investment programmes be linked?

  - Should the R&D performer also win the procurement contract?

  - Or should R&D and procurement be ‘competed’ separately?

    - Trade-offs between static efficiency (price competition) and loss of tacit knowledge, etc.

  - Separation between procurement, R&D competition increases potential for attracting new entrants into supply of innovative products (e.g. Texas Instruments).

> Tension between purchase-cost minimisation and support for innovation through procurement (FPUP).

> What role for prototypes in technology development & procurement?

  - Complex ‘bleeding-edge’ technology development programmes (especially for systems, such as aircraft) face huge uncertainty in performance and safety, even when CAD systems are used extensively.

  - Prototyping and testing of prototype performance can significantly reduce such uncertainty.
- But cost (time and money) of prototyping has often limited its use by the Department of Defense.

- Prototyping may be feasible for aircraft, but not for nuclear submarines.

> What types of technologies are more likely to display generic similarity between government and private-sector applications?

- Stage of a technology’s lifecycle is important, in as much as similarity in requirements may be greater at an early point in development.

- Government demand is also likely to be a larger percentage of total demand at an early point.

- Components or systems? Potential for divergence in user requirements arguably is greater for ‘systems’ than for ‘components’.

Conclusion

> Procurement policy has potential as an instrument of innovation policy.

- Close analogy between procurement and prizes.

- US military procurement has influenced adoption in the civilian economy as much as innovation.

- Experimentation by NGOs with procurement in global public health -> potential for new lessons.

> US military procurement has had positive and negative effects in ‘dual-use’ technologies.

- Military influence in IT has declined over time; does ‘green energy’ present a new opportunity for military procurement to affect innovation and adoption in the civilian economy?

- ‘Spin-off’ benefits also benefited from scale of US military procurement programmes, which enabled competition among suppliers.

> Procurement has enjoyed less success in US energy policy.

- Other demand-side policies (subsidies, mandates) arguably have been more effective in specific technologies (e.g. PV, biofuels).

> Similarity in user requirements between government and civilian applications: an important factor in the successful use of procurement in innovation policy, but difficult for government agencies to predict or manage.
Public Procurement for Innovation (PPI) or Pre-Commercial Procurement (PCP)

Charles Edquist

Definition and objectives of PPI

Public Procurement for Innovation (PPI) is when a public organisation places an order for the fulfilment of certain functions that could (probably) be fulfilled within a reasonable period of time (through a new product).

The purpose (objective, rationale) of PPI is not primarily to enhance the development of new products, but to target functions that:

- satisfy human needs; and/or
- solve societal problems.

Characteristics of PPI

- Innovation is a pre-condition for delivery of the product.
- PPI is a demand-side policy instrument in relation to innovation.
- PPI is a very powerful and targeted instrument.
- PPI must not be confused with ordinary – ‘off-the-shelf’ regular procurement – the largest part of all public procurement (19.4 % of European GDP in 2009 = EUR 2.3 trillion).

Significance of PPI

- PPI can influence the rate (‘number’, ‘speed’ and ‘importance’) as well as the direction of innovation processes: it can shape innovation, i.e. create new innovation trajectories.
- PPI has a large potential as a part of mission-oriented policies to mitigate ‘Grand Challenges’: environment, climate, energy, urban development, health, transport, defence, etc.
- In Sweden, PPI also led to a major consolidation of the supplying firms (e.g. Ericsson, ASEA/ABB) = strong ‘unintended’ effects on growth and employment.

Taxonomy of Public ‘Procurement’:

- Regular public procurement – off-the-shelf = no innovation.
3. Innovative Public Procurement

- **Public Procurement for Innovation (PPI)** – defined earlier:
  - **direct PPI**: procurer is the buyer = mission needs;
  - **catalytic PPI**: procurer is not the buyer but serves as a catalyst for buyers = non-mission needs;
  - **pre-Commercial Procurement (PCP)** – no buyer of products = not PPI, but procurement of (expected) R&D results = pre-competitive public R&D funding that is targeted.

**Two paths forward:**

- Improvement of **rules** that govern innovation procurement.
- Actually **practising** innovation procurement.

**Procurement rules**

- One important innovation policy task is to **create an institutional framework** that facilitates and supports innovation.
- **Interactive learning** and communication is crucial for innovations – in particular with regard to innovation procurement.
- The EU procurement rules have actually **inhibited innovation** by maximising competition rather than enhancing interaction (and thereby supporting innovation).
- Critique has led to **some changes**: now some dialogue (information exchange) between procurer and supplier is allowed and further changes are planned for 2013.
- The features of regular procurement and innovation procurement are **qualitatively** different.
- **Therefore: There should be separate rules!**
- The specific rules governing innovation procurement should **enhance collaboration for innovation** rather than maximise competition.

**The practice of innovation procurement**

- The role of the state in innovation policy is **also to intervene directly** in innovation processes.
- This means influencing innovation through policies related to **determinants** of **innovation** processes, such as R&D, **education**, **financing**, **incubation**, etc.
- PPI (and PCP) is a **public activity** (on the demand side).
Investments in PPI (and PCP) should be enlarged to mitigate global challenges – through solving societal problems and satisfying needs.

These will not be solved/satisfied by private organisations because of the large uncertainties involved.

This might include the creation of very large PPI and PCP projects of similar size and significance as:

- the Manhattan project;
- the ‘Man on the Moon’ project;
- large defence ‘PCP’ funding as in the US;
- hosting the Olympic Games; and
- the projects leading to the consolidation of Ericsson and ABB (somewhat smaller, but with very large consequences).

Translate problems/needs into demand through functional specification – very demanding; must not specify too much!

Which kind of instrument is best for what?

- PPI (direct, catalytic)
- PCP
- Regular

Who (EU, countries, regions) can best do what kind of procurement?

Transforming regular procurement into PPI:

Regular procurement is enormously large – 19.4% of GDP in the EU, EUR 2.3 trillion – but has nothing to do with innovation.

If 10% can be transformed into PPI, the element of innovation would lead to better results for the procurer in the long run, in terms of needs satisfaction and solving societal problems (but higher costs and larger efforts in the short run).

PPI is as useful as Keynesian demand management

Innovation procurement may mean extra spending, i.e. a Keynesian injection in the economy.
But PPI and PCP also mean increased functionality, i.e. solving societal problems and satisfying demand not otherwise addressed – the economy is enlarged.

See earlier: the creation of growth and employment at Ericsson and ABB thanks to PPI.

PPI is even more important than Schumpeterian creation

- PPI/PCP is also Schumpeterian creation (to follow the phase of destruction).
- PPI/PCP creates dynamism not achieved by private organisations, but by public absorption of uncertainties.
- This is more than business cycle policy and is likely to create new growth areas – where Europe can get a head start in relation to other parts of the world.

Policy Instrument Mix

- PPI can be a part of a demand-side innovation policy that supplements supply-side innovation policy instruments – into a holistic, ‘broad-based’ policy.
- PPI should be part of a policy mix to mitigate Grand Challenges – but the different policy instruments should not be mixed up!

References

4. The Innovation Divide: What Policies for Cohesion Countries?
Growth Impeding (Obstructing) Innovation: The Case of Greece

Lena Tsipouri\(^{(1)}\)

The background

\(\checkmark\) Greece is the 27th richest country in the world.

\(\checkmark\) Its economic development follows a peculiar history, as the country has grown ‘in episodes’ throughout the existence of the modern Greek state, alternating between outperforming and underperforming compared to the EU average.

\(\checkmark\) Greece joined the EU (the then EEC) in 1981.

\(\checkmark\) It has benefitted from significant regional development aid since the 1990s.

\(\checkmark\) However, this aid did not help transforming the productive sector into economic sustainability.

The current economic analysis

\(\checkmark\) The worldwide 2008 financial crisis produced an asymmetric shock for the country, revealing significant and chronic structural deficiencies.

\(\checkmark\) This has resulted in a serious contraction of GDP and record levels of unemployment, which could not be prevented by consecutive rescue packages (MoUs) agreed with the European Commission, the ECB and the International Monetary Fund – IMF (Troika).

\(\checkmark\) At the end of 2011, GDP per capita was at EUR 18 500 million, compared to EUR 19 600 million at the end of 2010 (5.6 % decrease). Annual GDP had decreased by 1.4 % in the period 2007-11, compared to a 5.6 % increase in the period 2002-07.

\(\checkmark\) At the end of August 2012, the long term unemployment rate was at 24.8 % in Greece, compared to circa 11 % at the beginning of the crisis and 11.2 % in the EU-17 and 10.3 % in the EU-27.

\(\checkmark\) Total number of unemployed exceeded 1.2 million in 2011.

\(\checkmark\) A further deceleration of economic activity is expected in the next three years, as a third MoU has been agreed with the EU, the ECB and the IMF, resulting in additional wage cuts and a rationalisation of employment conditions in state companies.

\(^{(1)}\) i4g, University of Athens, Department of Economic Studies, Greece.
The Greek financial crisis is only the tip of the iceberg and could have easily been foreseen and addressed before growing out of control, had early warning signals on the trends of the structural characteristics of the economy been taken into consideration.

Throughout the growth period, manufacturing and exports were and remained persistently and significantly below the EU average.

Manufacturing represents less than 10% of GDP and diminished systematically since 2005 (first date with data availability) with the exception of a slight increase in 2008.

Foreign direct investments have been the lowest in the EU-15 and have declined during the convergence period. At the same time outward investment has increased.

<table>
<thead>
<tr>
<th>Year</th>
<th>EU-27</th>
<th>Eurozone</th>
<th>Greece</th>
<th>Competitiveness ranking</th>
<th>Greece-Eurozone</th>
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<tbody>
<tr>
<td>1998</td>
<td>2.80%</td>
<td>2.60%</td>
<td>2.80%</td>
<td>44</td>
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<td>1999</td>
<td>2.80%</td>
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<td>3.00%</td>
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<td>2000</td>
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<td>3.40%</td>
<td>4.10%</td>
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<td>2001</td>
<td>1.90%</td>
<td>1.50%</td>
<td>3.90%</td>
<td>36</td>
<td>2.00%</td>
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<tr>
<td>2002</td>
<td>1.00%</td>
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<td>3.10%</td>
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<tr>
<td>2003</td>
<td>1.00%</td>
<td>0.10%</td>
<td>5.60%</td>
<td>35</td>
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<tr>
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<td>2005</td>
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<td>2008</td>
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<tr>
<td>2009</td>
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<td>-4.70%</td>
<td>-3.50%</td>
<td>67</td>
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<tr>
<td>2010</td>
<td>1.80%</td>
<td>1.70%</td>
<td>-5.20%</td>
<td>71</td>
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<td>2011</td>
<td>1.40%</td>
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<td>-7.10%</td>
<td>83</td>
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<td>2012 estimate</td>
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<td>90</td>
<td>-6.00%</td>
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<tr>
<td>2013 estimate</td>
<td>0.20%</td>
<td>-6.00%</td>
<td>96</td>
<td>-6.00%</td>
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</table>
Is the low share of exports due to low competitiveness or to complacency? The domestic market and grants offered sufficient opportunities for profit with lower risks.

The emphasis on exports after the outbreak of the crisis (despite the reduced export credits) may indicate that the second explanation is not unfounded.

### EXPORTS/GDP RATIO

<table>
<thead>
<tr>
<th>Year</th>
<th>Greece</th>
<th>European Union (15 countries)</th>
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Institutions 41 49 58 70 84 96 111
Infrastructure 34 35 45 47 42 45 43
Macroeconomic environment 94 106 106 103 123 140 144
Higher education and training 37 39 38 43 42 46 43
Goods market efficiency 53 60 64 75 94 107 108
Technological readiness 51 58 59 53 46 47 43
Business sophistication 52 62 66 66 74 77 85
Innovation 46 63 63 65 79 88 87

(2) Source: WORLD ECONOMIC FORUM DATABASE.
SCIEnTIFIC PROdUCTIOn And ImPACT\(^{(3)}\)

<table>
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<tr>
<th>PUBLICATIONS</th>
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<td>Share (%) of Greek publications in EU countries</td>
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<td>Share (%) of Greek publications in OECD countries</td>
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<table>
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<th>CITATIONS</th>
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<td>Share (%) of Greek citations in OECD</td>
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<td>0.95%</td>
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<th>CITATION IMPACT</th>
<th>2004-2008</th>
<th>2006-2010</th>
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<tbody>
<tr>
<td>Citation Impact (average number of citations per publication)</td>
<td>3.83</td>
<td>4.49</td>
</tr>
<tr>
<td>Relative citation impact of publications from Greece compared to EU</td>
<td>0.76</td>
<td>0.84</td>
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<tr>
<td>Relative citation impact of publications from Greece compared to OECD</td>
<td>0.74</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Capacity building versus capacity utilisation

- Structural indicators did not explain the good macro-economic performance.

- The strengths of the Greek performance, namely education and research could not be directed towards the productive sector. A significant brain-drain after the outbreak of the crisis is depriving the country of its major strength.

Preliminary findings of empirical research on Structural Funds impacts

- More than one third of the companies supported cannot be found among those publishing balance sheets.

- State aid is thinly spread with hardly any persistent innovators.

- Among those identified, state aid does not appear causing a statistically significant shift in their profitability or sales using two to three year time lags (this may however be related to the crisis and further work is done to control for that).

- Compared with control groups the companies supported do not seem to have been performing better on the average than their peers.

- Structural policies are guided by other than competitiveness priorities: absorption of EU Funds, short-term maintenance of employment and the broadest possible political satisfaction with spreading support thinly. Entrepreneurship and innovation are not in focus.

\(^{(3)}\) Source: Greek National Documentation Centre.
Given the bureaucracy, the role of intermediaries and allegedly corruption the best Greek companies are not among the best performers of support schemes. There may be a liquidity trap (companies interested in cash rather than growth are taking the trouble of submitting proposals, and many of them disappear after that).

Evaluations and impact assessment studies are practically absent in the country. Although the evaluation obligations to the Structural Funds are met (with delays and quality worries, but they are) there are no real assessments of longer-term impacts. Hence, it is unlikely to pursue evidence-based policies since the evidence itself is lacking.

Conclusions

- *Growth in this case obstructed innovation.* One may argue that the transfer of resources created a mutation of the Dutch disease.

- The reaction to the crisis led to significant contraction of demand. While some efforts to make it up with exports were undertaken successfully, they were insufficient.

- In particular, the credit crunch, affecting equally insolvent and solvent companies, is draining the more competitive part of the economy.

- With the combination of accumulated structural problems, no access to the capital markets and contracting GDP, Greek economic policy is called to cut the Gordian knot.

- Stabilise the economy and at the same time finance innovation-led growth and envisage behavioural change. All this, while there is limited emphasis on producing the necessary evidence to document better intervention.

Some Thoughts on EU Innovation Policies in Greece

Georges Siotis (4)

A combination of weaknesses

Greece

> Malfunctioning state, in (almost) all its facets.

> ‘Dutch disease’.

---

(4) Senior Economic Adviser, Task Force for Greece, Universidad Carlos III de Madrid, and CEPR.
EU

> Metric for performance? Objective function?

  - Need for ex-post evaluation.
    - In-house, commissioned, academics?

Evaluation?

> (Financed by 3rd CSF).

> ΤΙΤΛΟΣ: ‘SOL (Seismon On Line), Προγράμματος Διαδραστικό Πληροφοριακό Σύστημα Επικοινωνίας, Ενημέρωσης και Ευαισθητοποίησης του Κοινού σε Θέματα σχετικά με την Προστασία από τον Σεισμό’.

> ΑΝΑΔΟΧΟΣ: PC SYSTEMS Α.Ε.

> ΠΡΟΥΠΟΛΟΓΙΣΜΟΣ: 987 000.

The proposal consisted in creating websites to give early information to citizens. The web addresses mentioned in the proposal were: www.sol.gr and www.seismos.gr.

> If you type in the first entry, you get the following message:

> Bienvenue sur www.sol.gr. sol.gr offre des liens vers des sites web sur le thème ‘γνωριμίες’.

> For a long time, seismos.gr (the second entry) did not exist. Now it does, but it is presented as a service of ‘mykosmos.gr’, which is simply a commercial information aggregator.

> There is no mention to the 3rd CSF (maybe it is because one would really wonder why EUR 1 million of public money was necessary to fund seismos.gr. Or maybe because this page has nothing to do with the initial project).

Some challenges

> Requirement to provide bank guarantees imposed by the Greek Finance Ministry risk driving away SMEs from EU funded innovation projects.

> Excellence?

  - Proper and systematic evaluation of research institutes and universities/departments (e.g. RAND Report).

  - Greece does rather well in terms of science indicators (e.g. captures a large share of EU research funding in view of its size, decent scientific publication record).

  - ERC experience.
Possible avenues to explore

> Existing research institutes could be re-grouped along the lines of a French-like CNRS (or a reduced number thereof) and relations with universities could be institutionalised. Could be an opportunity to create more flexible structures.

> Research institutes could be geographically clustered to achieve critical mass and achieve savings in fixed costs (e.g. benefit from shared infrastructure). Such a ‘research campus’ could also host enterprise incubators, or more generally, attract research-oriented firms in its vicinity.

- Attica Science and Innovation Campus project. A Greek version of Berlin’s Adlershof?

> Public procurement: currently, Greece does not have the ability to emulate ‘smart’ procurement strategies. The time taken to complete a procurement procedure is longer in Greece than in any other Member State apart from Malta. Numerous opportunities to stall the procedure via court appeals. More than 5 000 procuring bodies. Greece has yet to develop a national e-Procurement infrastructure.

> Inducement prizes? (Innovation understood in a broad sense).

> Obtaining a Greek patent is ‘cheap’. However, if after 18 months it is not turned into an EPO or Triad patent; it can be freely copied outside Greece (→ prefer for trade secrecy).

> EPO patents are beyond the reach of many Greek firms or even research institutes.

> One avenue worth exploring would be to have an agency responsible for pooling patents and screen them. For the most promising ones: IPRs.

> Revenues generated by the few successful patents would cover the agencies’ costs (and share the revenues between the agency, the inventor, and the institute/university according to a predetermined formula).

> The UK experience (BTG) could be used as a model.

Concluding remarks

> Need to go beyond ‘business as usual’.

> In any event, avoid the ‘saupoudrage’ or ‘café para todos’. Next programming period?

> Importance of evaluation.
5. Finance for Innovation and Growth
Financing for Innovation: Addressing Europe’s Early Stage Venture Gap

Reinhilde Veugelers(1)

Why we care about VC

> Remedying the European Union’s deficient overall business research and development performance will require more emphasis to be put on nurturing more new firms in new sectors, enabling them to grow to leading-innovator status (2).

> The specific barriers faced by these companies need to be addressed. This includes addressing their access to external finance.

> On the funding escalator, VC is a critical finance source at the early phase of commercialisation and growth.

> The VC market has been crisis hit, particularly in Europe and for the higher risk early-stage projects (3).

Specifics of early-stage VC funding

> Skewedness on the demand side: The number of companies looking for equity finance is a relatively small percentage of the total company population: ‘aspiring Yollies’.

> Skewedness on the supply side: Net returns result from the realisation of a small minority of exceptional investments within the portfolio.

The VC market

> Two tyrannies (G. Murray):

  * project risk;

  * scale-related costs (fixed costs of due diligence, deal negotiation and deal involvement).

> Only sufficiently developed (‘thick’) VC markets can build the critical scale and expertise needed to overcome these tyrannies and avoid an early stage VC gap.

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(1) i4g, Professor at KU Leuven, Senior Fellow at Bruegel.
(3) See OECD, 2012, STI report.
Public intervention for VC in Europe

> Developing a viable ‘thick’ VC market is a long-term project: no quick fixes.

> In early stages, high vulnerability for (crisis) shocks.

> Beyond the quantity of VC available, what matters more is how effectively the market allocates funds to the most promising projects: ‘smart’ VC funding, which requires ‘thick’ markets.

> Government should not replace/crowd out, but instead leverage private market forces.

To address Europe’s thin market for early-stage VC effectively, public intervention should:

> be embedded within a broader innovation policy to ensure a sufficient supply of profitable projects to fund;

> be an interconnected set of policy instruments at each stage of the ‘funding escalator’ where there is a market failure:
  - complementarity with public R&D grants, support for angel funding, loans, etc.

> Not fall into the ‘local is beautiful’ trap: an integrated and open EU VC market:
  - remove barriers to operate at European scale;
  - remove barriers for global operations (in- and outward).

> Not fall into the ‘small and short is beautiful’ trap. Small funds are often not viable and have insufficient financial resources to cover their high fixed costs (especially expert management), diversify their portfolios or provide the follow-on funding to the most promising investments in their portfolios:
  - remove barriers to grow for VC firms.

Suggestions for EU-level interventions

> Supporting Member State initiatives:
  - the EU level can provide to Member States a larger arena for policy learning; diffusion of best practices;
  - state aid framework.

> Re-aligning existing EU instruments into a holistic policy framework:
• the EU has in place a number of instruments and initiatives, such as loans from the EIB’s Risk Sharing Finance Facility, and Framework Programme project funding;

• these instruments should be redesigned as part of a holistic approach to better serve the funding escalator.

> Closing gaps in the funding escalator with new EU initiatives.

Suggestions for new initiatives at EU level

> Grants for Yollies to bridge the lab-to-market gap\(^{(4)}\):

• currently in development at DG RTD;

• see also ERC, Prototype Funding Scheme;

• implementation should ease transition to follow-up VC funding (certification).

> A fund-of-funds to leverage Europe’s early-stage VC market.

• When the European Commission is proposing a fund-of-funds, as part of the Horizon 2020, it should get a clear mandate for a targeted temporary stake-taking in private VC firms in Europe, who have the potential to grow to critical scale and contribute to building a ‘thick’ European VC market.

• To avoid overlap, it should be aligned with EIF activities.

The Role of Public Capital in Financing Innovative Companies: Shifting from Venture to Seed Capital Investment

**Andrea Bonaccorsi\(^{(5)}\) and Marco Montaina\(^{(6)}\)**

Main reasons for the ‘equity gap’ for start-up companies in Europe

> The secondary market (for unlisted companies) is small, illiquid and still fragmented across Member States.

> Bankruptcy law places a considerable risk on board members of the companies.

---


\(^{(5)}\) I4g, University of Pisa, Italy.

\(^{(6)}\) Association of Italian Private Equity and Venture Capital.
Fiscal fragmentation among national markets.

Entrepreneurial culture not oriented towards growth.

Absence of a fully integrated Common Market in some strategic areas for final products (see for example the Report of the Expert Group on ‘The future of community research policy’).

We suggest the single most important factor is the weakness of the Seed Capital sector.

Seed Capital:

- concentrates on the very early stages of young innovative companies, which are characterised by high levels of investment risk;
- is aimed at supporting companies in moving from the idea or prototype stage to the first commercial revenues;
- offers limited amount of equity capital (typically in the range of EUR 200-300,000 and usually not beyond EUR 500,000).

Business angels – good solution but not enough

Seed Capital investments are often performed by business angels, which are normally considered to be part of the VC market, as private actors.

While this is partially true, it also has to be considered that, due to generous fiscal policies on capital gains, business angels tend to be, de facto, private agents of a public principal.

Business angels alone cannot provide the large scale Seed Capital investment currently needed in Europe.

The role of the public sector

- Recognition of a market failure
- Regional, national and EU policies have mobilised resources to support the emergence of a Seed Capital sector.

Dominant model

- Public-private partnership.
- Provision by the public side of equity capital to be invested into an investment fund, to be managed by a financial intermediary specialised in VC.
- Public participation to the ownership of the financial intermediary, typically with membership on the Board.
Various pro-private market clauses (e.g. recognition of advance distribution of earnings, safety nets, differential rates of return to the investment).

Partial eligibility of management expenses with respect to public schemes (e.g. EU funding).

Overall goal: to raise the (implicit) rate of return of operations at the early stage.

Limitations of the public-private model

Operational model of VC management companies means:

- top professional people;
- high costs for compliance to financial regulation;
- high fees for legal services;
- very high fixed costs; and
- expensive due diligence procedures.

Structurally oriented towards ventures that imply:

- large markets;
- high growth rates;
- high but computable risk;
- relatively mature opportunities;
- the availability of public capital does not result in orientation towards investment in the early stage (=small scale, high risk, immature projects), but in increasing the expenses for the selection of projects that are consistent with the VC operational model;
- slow decision-making process;
- high transaction costs between public and private actors; and
- (sometimes) interference of political considerations at the project selection stage.

From horizontal to vertical division of labour between public and private

The public-private VC model is a horizontal division of labour: the private and public sectors intervene at the same level of the value chain.
But this model does not work appropriately.

The availability of public capital does not change the structural orientation of VC management companies to invest into relatively large, mature, high-growth opportunities.

Seed Capital remains largely unexploited.

**Need to switch to a model of vertical division of labour**

The public sector specialises in the Seed Capital segment, investing public resources only.

However, the public sector adopts efficient management models.

The output of the Seed Capital cycle, managed with public resources, is the input of the VC cycle, managed entirely with private resources.

**An operational model for public Seed Capital**

A Seed Capital Fund (SCF) is created with public resources.

The management is delegated to an investment vehicle.

The investment vehicle would be required to respect a number of conditions, including:

- invest only in **equity or quasi equity instruments** that are directly issued by young innovative companies in the seed capital phase;

- take only **minority stakes** in the target company;

- do **not** ask for a position on the **board** of directors of the target company;

- prior to investing, require all shareholders of the target company to sign an **agreement** according to which they are bound **to repurchase the Seed Capital Fund stake** after a given period (e.g. three years from the investment, with a possible postponement for given reasons up to five years);

- the agreement must be signed by all shareholders **in solidarity** (in order to avoid adverse selection and moral hazard);

- do **not** invest with the goal of making **profits**, and

- do not invest more than EUR 500 000 for each target company.
Due diligence

The selection of young companies will be carried out on the basis of a simplified due diligence that will, however, take into consideration all elements of the business plan and also the potential for future funding steps. The service will be provided at a fraction of the market cost.

The due diligence process would be carried out by a team of professional evaluators and firms of proven experience in the relevant sectors, compensated on a fee basis.

The public body setting up the SCF will contract the due diligence team through an umbrella agreement following a public evidence procedure.

The SCF will monitor the accounts of target companies by appointing one member within the accounting certification board.

Price of repurchase of shares

Depending on the circumstances, the price of repurchase can be either fixed in advance, which is the most favourable option to the entrepreneur, or ex-post, according to clear accounting rules defined in advance (option most favourable to the vehicle).

In the case of an ex-ante definition of the price, there might be an element of state aid, to be evaluated according to the regulation.

Evaluation of goodwill

Considering that young innovative companies are often brain-intensive and, consequently, their intangible assets are difficult to evaluate legally as part of the equity capital or collateral, the SCF could accept a dilution of its share, following a procedure of evaluation of goodwill.

Legal discipline of the Seed Capital Fund

Since the SCF does not raise funds with the intention to deliver an investment return or profit to its investors, it would not, at least in theory, qualify as an Alternative Investment Fund, thus falling outside the scope of both the AIFMD and the VC regulation (which applies to the same category of funds).

The SCF will, however, still qualify as a collective investment undertaking with a defined investment policy, and it will be subject to national supervision authorities and juridical frameworks.

When considering the optimal regulatory framework of the SCF, it is important to take into consideration the specific characteristics and operating conditions of Seed Capital vehicles.

Since these funds usually manage (and invest) a limited amount of capital, they pose a nearly non-existent systemic risk. Because of their small dimensions, such vehicles greatly benefit from a light and flexible management structure.
Smart, Inclusive, and Sustainable Growth: Risks and Rewards in Innovation

Mariana Mazzucato(7)

Why were the 1990s so smart but not inclusive?

> Growth: real per capita productivity gains (from smart growth) that can raise *standards of living*.

> Equity: gains from growth *shared fairly* among those who contribute to it.

> Stability: employment and income that is not subject to *boom and bust*.

> Sustainability: growth that is *environmentally friendly* and also replicable.

**Punch-line:**

We need *specific mechanisms* to allow this; it will not happen on its own.

**UNITED STATES: ECONOMIC GROWTH**

Real GDP per capita, 1960-2009

(7) i4g, University of Sussex – SPRU, UK.
THE GREAT U-TURN
Gini coefficient for all US families, 1947-2009

UNSTABLE GROWTH 1960-2009
United States, annual growth rate, real GDP per capita, 1960-2009
Innovation and Inequality

1. Classical Economists (Ricardo: Chapter on Machinery) paid attention to effect of mechanisation on profits/wages.

2. Skill biased technological change (Acegoglu 2002). But where do skills come from? No theory of innovation. No theory of the top 1%.


Not enough attention has been paid to the tension between how value is created and how value is extracted in modern day capitalism.

Implications for dysfunctionality of innovation 'eco-systems'.

Risk-Reward Nexus

Characteristics of innovation and dynamics of inequality (Lazonick and Mazzucato, 2012):

> Uncertain (Knight, 1921).

> Collective (Systems of Innovation).
Cumulative (dynamic returns and path-dependency):

- uncertainty: Investments in innovation entail risk-taking.

- who takes the risk? Innovation is collective: need to examine who invests in innovation in this collective process.

- who gets the rewards? Innovation is cumulative: creates the opportunity for parties who did not take the risks to reap the rewards.

UK FINANCIAL INTERMEDIATION AND AGGREGATE GROSS VALUE ADDED


The Entrepreneurial State

- Government does not only ‘fix’ markets but does what private sector is not willing to do.

- Catalyst, and lead investor, sparking the initial reaction in a network. Creator not only facilitator of knowledge economy.

- Mission oriented (Mowery 2010).

- Engaging with very high risk, uncertainty, radical change.

- Courageous, but a bit naive on the returns.
Who takes the risks, who gets the returns?

A new pharmaceutical product that brings in more than USD 1 billion per year in revenue is a drug marketed by Genzyme. It is a drug for a rare disease that was initially developed by scientists at the National Institutes of Health. The firm set the price for a year’s dosage at upwards of USD 350 000. While
legislation gives the government the right to sell such government-developed drugs at ‘reasonable’ prices, policy makers have not exercised this right.

The result is an extreme instance where the costs of developing this drug were socialised, while the profits were privatised. Moreover, some of the taxpayers who financed the development of the drug cannot obtain it for their family members because they cannot afford it. (Vallas et al. 2011).

INNOVATION IS COLLECTIVE, UNCERTAIN AND CUMULATIVE

Capturing the rewards

> Certain parties position themselves to reap rewards far beyond the risks that they have taken, with direct access to returns in product markets or to gains on financial markets.

> Top executives: stock-based compensation that depends on control of corporate boards and stock-market manipulation.

> Venture Capitalists: exit on the speculative stock market (NASDAQ), often with P/LIPOs (product-less IPOs) – equity investors often take capital gains even when the venture generates no products, let alone profits.

> Private equity firms: load up industrial firms with debt, pay themselves dividends, fire workers, and make ‘a killing’.

> Hedge funds: 2/20 system for managing other people’s money – fund managers can win even when investors lose – and even when investors win, rewards hugely disproportionate.
What sort of innovation ‘eco-system’?

*Parasitic vs. symbiotic.*

**What to spend profits on? R&D or stock price?**

In 2011, along with USD 6.2 billion in dividends, Pfizer repurchased USD 9 billion in stock, equivalent to 90% of its net income and 99% of its R&D expenditure. While consumers pay inflated price for drugs, big pharma allocates billions to buy-backs, and then finds that it does not have new blockbusters in the pipeline to replace those whose patents are now expiring.

Amgen, the largest dedicated biopharma company, has repurchased stock in every year since 1992, for a total of USD 42.2 billion through to 2011, including USD 8.3 billion in 2011. Since 2002, the cost of Amgen’s stock re-purchases has surpassed the company’s R&D expenditures in every year except 2004, and for the period 1992–2011 was equal to fully 115% of R&D outlays and 113% of net income (source: Lazonick and Tulum, 2011).

And it is happening again... in green-tech!

The American Energy Innovation Council (AEIC) has spent a total of USD 237 billion on stock repurchases between 2001 and 2010.

However, in 2010 the AEIC asked for three-fold spending on clean technology to USD 16 billion annually, with an additional USD 1 billion given to the Advanced Research Projects Agency for Energy (ARPA-E).
The major directors of the AEIC hail from companies with collective 2011 net incomes of USD 37 billion and R&D expenditures of approximately USD 16 billion. That they believe their own companies enormous resources are inadequate to foster greater clean technology innovation is indicative of the state’s true role as the first driver of innovation. (Mazzucato, 2013 forthcoming).

Risks and Rewards

Moving beyond eco-system hype (old wine in new bottles) to a division of innovative labour, and getting something back.

Can ‘tight’ EU budgets afford to invest in risky innovation? How to reconcile investment (in expensive and risky R&D) with the ‘golden rule’ of deficit reduction?

Nokia vs. Google

When SITRA, the Finnish Government’s public innovation fund, provided the early-stage funding for Nokia, it later reaped a significant return on this investment – a fact accepted by the Finnish business community and politicians.

The reason why the US Government has not reaped a return from its early-stage investments in companies such as Google (which benefitted from a state-funded grant for its early algorithm) and other such success stories including Apple, Intel and Compaq (which received public SBIR funding) is due to the lack of understanding in the USA, and many other economies, of state-led growth-inducing investments, which allow conservative forces to portray the state as only a menace in the economy.

Creative thinking on tools to claim back returns

- Innovation ‘fund’ that firms pay into
- IPR golden share
- Income contingent loans
- Public VC (reinvested back), e.g. SITRA
- Shares
- National Investment Bank (e.g. Brazil’s BNDES, 21% return on equity).

Lazonick and Mazzucato (2012), Risks and rewards in the innovation-inequality relationship, FINNOV DP 2.11.
6. Annexes
Innovation for Growth – i4g
Relation of research and innovation with smart, sustainable and inclusive growth

Programme

i4g Research & Innovation Policy Workshop
‘Innovating out of the Crisis’
Wednesday, 28 November 2012

Venue
Berlaymont Building
Rue de la Loi 200
1040 Brussels
3rd floor, room 3

8:45-9:15 Registration and Coffee

9:15-10:45 1. Opening session & key note: ‘Innovating out of the Crisis’
Chair: Clara de la Torre (DG Research & Innovation, Director C)
➔ Welcome address, Clara de la Torre (DG Research & Innovation, Director C)
➔ Opening statement from Commissioner/Cabinet: ‘The economics of innovation and the quest for new ways to smart, sustainable, and inclusive growth in Europe’, John Bell (Head of Cabinet Research & Innovation)
➔ Key Note: ‘Innovating out of the Crisis’, Luc Soete (ERIAB Chair)
➔ Discussant: Martin Larch (DG ECFIN)
➔ Open Discussion
➔ Concluding remarks (implications for RDI policy making):
  Pierre Vigier (DG RTD C.6)

10:45-11:00 Coffee Break

11:00-12:45 2. Innovative Public Procurement
Chair: Frédérique Sachwald (i4g member)
➔ Presentation of the i4g Policy Brief on public procurement, Lena Tsipouri (i4g chair)
➔ A US contribution on Public Procurement of Innovation, David Mowery (University of California at Berkeley)
➔ Discussants: Charles Edquist (Lund University), Jaroslav Kracun (DG MARKT C.3)
➔ Open Discussion
➔ Concluding remarks (implications for RDI policy making):
  Peter Droell (DG RTD C.1)
12:45-13:30 Lunch Break

Chair: Andrés Rodriguez-Pose (i4g member)
➔ Presentation of the i4g Policy Brief ‘Innovation in cohesion countries: the case of Greece’, Lena Tsipouri (i4g chair)
➔ Observations from the European Commission’s Task Force for Greece, George Siotis
➔ Discussants: Mikel Landabaso (DG REGIO), Gianluca Spinaci (Committee of the Regions)
➔ Open Discussion
➔ Concluding remarks (implications for RDI policy making): Dimitri Corpakis (DG RTD C.5)

15:15-15:30 Coffee Break

15:30-17:30 4. Finance for Innovation & Growth
Chair: Maureen McKelvey (i4g member)
➔ Presentation of the i4g Policy Brief on ‘Financing Innovation’, Reinhilde Veugelers, (i4g member)
➔ Presentation of the i4g Policy Brief on ‘seed capital’, Andrea Bonaccorsi (i4g member)
➔ Presentation of the i4g Policy Brief on ‘reforming finance’, Mariana Mazzucato (i4g member)
➔ Discussant: Marc Schublin (European Investment Fund – EIF)
➔ Open Discussion
➔ Concluding remarks (implications for RDI policy making): Jean-David Malo (DG RTD C.3)

17:30-18:00 Concluding Session
Chair: Lena Tsipouri (i4g chair)
➔ Take away from this workshop, point of view of the Cabinet (John Bell, Head of Cabinet Research & Innovation)
➔ Discussion on the prospective i4g work programme 2013
➔ Concluding remarks, Lena Tsipouri (i4g chair)
List of speakers

1. Opening session & key note: ‘Innovating out of the crisis’

Clara de la Torre

Clara de la Torre is Director responsible for ‘Research and Innovation’ in the European Commission. Before that, she was Director responsible for ‘Inter-institutional and legal matters related to the Framework Programme’ in DG Research also at the European Commission. Her professional career mainly focussed on research policy where she started her activities at the European Commission in 1987. She covered a wide variety of fields ranging from programme evaluation to energy research or socio-economic analysis. In the late 1990s, she dealt with ‘National Research Policies & Intergovernmental Cooperation’. She also represented the European Union in non-EU schemes such as EUREKA. She also worked at the Joint Research Centre both in Brussels and Seville, where she was advisor to the Director of the Institute for Prospective Technological Studies. Clara de la Torre has a degree in Economics and Business Administration (Specialisation in Quantitative Economics) at the Universidad Autónoma of Madrid.

John Bell

Head of Cabinet of Commissioner Máire Geoghegan-Quinn for Research and Innovation

John Bell had previously been Head of Cabinet of the Commissioner for Health and Consumer Affairs. Before that he was Head of Strategy & Analysis (Unit O2) in the Health and Consumer Protection Directorate-General (DG SANCO) of the European Commission, dealing with better regulation, future policy strategy, and modernising governance. He has been a Commission official since 1993. Since then he has worked on a range of issues from project and financial management on ex-Yugoslavia, to public administration reform across Central and Eastern Europe. As Poland Country desk officer he managed the Europe Agreement’s trade, legislative and political pre-accession relations and prepared the Commission’s Opinion on Poland’s Membership. As a member of Cabinet with Commissioner David Byrne (EU Commissioner for Health and Consumer Protection 1999-2004) he was responsible for health and enlargement issues within the portfolio. Prior to entering the Commission he completed his doctorate on cultural nationalism in Northern Ireland at St. John's College, Oxford, which followed his academic career specialising in Anglo-Irish studies at University College Dublin.
Luc Soete

Luc Soete is Rector Magnificus of Maastricht University, the Netherlands. Previously he was Director of the United Nations University research and training institute: UNU-MERIT Professor of Internal Economic Relations and Director-Dean of the Maastricht Graduate School of Governance (MGSoG) at Maastricht University. He is a member of the Advisory Council for Science and Technology Policy (AWT) and the Royal Dutch Academy of Science (KNAW). Over the past 30 years, Luc Soete has contributed as (co-)author and (co-)editor to some 11 books, 50 refereed articles and some 100 chapters in books. In 2002, he received the MSM Honorary Fellow Award, in 2007 the Belgian Commandeur in de Kroonorde and in 2010 a Doctor Honoris Causa from his Alma Mater, the University of Ghent, from which he graduated in economics. He obtained a DPhil in economics from Sussex University where he worked as senior research fellow at the Science Policy Research Unit in the late 1970s and 80s.

Martin Larch

Martin Larch is Head of Unit in Directorate-General for Economic and Financial Affairs (DG ECFIN). In April 2008, he joined the Bureau of European Policy Advisers as adviser for EU Budget Review, Economic Policy in the Economic and Monetary Union, Country Developments. He joined the European Commission in June 2000 in the DG ECFIN, where he first worked as Desk Officer for Italy, assessing the economic situation and policy of the country in the context of the EU fiscal surveillance framework. In November 2006, he was appointed Deputy Head of the Unit in charge of Public Finances in the Euro Area and the EU, where he coordinated and contributed to the production and publication of the annual Public Finances in EMU report of DG ECFIN. Linked to his activities in DG ECFIN, he has published a number of articles on fiscal policy and policy surveillance in the EU in reviewed economic journals. Martin Larch obtained an economics degree and a PhD in economics from Vienna University. He followed doctoral and post-doctoral studies at the Institute for Advanced Studies, Vienna and the European Institute at the London School of Economics.

Pierre Vigier

Pierre Vigier is Head of Unit Economic analysis and Indicators in DG Research and Innovation. Since April 2003, he has been holding positions in the European Commission related to the development of the European innovation policy, first in the Enterprise and Industry DG, then in the DG Research and Innovation. He is currently in charge of the dialogue with Member States for the Research and Innovation part of their national reform programmes, and for monitoring progress in the R&D intensity and Innovation Europe 2020 headline Innovation indicators. Pierre Vigier, holds three Master’s Degrees in Law, Economics and Political Science. A specialist in European industry and innovation, he began his career within a number of ministerial Cabinet offices in France (Prime Minister and Foreign Affairs in particular) and at the Territory Planning Agency. He joined the European Commission in 1988.
6. Annexes

2. Innovative Public Procurement

**Lena J. Tsipouri**

Prof. Dr Lena J. Tsipouri is a professor in the Department of Economic Sciences at the University of Athens and a senior researcher in the Centre of Financial Studies of this University.

**David C. Mowery**

David C. Mowery is the Milton W. Terrill Professor of Business at the Walter A. Haas School of Business, University of California at Berkeley. He is Director, PhD Program, Haas School of Business, U.C. Berkeley and Deputy Director, Institute for Management, Innovation, and Organization as well as Research Associate, National Bureau of Economic Research.

At Haas since 1988
2009-present, William A. & Betty H. Hasler Chair in New Enterprise Development
1988-present, Professor, Haas School of Business
Director, PhD Program, Haas School of Business
Deputy Director, Institute for Management, Innovation, and Organization
Research Associate, National Bureau of Economic Research
1982-1988, Assistant and Associate Professor, Social and Decision Sciences Department, Carnegie-Mellon University
1987-1988, Assistant to the Counselor, Office of the United States Trade Representative
1986-1987, Study Director, Panel on Technology and Employment of the National Academy of Sciences

**Charles Edquist**

Charles Edquist has been the Holder of the Ruben Raising Chair in Innovation Research at CIRCLE, Lund University, Sweden, since February 2003 and before that he had held a Chair at the University of Linköping. His publications include numerous books and articles on innovation processes, innovation systems and innovation policy. Of these, the edited volumes ‘Systems of Innovation: Technologies, Institutions and Organizations’ (1997) and ‘Small Country Innovation Systems: Globalization, Change and Policy in Asia and Europe’ (2008) constitute major contributions to the development of the so-called Systems of Innovation (SI) Approach. So does the chapter ‘Systems of Innovation: Perspectives and Challenges’ (2005), in the Oxford Handbook of Innovation. He has made many contributions to the field of innovation policy and governance of innovation systems, the latest being the articles in Industrial and Corporate Change (2011) and Research Policy (2012). He is among the 50 (or so) most cited innovation researchers (out of 6-7 000) in the world.
He was one of the founders of CIRCLE (Centre for Innovation, Research and Competence in the Learning Economy) at Lund University in 2004. At present, he is working mainly as a researcher and as an advisor to governments and firms on issues related to innovation policy and strategy in a wide sense.

**Peter Dröll**

Peter Dröll is Head of Unit DG RTD C1 – Innovation Policy. In 2003 he worked in the Cabinet of Commissioner Günter Verheugen. In 2004, he was appointed as Head of Cabinet of the Science and Research Commissioner Janez Potočnik (Science and Research). In May 2008, he became Head of the Innovation Policy Development Unit in the Commission’s Enterprise and Industry Department. In 1991, Peter Dröll began his career for the European Commission working in a variety of Directorates-General, including DG Financial Control, DG Environment and DG Enlargement. Peter Dröll is a lawyer by training with a PhD in German constitutional law and European law. After two years as lawyer in a regional law firm specialised on the law of contracts, he joined the European Commission.

### 3. The Innovation Divide: What Policy for Cohesion Countries?

**Lena J. Tsipouri**

Prof. Dr Lena J. Tsipouri is a professor in the Department of Economic Sciences at the University of Athens and a senior researcher in the Centre of Financial Studies of this University.

**Gerhard Stahl**

Gerhard Stahl has been Secretary-General of the Committee of the Regions (CoR) since 1 April 2004, currently in the course of his second five-year term of office (2009-14). In September 2002, he was appointed Director for Consultative Work at the CoR. He also worked in the European Parliament and on the regional level in Schleswig-Holstein at the Ministry for Economics, Transport and Research and later on as Director-General for European and International Affairs at the Ministry for European and Federal Affairs. In this role, he specialised in EU policy preparation for the Bundesrat, the German legislative second chamber, and inter-regional cooperation projects. From 1995-99, Gerhard Stahl was a Member of the Cabinet of European Commissioner for Regional Policy Dr Monika Wulf-Mathies. From 1999-2002, he was Deputy Head of Cabinet for Pedro Solbes, the European Commissioner for Economic and Monetary Affairs. He was educated in his home city and went on to graduate in economics at the Technical University in Berlin, where he had his first professional post as an assistant to the chair of public finance. He then spent three years working as an economist at the Federal Ministry of Finance in Bonn.
Mikel Landabaso

Mikel Landabaso is DG REGIO Head of Unit of thematic cooR&Ination and innovation at the European Commission. He has worked in DG REGIO since 1990, both in Horizontal Units on policy conception and in Geographical Units on policy implementation, including working as the Assistant to the Director General. Previously he was Head of the Research Department at the Basque regional development agency – SPRI. He was given the 2004 annual ‘Christiane Born Award’ by the European Regional Development Agencies Association – EURADA for his contribution to innovation in European regional policy. He has a PhD in Economics (University of the Basque Country), Diploma in Advanced European Studies (College of Europe), and MA in Development Economics (University of East Anglia). He has been a Visiting Scholar at the University of North Carolina at Chapel Hill and he was part-time professor of regional development at the Free University of Brussels and the University of Deusto.

Dimitri Corpakis

Dr Dimitri Corpakis is currently Head of Unit on Regional Dimension of Innovation. Previously, he had the same function in ‘Horizontal Aspects and Coordination’ at the Directorate ‘Science, Economy and Society’ of DG RTD. Throughout his period of work at the Commission, Dimitri Corpakis has followed closely the key issues surrounding regional aspects, employment and the Internet. An engineer by training, Dimitri Corpakis has to date more than 26 years of experience in European Affairs. Before joining the European Commission in 1990, he worked as an EU expert with the Greek Ministry of Education. His Brussels career started in 1990 (Education and Training) before moving in 1992 to the area of R&D. After an assignment with the ESPRIT Programme (European Strategic Programme for Research in Information Technologies), he moved to the R&D policy area, with personal contributions to several initiatives (moving towards e-Science, setting-up the European Research Advisory Board – EURAB, and Regions of Knowledge).

4. Finance for Innovation and Growth

Reinhilde Veugelers

Prof. Dr Reinhilde Veugelers is a full professor at KULeuven, Belgium at the Faculty of Economics and Business, where she teaches international business economics and game theory. She is a Senior Fellow at Bruegel and a CEPR Research Fellow. She was in the Chair for the first year of i4g.

Andrea Bonaccorsi

Prof. Dr Andrea Bonaccorsi is professor of Economics and Management at the University of Pisa, Italy. He is member of two High Level Expert Groups at DG RTD.
Mariana Mazzucato

Prof. Dr Mariana Mazzucato is a professor in Economics at the University of Sussex, UK, where she holds the RM Phillips Chair in Science and Technology Policy.

Marc Schublin

Marc Schublin is Director of Strategic Development and EU Policies of the European Investment Fund – EIF. Since 2005, Marc Schublin was Head of the JEREMIE Programme (Joint European Resources for Micro to Medium Enterprises), a joint initiative of the European Commission, the European Investment Bank (EIB) and the European Investment Fund (EIF) to improve SME access to finance in the framework of European regions. Marc Schublin has longstanding professional experience within the EIB. He was previously Senior Loan Officer, Deputy Head of the EIB Brussels Office and Senior Coordination Officer. From 2000 to 2005, he worked as Head of Coordination and Advisory Services for the EIF where he was in charge of relations with the Commission and the EIB, the EIF Business Plan, as well as institutional issues.

Jean-David Malo

Jean-David Malo is Head of Unit RTD-C03 ‘Financial engineering’ and the Commission’s Designated Service Manager for RSFF implementation. He graduated from the Institut National Supérieur des Sciences Economiques et Commerciales (Paris) and the University of California (Berkeley), USA. He started his career as Head of Internal Control Management in the Comité Professionnel de la Distribution de Carburants in France, before joining ARMINES, a body managing contractual research and innovation for French engineering schools (Ecoles des Mines, Ecole Polytechnique, ENSTA), where he created, developed and managed the European Affairs Directorate. Jean-David Malo joined the European Commission in January 2001.
High Level Economic Expert Group

Innovation for Growth – i4g
Relation of research & innovation with smart, sustainable and inclusive growth

1. Mission

The mandate and the mission of the High Level Economic Policy Expert Group – i4g is related to the policy implementation of the Innovation Union.

The experts shall provide the best possible advice on policy impacts of research and innovation to the Commission.

i4g will assess the socio-economic impact and the potential of research and innovation actions to deliver welfare to European citizens, and review best research and innovation cases and practices and forward suggestions for R&I policies. Tasks in detail are the following:

> Advice to the Commission on policies for research and innovation and how to turn them into growth, based on evidence and analysis from the academic literature.

> Assessment of the impact and the innovation potential of actions in the context of the Innovation Union Flagship Initiatives.

> Explore new avenues for R&I policies.

> Recommendations and suggestions on how to make the Innovation Union work at European, national and regional levels within a global context.

> Support to the Commissioner on communication and dialogue on research and innovation policies with stakeholders at European, national and regional levels.

The group will work in close interaction with the Commission services and take into account the evolving discussions at political level.

2. Involvement

Socio-economic benefits of ERA

Invitation by DG RTD to run the ERA Benefits Panel initiated by RTD B1 as a sub-group of i4g.

Participation of i4g Panel members (A. Bonaccorsi, L. Tsipouri, M. Mazzucato to give presentations to the ERA Stakeholder Conference, held 20 January 2012 in Brussels.

Report: ‘Socio-economic benefits of the European Research Area’.
AGS – Annual Growth Survey of the Commission

- Invitation to brainstorming AGS outline in Cabinet with i4g chair.
- Presentation of first draft of opinion of AGS 2012 to Cabinet.
- Informal presentation to President of the Council (Van Rompuy).
- Main contribution to workshop ‘Innovating out of the Crisis’.

3. Overview on activities

- Summing up the first year’s results at workshop ‘Innovating out of the Crisis’ held 28 November with Cabinet and selected participation of other concerned Commission services at the Berlaymont building.
- Enlargement of i4g to 15 members for second year of existence.

4. Policy Briefs

2. Public Procurement of Innovation (L. Tsipouri).
3. i4g comments on the ‘Socio-economic Benefits of the European Research Area’ report.
5. The Public Role in Financing Innovative Companies: Shifting from Venture Capital to Seed Investment (A. Bonaccorsi).
6. Innovation in Cohesion Countries: The Case of Greece (L. Tsipouri).
7. Seizing the Opportunities of Service Innovation (M. Stare).
5. Support studies for i4g policy papers

Service innovation

> Programmes to Support Research and Innovation in Services, Walter Ganz, Jens Neuhüttler, Fraunhofer Institute, IAO Stuttgart.

> Services: Innovation, Performance and Public Policy, Faiz Gallouj, University Lille 1.

> Frugal and Inclusive Innovation in India and the New Global Agenda, R.A.Mashelkar, National Laboratory, Pune, India (in preparation).

Governance of high-tech innovation

> Public Procurement of Innovation in the US, David C. Mowery, University of California, Berkeley.

> Knowledge Flows in High-tech Industry Clusters – Dissemination Mechanisms and Innovation Regimes, Bo Carlsson, Case Western Reserve University, Cleveland, Ohio (in preparation).

Globalisation of RTD and its impact for R&I policies


6. Areas of study for 2013-14 (planning)

> Globalisation of R&I, impact and European policy responses.

> Regional aspects of innovation, Cohesion Countries and strategies (How to overcome the innovation gap?).

> Inclusive Growth.

> Performance issue of the public research system.

> Service Innovation – Public sector innovation.

> Finance for Innovation and Growth.
# List of participants

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<tr>
<th>Name</th>
<th>Institution</th>
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<tr>
<td>Jutta Allmendinger</td>
<td>Innovation for Growth – i4g</td>
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<td>Manuela Arata</td>
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<td>European Research and Innovation Area Advisory Board (ERIAB)</td>
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