New Sources of Growth:

Knowledge-Based Capital Driving Investment and Productivity in the 21st Century

Interim Project Findings (as of September 2012)

1. Introduction

Investment and growth in OECD economies is increasingly driven by knowledge-based capital (KBC). In many OECD countries, firms now invest as much or more in KBC as they do in physical capital such as machinery, equipment and buildings. This shift reflects a variety of long-term economic and institutional transformations in OECD economies. The rise of KBC creates new challenges for policymakers, for business and for the ways in which economic activity is measured. Many policy frameworks and institutions are still best suited to a world in which physical capital drove growth. New thinking is needed to update a range of framework conditions – from tax and competition policies to corporate reporting and intellectual property rights. Updated policies could help yield significant economic value from forms of KBC that have thus far received scant attention, such as design and data.

Three types of KBC can be distinguished: computerised information (software and databases); innovative property (patents, copyrights, designs, trademarks); and economic competencies (including brand equity, firm-specific human capital, networks joining people and institutions, and organisational know-how that increases enterprise efficiency). Research on KBC is showing that growth can arise from previously under-appreciated sources. For instance, firms' organisational know-how – a form of KBC - can increase the value of computer assets by a factor of ten.

Across Europe, investment in KBC accounts for 20 to 25% of average labour productivity growth. In the United States, between 1995 and 2007, some 27% of growth in labour productivity resulted from business investment in KBC. Unlike physical capital, investments in many forms of KBC create spillovers of knowledge for the rest of the economy, spurring growth. The environment for investment in KBC is likely to determine which countries retain or move into the highly value-adding segments of which industries. For example, in 2006, the iPod accounted for 41,000 jobs, with 27,000 outside the United States and 14,000 inside. But US workers – where investments were occurring in forms of KBC such as design, R&D, software and marketing - earned a total of USD753 million, while those abroad earned USD318 million. Today, the value of some leading global companies resides almost entirely in their KBC. And KBC is transforming the determinants of competitive success. In the automotive sector, the cost of developing new vehicles is increasingly dominated by software, while high-end vehicles rely on millions of lines of computer code and advanced on-board processors.

To address the rise of KBC, the OECD has embarked on a two-year horizontal project, *New Sources of Growth: Intangible Assets*. For OECD member countries and key non-members this work aims to:

- Provide evidence of the economic value of KBC as a new source of growth; and
- Improve understanding of current and emerging challenges for policy, in such areas as taxation, competition, intellectual property rights, personal data, and corporate reporting.

The *New Sources of Growth* project draws on expertise from across the OECD Secretariat.

2. The growing importance of knowledge-based capital for growth

Recent research shows that:

- In many countries *business investment in KBC is growing faster than investment in physical assets*. For instance, in Japan the ratio of intangible investment to GDP has risen throughout the past 20 years.

- Overall business investment in KBC can be large. In the United States, total investment in KBC in 2007 is estimated at USD1.6 trillion, some 11.3% of GDP.

- Furthermore, *if business' investment in KBC is fully reflected in national accounting systems – which is not currently the case - then this can significantly change the observed sources of growth*. For instance, estimates for the 27 EU countries show that once KBC is properly treated as investment, measured labor productivity growth increases significantly in all countries.

- There are big differences across countries in the shares of business investment in KBC. *As a share of GDP, the business sector in richer countries invests proportionately more in KBC.*

- A variety of macro- and micro-economic studies, covering various time periods, find *a positive relationship between investment in KBC and growth, productivity change and positive business outcomes*.

- Enabling business investment in KBC has become a priority in many emerging economies. New research indicates that investments in KBC were equivalent to 7.5% of China's GDP in 2006. This rate - comparable to Germany and France – rose from 3.8% in 1990.

- *The assets that make up KBC are still poorly measured.* While some progress is occurring – in the United States in 2013 R&D will appear as an investment, for the first time, in the measure of GDP - the development of international comparative data is in its infancy.

3. Policy perspectives

Business investment in KBC underpins the entire knowledge economy. Many areas of policy affect these investments, from framework and regulatory policies to targeted investment support. This section reviews preliminary policy insights from the *New Sources of Growth* project, while describing work in progress and future analytic challenges.

Tax policies will likely need review: to support competitiveness and encourage R&D many governments subsidize R&D expenditure and limit tax on income derived from KBC. But cross-border tax planning by multi-national enterprises (MNEs) may result in effective tax rates (ETRs) on R&D well below intended levels. Moreover, tax systems may be encouraging the migration of KBC to offshore holding companies, and the use of KBC in foreign rather than domestic production, weakening the original rationale for tax incentives for R&D. The OECD is developing new ETR measures to provide guidance on a range of tax policy choices.

Competition policy analysis must evolve: many competition agencies are wrestling with the analysis of competitive behaviour in the digital economy, where entirely new sectors and business practices (highly reliant on IP) are rapidly emerging. OECD is assessing competition policy challenges in the digital economy and the broader issue of IP and competition. Early work suggests that in the digital economy the most significant competition takes place between companies using very different business models. Competition *among* platforms is more important to innovation than competition *within* platforms, so competition authorities should give priority to the former type of competition issues. Eliminating anti-competitive product market regulation, and enforcing competition rules, are also fundamental.

Intellectual property rights (IPRs) are key: the *New Sources of Growth* project is highlighting the central importance of IPRs. A number of OECD countries have begun comprehensive reviews of their

IPR frameworks, and debates on IPR have assumed new prominence in the economics press. While IPR frameworks differ significantly, concerns exist in many countries over the erosion of patent quality, the creation of incentives for litigation, delays in awarding patents, an overly broad extension of the patentable domain, and the activities of 'patent trolls' (firms that do not make, own or provide their own products or services, but instead purchase patents and file resource-consuming lawsuits against companies alleged to have infringed those patents). The work on KBC also goes beyond patents, drawing attention to the importance of copyright and design.

Facilitating entrepreneurial activity is essential: a dynamic process of firm creation and exit will facilitate resource reallocation to new sources of growth based on KBC.

Governments will need to ensure good conditions for the financing of KBC-intensive firms: specialised financial intermediaries – such as venture capitalists and business angels – are important in allocating capital to fast-growth KBC-based firms and in matching such firms to larger incumbents with strengths in commercialising inventions. But significant cross-country differences exist in the supply of seed, early stage and venture capital investments.

Improved corporate reporting could help: when firms provide investors and analysts with information on investments in KBC the exercise of ownership rights is strengthened, management and boards are subject to greater discipline, and valuation becomes more efficient. Industrial sectors more dependent on external finance grow faster in countries with higher quality corporate disclosure regimes. But accounting frameworks are unsuited to the reporting of spending on KBC. Reforms have focused on narrative disclosure frameworks. But these have not been widely implemented, and few OECD governments have guidelines on how KBC should be reported.

Skills shortfalls represent a bottleneck: research on the rise of KBC underscores that human capital development must be at the core of policy. Human capital subsumes KBC. For example, over half of all R&D is spent on wages for researchers. Nevertheless, skills shortages in some critical areas are acute: for instance, research in the United States suggests a shortage of some 1.5 million managers able to take advantage of data-related investment opportunities. Insights are here being drawn from the OECD Skills Strategy.

KBC will create new regulatory challenges: for example, in the near future, the Internet will connect things as well as people. A new type of user of mobile networks will emerge - the million-device user (such as car companies whose vehicles connect to the Internet). Today, however, the million-device user can be locked into 10-30 year contracts and charged costly roaming rates. Removing regulatory barriers to entry in this mobile market will yield billions in new services and savings on mobile connectivity.

Aspects of macro-economic policy may need to be recalibrated: recognising that business' spending on KBC is a form of investment has potential implications for macro-economic management. Aggregate savings and the amplitude of business-cycle upturns and downturns may be larger than was previously measured. This insight, which requires further investigation, has barely figured in policy analysis to date.

Better policy can help create economic value from personal data: personal data is now being processed and transferred around the clock and across the globe. The economic value in such data is potentially enormous. Governments must address a range of policy conditions needed to enable the full use of data as an economic asset.

4. Project milestones and outputs

A policy-oriented conference will be held on February 13-14 2013, and a synthesis report will be delivered to the May 2013 OECD Ministerial Council Meeting.