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Task Force on Taxation of the Digital Economy

Report to the Minister for the Economy and Finance, the Minister for Industrial Recovery, the Minister Delegate for the Budget and the Minister Delegate for Small and Medium-Sized Enterprises, Innovation and the Digital Economy

by

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– JANUARY 2013 –

"We're working on a Web service[1] to get rid of tax lawyers, but it's not working yet."

— Jeff BEZOS, CEO of Amazon.com, Inc., 2006[2]

"I am very proud of the structure that we set up.
We did it based on the incentives that the governments offered us to operate."

— Eric SCHMIDT, executive chairman of Google Inc., 2012[3]

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[1] "*A Web service is a software system designed to support interoperable machine-to-machine interaction over a network*" (Wikipedia). A software framework or a Web platform brings together several Web services that external developers can access through application programming interfaces (API). http://fr.wikipedia.org/

[2] Quoted by China MARTENS, "Bezos offers a look at 'hidden Amazon'", *Computer World*, 27 September 2006. http://www.computerworld.com/

[3] Quoted by *La Nouvelle République*, "Le patron de Google "très fier" de son système d'"optimisation" fiscal", 15 December 2012. http://www.lanouvellerepublique.fr/

EXECUTIVE SUMMARY

The digital revolution has taken place. It has given rise to a digital economy that challenges our concept of value creation. The digital economy is actually based on conventional production of goods and services[4]. But, increasingly, start-ups and global companies serving millions of users are changing the rules and bringing radical transformation to all sectors of the economy: through their intense reliance on digital technologies; through their innovative business models; though the abundant financing accessible to them, particularly venture capital; through the continuous improvement in the design of their interfaces and the experiences that they offer through their applications; through the special relationships that they forge with the users of these applications; and through the use that they make of the data derived from the users' activities. Through these companies, the digital economy has come to account for a growing share of the value added in the economies of the largest countries.

The digital economy has become an intimate part of millions of individuals' lives, but its value added is slipping through our grasp. Its organisation, the power of the network effect and the scale of the externalities induced by its business models confound the rules for measuring value added. Yet the number of terminals and connected devices is growing exponentially. The time spent using these devices is showing sustained growth. Entertainment, shopping and production are now taking place in a digital economy that is part of daily life, and even an intimate part of it, for billions of individuals, including consumers, creators, payroll employees and self-employed workers. The digital economy is everywhere, but we are still unable to measure it properly. The fact is that a significant share of its value added has been shifted out of large countries to the accounts of companies set up in tax havens. This shift has a major economic and, more importantly, tax impact. Despite doing a lot of business in the most populous countries, the major digital economy companies pay virtually no tax in those countries.

This means that the productivity gains achieved through the digital economy have not led to increased tax revenues for large countries. There is no historical precedent for this situation.

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The characteristics and dynamics of the digital economy are radically different from those of the thirty post-war boom years:

- The digital economy has led to faster innovation and dissemination of new goods and services. It took three times less time for the majority of French households to be connected to the Internet than it did for the majority of French households to be connected to the landline telephone network. Facebook acquired one billion users in less than eight years.
- Venture capital, which is critical for financing rapid innovation, has provided massive investment in the digital economy. This capital comes with a strong demand for return on investment from the handful of businesses that are successful and attain large-scale growth.
- Dramatic "traction" effects mean that dominant positions are often acquired in the digital economy. In this economy, the competition is not between companies in clearly

[4] Such as software development, IT services, telecommunications, advertising, or content creation.

identified markets, but between whole ecosystems that encompass different related markets.

- The model that the digital economy is built on calls for the bulk of profit to be reinvested, rather than distributed as dividends, and for potential capital gains to provide return for shareholders. In the digital economy, not paying dividends is seen as a sign of intense innovation efforts.
- The digital economy is constantly undergoing rapid change in every sector. This makes it difficult to identify areas of stability, including those that could be used to assess taxes. There is nothing durable about the technologies or business models used, or even the services rendered.
- Finally, the digital economy systematically disconnects the place of business from the place of consumption. Consequently, it is increasingly difficult to fix the location of the value created by this economy and to apply the rules of tax laws that are now outmoded.

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The common feature of all large digital economy corporations is the intense use of data obtained from the regular and systematic monitoring of their users' activities:

- Data, particularly personal data, constitute the key resource of the digital economy. These data enable the companies that collect them to measure and improve the performance of an application, to customise their services, to recommend products to their customers, to support innovation efforts that give rise to other applications and to make strategic decisions. The use of data may also be licenced to third parties under a software platform business model, for example. As a general rule, data constitute the leverage that large digital companies use to scale their business and attain high levels of profitability.
- Data collection reveals the "free labour" phenomenon. Everything leaves a trail in the digital economy. Regular and systematic monitoring of their online activity means that data on application users are collected without any monetary consideration. Users become virtual volunteer workers for the companies providing the services that they use. The data from the users' "free labour" are collected, stored and processed to be integrated into the production chain in real time, blurring the dividing line between production and consumption. Users are attracted by the quality of interfaces and network effects. The data that they provide makes them production auxiliaries and they create value that gives rise to profits on different sides of the business models.

Consequently, the digital economy has stepped outside the theory of the firm: it is possible to "work" the users of an application, in the same way as suppliers and employees were "worked" in the past. The fact that users receive no monetary consideration for their activity explains some of the dramatic productivity gains of the digital economy. The fact that the labour of users in one country contributes to the formation of profits declared in another countries raises an objection on a matter of principle: it is troubling that the companies concerned do not contribute tax revenues to the country where their users live and "work" for them for free. The activity of application users is made possible and even greatly enhanced by public expenditure, particularly expenditure on education, social security and the extension of networks to cover all of the country's territory. The development of the digital economy per se calls for an aggressive industrial policy, which requires additional public expenditure. The major digital economy companies leveraging the activity of web users should contribute their share to this expenditure.

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One common feature of global digital economy companies is the low level of tax on their profits. Even though they are not the only businesses to engage in tax planning, which

is something all multinational groups do, it is easier for digital economy companies to take advantage of tax competition between countries:

- It is easy for them to transfer their profits to tax havens by making payments for intangible assets there. The value of these assets is boosted by returns to scale. Since these profits are not paid out in dividends, they can be saved and reinvested, without being taxed as income.
- Digital economy companies' multi-sided business models mean that thy can extend their business anywhere in the world to "work" their users, but they concentrate their income-generating business in countries where it is easier to transfer profits to tax havens.
- Unlike older companies, which have to undertake restructuring for tax planning, digital economy companies are designed from the outset to make the most of differences between countries' tax systems, particularly when it comes to choosing the location of their head office.

National and international tax law is having trouble keeping up with the effects of the digital revolution. The consequences in terms of direct taxes are very real (corporate income tax, local business tax) as well as the impact on indirect taxes (value added tax):

- International tax law gives the power to tax profits to the country where the company's head office is located, and not the country where the company does business. This principle is the basis for the bilateral model tax treaty established by the OECD for the purpose of preventing double taxation of profits.
- The only exception to this rule is in the case of a permanent establishment in a different country than that of the head office. However, the definition of a permanent establishment, which is based on the presence of premises and personnel, is derived from post-war economic concepts that are not suited to the digital economy.
- The talks about a common consolidated tax base for corporate income tax in order to eliminate tax competition within the European Union have stalled and do not consider the specific features of the digital economy. The same can be said of the discussions led by the OECD up until now, which barely address the digital economy per se;
- There has been a bit more progress on value added tax, where the territoriality rules have been amended to the benefit of consumer countries, despite the difficulty in reaching a unanimous agreement. But this agreement will be phased in between now and 2019 and some of the technical problems still have to be resolved;
- Finally, the earliest attempts to create specific taxation for the digital economy at a strictly national level have failed to hit their target.

A response is urgently needed to break a spiral that is potentially lethal for the economies of the industrialised countries. More than just lost tax revenues are at stake; the growth of the digital economy shrinks the taxable matters located in the industrialised countries through the combined effects of two phenomena:

- First, the dominant business model is that of an intermediary, which means that companies that are not taxed on their income locally capture an increasing share of the profits, thereby reducing the share received by other players in the value chain;
- Second, prices are pushed down by the market power of these intermediaries, which use the data collected from the users of their applications to boost their business.

Urgent action is all the more necessary, since the digital revolution is not limited to a few industries and it is actually "eating" all sectors of the economy. Digital economy companies are going to break into all value chains, starting with travel, banking and telecommunications today, followed by automobiles, urban services and healthcare tomorrow. These companies will focus their efforts on a strategic link in the chain, "working"

their users and capturing a growing share of the profits of local companies subjected to their market power. As the digital revolution spreads through the entire economy, profits from different sectors will be sent offshore, disappearing from the GDP of the large countries and cutting their growth. It will also deprive governments of the added tax revenues potentially derived from the higher productivity of the digital economy. This move has been afoot for ten to fifteen years and it has been picking up speed steadily.

The digital economy will continue to grow. But it will not create new jobs in the large countries unless they have an industrial policy aimed at two complementary objectives: promoting the organic growth of the domestic digital economy and organising the dissemination of the productivity gains achieved to the rest of the economy. Tax policy is one instrument of such an industrial policy. It can be used to promote fair competition between digital economy companies, channel their R&D efforts and generate the tax revenues that the government needs to support this transition.

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The task force formulated three sets of proposals on the basis of this diagnosis.

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1 – Regain the power to tax the profits earned in the country by digital economy companies:

- Corporate income tax is the most appropriate tool ultimately for seeking a contribution that is proportionate to the creation of value inside the country. Net income, or profit, is an aggregate that is specifically intended to measure the net wealth created by a company from its business. Therefore, tax law needs to be reformed so that corporate income tax is assessed on digital economy profits.
- A country cannot achieve this result on its own. Given the specific constraints of international taxation, it is essential to initiate negotiations in the European Community and at the OECD to amend the rules on the division of tax powers. This will call for a definition of a permanent establishment that is specific to the digital economy.
- This definition must be based on the central role played by the data and "free labour" provided by users, which are not yet taken into consideration for tax purposes, even though they are at the heart of value creation, easily attributed to a given country and common to all of the dominant business models of today's digital economy.
- The purpose of these negotiations is to identify a permanent establishment when a company does business in a country using data obtained by regular and systematic monitoring of web users in that country. The share of profit stemming from the use of these data would be subtracted from the transfers made as payment for intangible assets located offshore.

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2 - In the meantime, create a tax on the use of data obtained through regular and systematic monitoring of users' activity in the country.

Collecting data obtained through regular and systematic monitoring of users is the only taxable event that ensures the neutrality of the tax with regard to business models, technologies and business location strategies. Linking tax to the collection and use of data is an approach that is both neutral and sustainable. It is a way of linking the digital economy to a country and it is a strategy, backed by economic and industrial arguments about the value of data, for building up political capital for the coming international negotiations on the division of the power to tax major digital economy corporations.

The task force's proposal does not consist of taxing data collection per se. Instead, the aim is to create a tax incentive for businesses to adopt practices with regard to collecting

and using data obtained through regular and systematic monitoring of web users that are consistent with four public interest objectives:

- Enhancing the protection of individual freedom;
- Promoting innovation in the digital trust market;
- Fostering the emergence of new services for users;
- Generating productivity gains and growth.

The purpose is to apply a principle similar to the "polluter pays" principle that underlies environmental taxes to companies that engage in regular and systematic monitoring of their users' activities. This does not mean that these companies are in any way exempt from the obligations governing fundamental rights relating to the protection of personal data. This "predator pays" principle means that the tax will apply to companies that formally comply with the laws in force and actually engage in a form of exclusive capture of the data collected, by creating de facto obstacles to the portability and personal reuse of the data by the users themselves.

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3 - Create a tax environment that favours the emergence of new companies by reforming the tax treatment of R&D and market financing. More specifically, by

- Adapting the definition of R&D to the characteristics of the digital economy;
- Reforming and simplifying the main measures (research tax credit and young innovative business tax status);
- Providing incentives for the growth of market financing for the digital economy.

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The growth of the digital economy has brought progress, but it has also sorely tested the economies of the large industrialised countries. An industrial policy is needed to support this transition and to ensure that the resulting productivity gains lead to organic growth of new businesses that create domestic jobs. Digital economy companies should contribute their fair share to this effort through taxes. The proposals in this report are aimed at regaining the power to tax the profits earned from the "free labour" of web users: by initiating negotiations on international tax law; by implementing domestic taxation that is both consistent with the economic arguments put forward in these negotiations and favourable for the growth of the digital economy in the country.

CONTENTS

INTRODUCTION[5]

The digital revolution is old news. It has disrupted all sectors of the economy. It has transformed consumption patterns, production relationships, and the dynamics and shapes of both corporations and government agencies. Few institutions have been spared from the challenges it has created. Therefore, it is natural for the digital revolution to lead to changes in taxation. Given the scale of changes in industry, the tax system must be attuned to the way value is now created in our economy.

Industrial revolutions have always led to major tax reforms. *Progressive income tax* was introduced as the industrial economy took off and wage-earning jobs became the norm throughout society. *Value added tax* (VAT) was designed to promote economic growth in the post-war boom years, as value chains grew longer and more complex. The VAT was then adopted by most developed countries and harmonised within the European Union. More recently, France's *general welfare contribution* (GSC) was conceived to replace some of the welfare contributions levied on wages in order to adapt the way social welfare is financed to suit an economy where retirement pensions and capital expenditure income account for a growing share of household revenue.

Of these major tax reforms, the one that had the most impact on corporate taxes was the introduction of VAT. The VAT seemed complex at the time. It raised legal, technical and, of course, political problems. In the preliminary phase, it was tested in certain industrial sectors, before being applied to the economy as a whole, including trade, craft industries and farming. The rules for applying VAT across borders were then defined and adapted when it became necessary to harmonise the tax across the European Union to ensure the smooth operation of the single market.

Since then, the business environment of corporations has been radically transformed, but there have been no major reforms of the taxes applying to them. European construction, the completion of the single market and the introduction of the single currency have had major consequences for corporate strategies with regard to structures and locations within the European Union. The growth of world trade and globalisation of capital markets have also played a role in making it increasingly difficult to tax the profits of multinational groups, giving rise to tax competition strategies between countries.

At the same time, European countries' economies have run up against the "technology frontier"[6]. At this stage of development, the economy has exhausted the productivity gains derived from catching up to the most advanced countries and its growth cannot continue unless economic players boost innovation in both their technology and business models[7].

An economy at the technology frontier is characterised by great instability, stemming from constant renewal of technologies, business models and the contours of the relevant markets. When this economy reaches across national borders, this instability spreads through constantly shifting global markets where industrial transformations take place with increasing frequency, dominant market positions are attained within a few years and weak points suddenly appear and have devastating effects. Venture capital financing, which was

[5] The Task Force would like to thank the following for their support and their advice: Oussama AMMAR, Jean-Marc BENOIT, Melissa BLAUSTEIN, Martin COLLET, Renaud JAUNE, Georges NAHON, Frank-Adrien PAPON, Romain SERMAN, Karine SIBONI, Henri VERDIER and Laetitia VITAUD.

[6] Philippe AGHION, Philippe ASKENAZY, Renaud BOURLES, Gilbert CETTE, Nicolas DROMEL, "Distance à la frontière technologique, rigidités de marché, éducation et croissance," *Economie et statistique*, No. 419-420, 2008.

[7] Scott D. ANTHONY, "The New Corporate Garage", *Harvard Business Review*, September 2012. http://hbr.org/

first conceived and established in the United States by the Frenchman Georges Doriot in the middle of the twentieth century[8], meets the needs of such an economy, where industrial innovation calls for major capital expenditure over a very short period. This expenditure is not provided by large organisations in most cases. In this venture capital economy, recently created companies can grow at a blistering pace and, within a few years, attain larger market capitalisations than other companies, some of which may have been existence for several decades or even several centuries[9].

The principles and application of corporate taxation have not changed enough. Corporate taxation is still based on two main pillars: taxes on profits (corporate income tax) and transaction taxes (value added tax and, in the United States, sales tax). European harmonisation of value added tax and the increasingly dense network of bilateral tax treaties to prevent double taxation of profits have increasingly bound up the taxation of major corporations in a legal framework that it is impossible for any one country to change on its own. Stable tax rules are not a bad thing per se. The strategic objectives of tax policy are to ensure legal stability for taxpayers and to prevent double taxation. But such stability becomes a weakness when it stems more from the inability of governments to reach an agreement than from a desire to provide taxpayers with the security that fosters economic growth. As the pace of economic change speeds up, the rigidity of international and European tax law explains why the principles and references of corporate taxation have remained the same as they were in the nineteen-sixties.

The failure of tax law to keep pace with economic transformation is especially obvious in the case of the digital economy. The mismatch between the characteristics of this economy and the rules governing corporate taxation is more blatant than ever. Correcting this mismatch is now a matter of urgency. The digital revolution has not merely created a new medium or a new distribution channel. It affects or will affect every sector of the economy and it radically challenges two dimensions of tax law: functional analysis of value creation and the rules that determine how taxation powers are divided between countries. Some problems that cropped up very early on were dealt with at the time by new laws, European Directives and new commentaries adopted by consensus at the OECD[10]. But the measures that have been taken, which are several years old in many cases, have one thing in common; they take little account of the lessons learned following the digital revolution or they drew conclusions prematurely, before gauging the full impact of on-going changes.

We were commissioned to draft a report on taxation of the digital economy by Pierre MOSCOVICI, Minister of the Economy and Finance, Arnaud MONTEBOURG, Minister for Industrial Recovery, Jérôme CAHUZAC, Minister Delegate for the Budget, and Fleur PELLERIN, Minister Delegate for Small and Medium-Sized Enterprises, Innovation and the Digital Economy[11].

A preliminary step, before undertaking this task, is to define the digital economy. Digital economy companies are software publishing companies, computer service companies, Web agencies and telecommunications operators. Other companies in sectors such as advertising, information and entertainment have also become primarily digital. More importantly, digital economy companies come in all sizes, from startups to global

[8] Spencer E. ANTE. *Creative Capital: Georges Doriot and the Birth of Venture Capital*, Harvard Business School, 2008.

[9] On 10 August 2011, Apple bested Exxon-Mobil for the first time to post the world's largest market capitalisation, with a value of 331 billion dollars. As of this writing, its market capitalisation stands at more than 480 billion dollars.

[10] The OECD drafted a model tax treaty to help countries that want to sign bilateral treaties to eliminate double taxation. The OECD has appended commentaries to the model, which are updated periodically and designed to explain the meaning and the scope of the treaties. The model and the comments do not set the norm for tax treaties. But, when they date back to the time before the bilateral treaty based on the model was signed, they can indicate the joint intention of the signatories that may be considered by a court.

[11] The letters of commission are appended hereto (Appendix 1), along with the list of people interviewed (Appendix 2) and a bibliography (Appendix 3).

corporations serving hundreds of millions of users. These companies are gradually and radically changing *all sectors of the economy* through their intense reliance on digital technologies, through their innovative business models, though the abundant financing accessible to them, particularly venture capital, through the continuous improvement in the design of their interfaces and the experiences that they offer through their applications, through the special relationships that they forge with the users of these applications and through the use that they make of the data derived from users' activities.

This means that there are many dimensions to taxation of the digital economy: corporate income tax levied on digital economy companies, value added tax on the various activities in this economy, taxation of venture capital, which plays a decisive role in innovation and the growth of digital economy companies, taxation of certain activities that are critical for the digital economy, such as research and development (research tax credit, young innovative company tax status[12]), and special taxes, such as those levied on telecommunications operators.

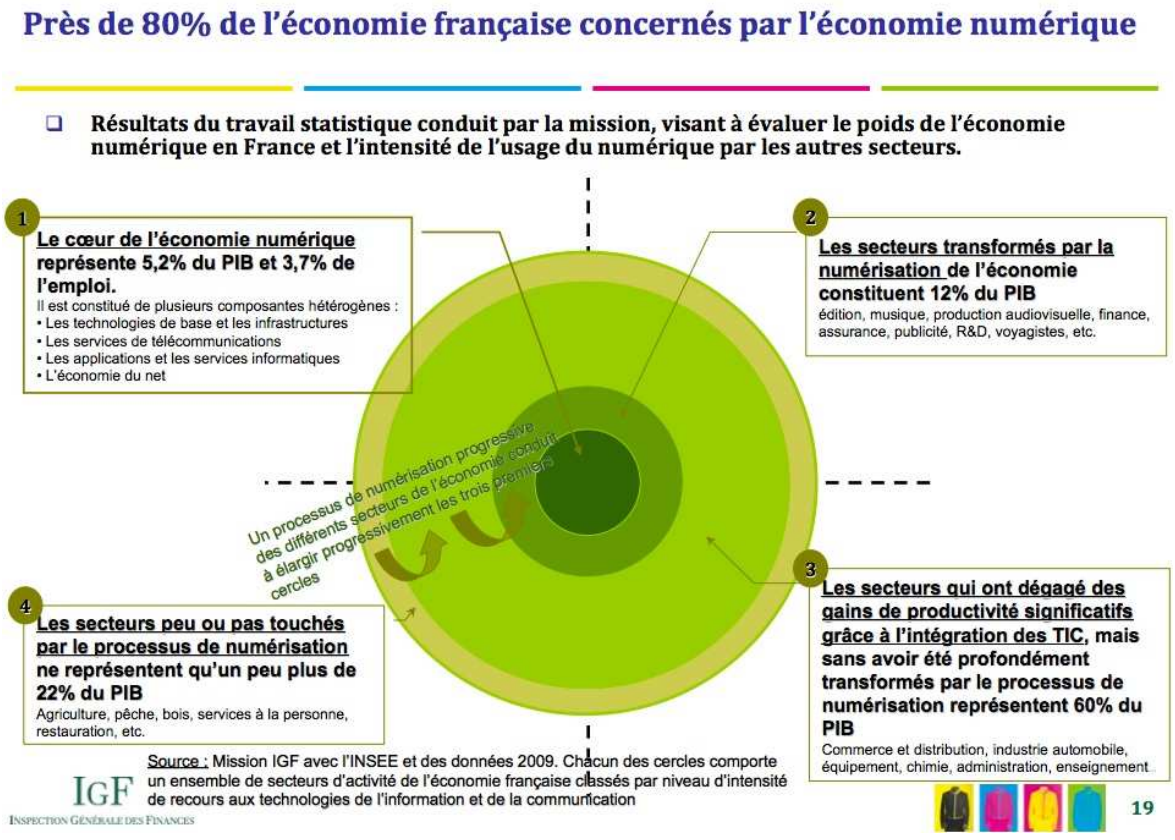
[12] Despite its name, this status has nothing to do with innovation and everything to do with experimental research and development.

1. Growth of the digital economy is driven by large ecosystems that are designed to pay little tax

1.1. The digital economy is dominated by a few large ecosystems

It is no easy task to ascertain the scope of the digital economy. A recent report by France's Inspectorate General of Finances[13] estimated that the share of the economy attributable to the "*core of the digital economy*" at 5.2% of GDP, accounting for 3.7% of the jobs in France. Within this share, three quarters of the value added stems from the provision of digital services (telecommunications, computer applications and services, online services), the remaining quarter is attributable to infrastructure development and production of digital hardware.

The digital economy in France[14]



Nearly 80% of the French economy is affected by the digital economy

Findings of the Task Force's statistical research to evaluate the digital economy in France and the reliance of other sectors on digital technology

1. <u>The core of the digital economy</u> accounts for 5.2% of GDP and 3.7% of jobs.

[13] INSPECTION GENERALE DES FINANCES, Rapport de la *Mission d'évaluation relative au soutien à l'économie numérique et à l'innovation*, No. 2011-M-060-01, January 2012. http://www.igf.finances.gouv.fr/

[14] INSPECTION GENERALE DES FINANCES, *ibid.*

It is made up of several heterogeneous components:

. Basic technology and infrastructure

. Telecommunications services

. Computer applications and services

. The Internet economy

2. **The sectors transformed by digitisation of the economy account for 12% of GDP**

Publishing, music, film and television production, finance, insurance, advertising, R&D, travel services, etc.

Progressive digitisation of various economic sectors leads to gradual expansion of the three inner circles

3. **Sectors deriving substantial productivity gains by incorporating information and communications technologies, but without undergoing radical transformation through digitisation account for 60% of GDP**

Trade and distribution, automotive industry, capital goods, chemicals, administration, education

4. **Sectors where the digitisation process has had little or no impact account for only slightly more than 22% of GDP**

Farming, fishing, forestry, personal services, restaurants and catering, etc.

Source: IGF Task Force with INSEE and 2009 data. Each circle encompasses a set of sectors in the French economy ranked by their reliance on information and communication technology.

This quantification of the digital economy is rigorous, but it is still unsatisfactory for tax purposes for three reasons:

- It fails to capture the full impact of dissemination of digital technology to all sectors of the economy, which is admittedly hard to measure. As whole sectors are disrupted by dissemination of digital technologies, firms undergo transformation or are exposed to competition from new entrants. In both cases, a share of a sector's value added becomes attributable to the digital economy, depending on the intensity of the transformation it causes. This share corresponds to the transformation of production resulting from the digital economy and the development of online applications[15].
- It ignores value created in other countries in multi-sided markets, which are characteristic of the digital economy. Digital services are provided to users located in France free of charge. But these services are often operated from another country, and the value added created on the other side of the market is generally recorded in the accounts of foreign companies and not necessarily captured in national economic statistics. In other words, a substantial share of the value added from the digital economy in France is recorded in the GDP of other countries[16].

[15] Information and communication technologies are actually *general-purpose technologies,* as defined by BRESNAHAN and TRAJTENBERG (1994, 1995): and like electricity or railroads, they spread through the broader economy and lead to many further developments.

[16] Not to mention the methodological problems of measuring value added generated by the rising trend of the consumer surplus. On this subject, see Erik BRYNJOLFSSON, "Why it Matters that the GDP Ignores Free Goods," 12 November 2012. http://techonomy.com/

- Economic statistics do not do a good job of capturing the central components of value creation in the digital economy: challenges for the evaluation of the digital economy include free online applications, the importance of data in value creation[17], the dominance of the free software model, the minute cost of copying data and business models that promote access rather than ownership. Generally speaking, there is a considerable disconnect between the share of the digital economy shown in the statistics and the importance that it now has in the daily lives of tens of millions of French citizens.

This means that it is important for the digital economy to be defined by its own specific development dynamics as well. It is an economy that is driven by constant change and it is present in many aspects of our day-to-day lives. Software publishing firms, computer services and engineering firms, and telecommunications operators have not raised any challenges to the relevance of tax laws. On the other hand, tax laws have the greatest difficulty capturing digital economy firms. These firms' innovative business models and their strong and rapid growth, along with exponential returns to scale, have given them a dominant and consolidated global position within an innovation ecosystem.

1.1.1. The digital economy is characterised by intense innovation efforts and systematic pursuit of strong and rapid growth

Market positions in the digital economy are precarious because of the pace of innovation in technology and business models. Google, with its innovative approach to indexing the Internet, overtook an entire generation of search engines, including Yahoo!. Myspace was the first large-scale social networking application, but it was overcome by the rise of Facebook. Amazon, which now dominates the online retail sales market, had to invest in powerful software infrastructure over many years and change its business model several times in order to beat its competitors. And, Apple, especially, was on the brink of bankruptcy in 1997, when Steve JOBS, one of the founders, took over the reins again and brought radical transformation to many sectors of the economy, including the music industry[18].

There are no longer permanent models in the digital economy on which to build enduring production methods, distribution networks and specification channels. In other words, the digital economy is characterised by intense innovation:

- Technological progress is one of the factors behind this intensity. Moore's[19] famous law stipulates that the number of transistors on integrated circuits doubles every two years[20]. This empirical rule still holds true and explains the progress in miniaturisation and the downward trend in the cost of computing power. At the same time, innovation in the telecommunications sector and considerable capital expenditure by operators explain the multiplier effect of innovation in the digital economy.
- The Internet and its economic model are another innovation factor[21]. It fosters experimentation, continuous improvement in application designs and the development of innovative business models. It has given rise to new services that disrupt the conventional conception of value chains. The fact that neither the end user nor the service provider are required to pay a marginal price for using the network, regardless

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[17] Michael MANDEL, "Beyond Goods and Services: The (Unmeasured) Rise of the Data-Driven Economy," *Progressive Policy Institute Policy Memo*, October 2012. http://www.progressivepolicy.org/

[18] Walter ISAACSON, Steve Jobs, Simon & Schuster, 2011. French translation: Walter ISAACSON, Steve Jobs, JCLattès, 2011.

[19] Named after Gordon E. MOORE, one of the founders of Intel.

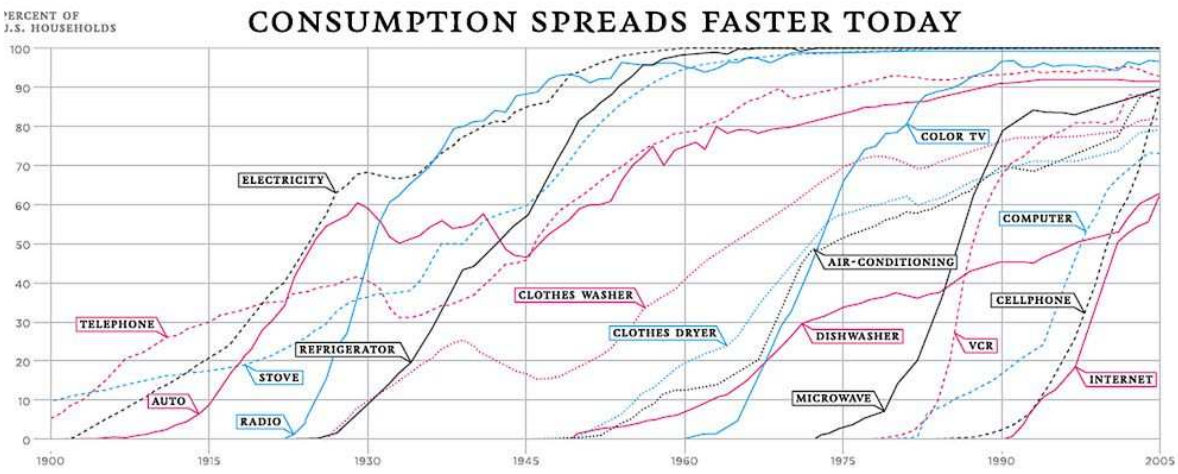
[20] http://fr.wikipedia.org/

[21] Brad TEMPLETON, "On the Invention of the Internet," 4 May 2005. http://ideas.4brad.com/

of the nature of the service or the bandwidth required[22], has led to the dramatic growth of the digital economy.

The pace at which new digital economy goods and services are adopted testifies to the increasing speed of its growth. As the figure below[23] shows, it took nearly 50 years to put a telephone into the majority of American homes and, before that, it took twenty years to connect the majority of homes to the electricity grid. More recently, the majority of households adopted the Internet and mobile telephones in less than 15 years.

The speed of adoption of consumer goods and services (United States)[24]



Under the circumstances, major on-line applications grow increasingly quickly. Facebook went on-line in 2004 and had more than 200 million users by 2009. It then reached 800 million users in 2011 and *one billion* users in 2012. To date, French residents have opened and used more than 20 million Facebook accounts. More recently, comScore collected data that show Pinterest was drawing 10 million unique visitors per month after one year, which made it the stand-alone service with the fastest "traction" in the whole history of the Internet[25].

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[22] This fundamental rule of the Internet economy does not prevent some service providers from buying more bandwidth from telecommunications operators under interconnection agreements in order to improve their service to end users. But the related payment under the terms of an interconnection agreement does not constitute a barrier to entry to operating an Internet service. It becomes an expense only when the service reaches such a scale that, given the nature of the service and the number of users, more resources have to be allocated to providing the service over interconnected networks.

[23] The diagram dates back to 2008 and was taken from the *New York Times* Website. http://www.nytimes.com/

[24] Copyright 2008 The New York Times Company. http://www.nytimes.com/

[25] Only visits in the United States are measured for the period between February 2011, when the service went live in its current form, and January 2012. See Josh CONSTINE, "Pinterest Hits 10 Million U.S. Monthly Uniques Faster Than Any Standalone Site Ever – comScore," *Techcrunch*, 7 February 2012. http://techcrunch.com/

Pinterest, the fastest "traction" in history[26]

This spectacular "traction", which all major digital economy firms have enjoyed, has become a defining criterion of the digital economy. As Paul GRAHAM, founder of the business accelerator, Y Combinator, once wrote, a start-up can be distinguished from a small or medium-sized innovative enterprise by the fact that it is designed from the outset to attain strong and rapid growth[27], in keeping with the ambitions of the entrepreneurs behind them, who are often driven by a desire to change the world[28], or at least to transform an entire sector of the economy. The aim for "scalability" from the outset, which enables digital economy firms to attain very large scales through exponential productivity growth is one of the key characteristics to be considered in order to understand the digital economy and its dynamics[29].

1.1.2. The digital economy receives massive venture capital financing

The digital economy is characterised by its close links to venture capital. The large scale attained by recently created companies stems in part from the massive allocation of financial resources to research and development, building appropriate hardware and software infrastructure, iterative interface design and user experience improvements, marketing and communication.

- Large mature firms have great difficulty in successfully completing projects involving game-changing innovation, especially because of the threats that such projects can pose

[26] John CONSTINE, "Pinterest Hits 10 Million U.S. Monthly Uniques Faster Than Any Standalone Site Ever – comScore," *Techcrunch*, 7 February 2012. http://techcrunch.com/

[27] "A startup is a company designed to grow fast. Being newly founded does not in itself make a company a startup. Nor is it necessary for a startup to work on technology, or take venture funding, or have some sort of "exit." The only essential thing is growth. Everything else we associate with startups follows from growth." Paul GRAHAM, "Startup = Growth", September 2012. http://paulgraham.com/

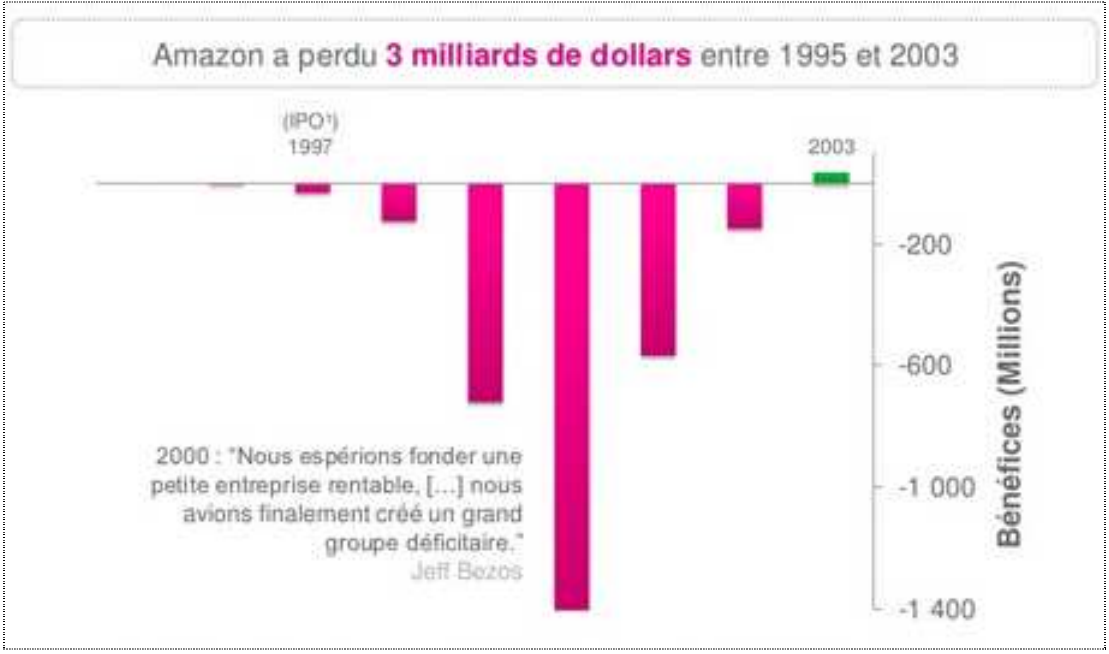
[28] In the famous words that Steve JOBS spoke to John SCULLEY in 1983 to convince the latter to leave PepsiCo and become the head of Apple Computer.

[29] Georges NAHON, "Comment l'État peut favoriser l'essor des *startups* de technologie," *Le Monde*, 7 January 2013. http://www.lemonde.fr/

for their market positions and profit margins[30]. The purpose of strategy consulting is to overcome this flaw in major groups[31]. Venture capital gets around this flaw by facilitating startups with the objective of competing with big firms or being bought out by them. Venture capital makes up for the small size of startups by letting them raise the substantial funding needed for disruptive innovation in a very short space of time[32]. With very few exceptions, all of the big digital economy firms now in existence were recent startups where resources were managed by venture capitalists;

- The raising of substantial quantities of capital in the second half of the nineteen-nineties led to the bursting of the tech bubble in 2000. Even though they ultimately harmed the overall economy, those years of abundant capital enabled a few players to attain dominant positions that they have steadily consolidated since then. Between 1995 and 2003, Amazon burned through nearly *three billion dollars*, primarily financed by its own equity, before turning a profit (see figure below). Google started doing business in 1998 and then took advantage of the bursting of the tech bubble and the slump in capital expenditure to attain a dominant position on the on-line search market more rapidly. The success of the first generation of digital economy firms made the entrepreneurs behind them very wealthy. They then became investors in their own turn and their informed choices led venture capital funds to a new generation of digital economy champions, with Facebook being the most emblematic today[33].

Amazon's capital expenditure in the nineteen-nineties[34]



[30] Clayton CHRISTENSEN, *The Innovator's Dilemma*. Harvard Business School Press, 1997. Scott D. ANTHONY, "The New Corporate Garage," *Harvard Business Review*, September 2012. http://hbr.org/

[31] Walter KIECHEL III, *The Lords of Strategy*, *The Secret Intellectual History of the New Corporate World*, Harvard Business Press, 2010. Christopher D. MCKENNA, *The World's Newest Profession*, Cambridge University Press, 2006.

[32] In the eight years between the creation of Facebook and its IPO, the company raised a total of one and a half billion dollars from equity investors. *Cf.* DEALBOOK, "Tracking Facebook Valuation," *The New York Times*, 1 February 2012. http://dealbook.nytimes.com/

[33] With the investments of Peter THIEL, the PayPal founder, and Marc ANDREESSEN, the Netscape founder, in Facebook.

[34] FABERNOVEL, "Amazon.com, l'Empire caché," 2011. http://www.slideshare.net/ Data source: Amazon.com. IPO.

- In 2010, American venture capital funds invested some 22 billion dollars in 2,749 companies, including 1,001 that were seeking venture capital for the first time[35]. A 2011 survey shows that venture-capital-funded startups in the United States accounted for 11.87 million jobs in 2010, which represents 11% of the private sector labour force, and more than 3,000 billion dollars in value added, which represents 21% of American GDP[36]. Furthermore, it was shown that on an average of every three months since 1998, the United States gave birth to a digital economy firm that was initially financed with venture capital and later valued at more than one billion dollars[37]. The recent billion-dollar companies include most of the ones that currently dominate the global digital economy markets and are transforming many sectors of the economy[38].

All in all, venture capital is the financing instrument that best suits the characteristics of digital economy companies. It can even be used to refine the definition of such companies. The business model of a venture capital fund calls for investing in many projects with a small chance of success but very high potential returns. This means that the success of a single project can make the fund's internal rate of return positive, even if many of its other investments are failures. This is why venture capital funds seek companies with the potential for rapid growth and very high returns to scale. Naturally, venture capital is not used solely to finance the digital economy. It cannot be confused with the digital economy per se. But venture capitalist focus primarily on the digital economy, because that is where innovation is concentrated and because of the scale of the transformations that it brings about in all sectors of the economy, giving it the greatest potential for high returns.

Venture capital has now become an instrument of the United States' sovereignty and economic growth. It is the financing that, outside large organisations, makes it possible to launch startups designed for strong and rapid growth from the outset[39]. Through intensive use of digital technologies, innovative business models and suitable strategies, these companies can be doing business on a global scale in the space of a few years. This scale enables them to capture a growing share of the value added in entire sectors of our economy, while using the existing tax rules to minimise the taxes they pay to the governments of the countries where the users of their applications are located.

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35 NATIONAL VENTURE CAPITAL ASSOCIATION and IHS GLOBAL INSIGHT, *Venture Impact*, 6th edition, 2011. http://www.nvca.org/. For a contrasting view of the situation in Europe, see Roger KELLY, "The Performance and Prospects of European Venture Capital," European Capital expenditure Fund, September 2011. http://www.eif.org/

36 NATIONAL VENTURE CAPITAL ASSOCIATION and IHS GLOBAL INSIGHT, *ibid.*

37 Lo Min MING, "A billion dollar software tech company is founded every 3 months in U.S.," 12 November 2012. http://blog.minming.net/

38 In particular, Google (search engine, founded in 1998), PayPal (online payments, 1998), Salesforce (business software platform, 1999), Pandora (interactive radio, 2000), TripAdvisor (travel advice, 2000), LinkedIn (professional network management, 2002), Skype (Internet telephony, 2003), Palantir (database integration and decision-making aid, 2004), Kayak (airline reservations, 2004), Facebook (social network management, 2004), Evernote (note-taking and indexing, 2004), YouTube (video sharing, 2005), Twitter (microblogging, 2006), Tumblr (blog hosting, 2007), Dropbox (file hosting and synchronisation between devices, 2007), Zynga (social games, 2007), Github (computer development tools, 2008), Airbnb (private accommodation arrangements, 2008), Groupon (group purchases, 2008), Pinterest (image-based social interactions, 2008), Square (electronic payments, 2009), Quora (question and answer database, 2009), Fab (design publishing and sales, 2010) and Instagram (photo sharing, 2010). Three of the American digital economy giants are not on this list because they were founded before 1998: Microsoft (founded in 1975), Apple (founded in 1976, then relaunched in 1997) and Amazon (founded in 1994). Hulu (television over the Internet, 2007) is the exception, since it was not financed by venture capital. It is a joint venture owned by several major American broadcasters (NBCUniversal Television Group (32%), Fox Broadcasting Company (31%), Disney-ABC Television Group (27%). The investment fund, Providence Equity Partners owns the remaining 10%.

39 Georges NAHON, "Comment l'État peut favoriser l'essor des *startups* de technologie," *Le Monde*, 7 January 2013. http://www.lemonde.fr/

1.1.3. The digital economy is constantly shifting

The technological unity made possible by the combination of information and communication technologies[40] explains the range of digital economy firms' business activities. Far from being restricted to a single market, these firms use their innovation efforts to achieve constant change in their business. The only constant is their strategic objective, which is to be their users' first choice for access to digital economy goods and services. To achieve this, they have to develop an entire ecosystem of applications, operated by themselves or by third parties, in order to become the point of access of choice.

1.1.3.1. The strategic objective of developing close relationships with users

Each of the four leading digital economy firms has shown in its own way that its priority is to have a special relationship with its users:

- Apple maintains strict control over the user experience for the devices that it manufactures and sells, either by producing the operating system and the most important applications itself, or by requiring application developers to comply with very severe terms of use[41]. It is not for nothing that Apple was a trailblazer in the development of smartphones, since this new device allowed to enter its customers' existence and even their private lives on an unprecedented scale[42].
- Amazon has long presented itself as "*the Earth's biggest bookstore"*[43]. By expanding its catalogue to other products beside books, it then endeavoured to become the Earth's biggest store. At the same time, it opened up to outside sellers to become the Earth's biggest marketplace, "*the one place where you buy everything"*[44]. This enables it to forge a special relationship with its customers, which is has been further strengthened by the launch of the Kindle device[45].
- Google's self-proclaimed mission is to "*organise the world's information and make it universally accessible and useful*"[46]. It has patiently designed and improved a search engine user experience that is entirely built around access to information: Google now organises Webpages, images, videos, books, news media, maps, personal publications, tourist destinations and even private correspondence for its users.

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[40] Digital technology consists of making all information uniform, comparable and fungible by using the 0 and 1 coding.

[41] Brian X. CHEN, "Apple's Secret iPhone Developer Agreement Goes Public," *Wired*, 3 September 2010. http://www.wired.com/

[42] Several years before the iPhone was invented, Steve JOBS told *Fortune*, "*We're still heavily into the box. We love the box. We have amazing computers today, and amazing hardware in the pipeline. I still spend a lot of my time working on new computers, and it will always be a primal thing for Apple. But the user experience is what we care about most, and we're expanding that experience beyond the box by making better use of the Internet. The user experience now entails four things: the hardware, the operating system, the applications, and the Net. We want to do all four uniquely well for our customers.*" Steve JOBS, "Apple's One-Dollar-a-Year Man," *Fortune*, 24 January 2000. http://money.cnn.com/magazines/fortune/

[43] It was even sued for this by the booksellers Barnes & Noble. See "Amazon.Com Sued For `Earth's Biggest' Claim," *The Seattle Times*, 13 May 1997. http://www.seattletimes.com/

[44] Alexei ORESKOVIC and Alistair BARR, "Amazon, Google on collision course in 2013," *Reuters*, 23 December 2012. http://www.reuters.com/

[45] Steven LEVY, "Jeff Bezos Owns the Web in More Ways Than You Think," *Wired*, 13 November 2011. http://www.wired.com/

[46] http://www.google.fr/about/company/

- Facebook styles itself as a company with a social objective: *"to make the world more open and connected"*[47]. Buy attracting more than one billion individual users, who sometimes spend several hours each day on its application[48], Facebook has managed to become a central part of its users' daily lives. It provides them with relevant access to digital economy goods and services through their network of friends.

The fact that these four companies have the same strategic objective means that they are competing with each other on several markets, either directly through their strategy of becoming users' preferred point of entry into the digital economy, or through their tactical moves on the underlying or related markets as part of a long-term strategy. These companies are competing with each other in such activities as the organisation of information, smartphone operating systems, devices, advertising, access to content, browsers, software resources and application stores[49].

1.1.3.2. Hybrid activities and business models

Of course there is specialisation in the digital economy. Concentrating on an application that provides a specific service in a specific area is even a documented criterion for the success of a startup[50]. But digital economy business models confound classifications at two points: first, in the startup phase, where innovative potential is boosted by efforts to achieve differentiation and systematic seeking of a hybrid model (the famous "disruption"[51]); then in the growth phase, once the brand has been established, the technical infrastructure has become robust and it has become necessary to take up positions on related markets in order to maintain a competitive advantage. It is no easy task to ascertain where a digital economy company is in its cycle on a clearly identified market, or how it connects to a pre-existing activity sector or even to a well-documented business model. Differentiation, hybridisation, contrarianism and the "pivot" are some of the decisive factors for the success of a digital economy application. Since digital technology unifies rather than separates, it blurs the dividing lines between various notions that do not stand up to close scrutiny.

One example of this blurring is the dividing line between online searching and answering questions. Online searching is seen as one market. Google is reputed to hold the dominant position on this market. However, the different ways of making online searches are more diverse, since looking for information has increasingly become a case of a user asking a question and wanting the most authoritative answer possible:

- Quora has become a very successful application that organises information to be available as answers to users' questions. The questions and answers are submitted by

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47 FACEBOOK INC., "Letter from Mark Zuckerberg," *Form S-1 Registration Statement Under The Securities Act of 1933*, 1er February 2012. http://www.sec.gov/

48 As Michel SERRES recently said, "*People like me, who were born before computers, we work WITH them. We are outside of the computer. On the other hand, Little Miss lives IN the computer. For her, the computer is not a tool. It is part of her living conditions. She is on Facebook and social networks, and her telephone is plugged into her…"* Laurent VALDIGUIE, "Serres : "Ce n'est pas une crise, c'est un changement de monde"," *Le Journal du dimanche*, 30 December 2012. http://www.lejdd.fr/

49 "Another game of thrones, Google, Apple, Facebook and Amazon are at each other's throats in all sorts of ways," *The Economist*, 1er December 2012. http://www.economist.com/

50 Geoffrey A. MOORE, *Crossing the Chasm: Marketing and Selling Disruptive Products to Mainstream Customers*, Harper Business Essentials, 1999. Steve BLANK and Bob DORF, *The Startup Owner's Manual*, K&S Ranch, Inc. 2012. 37SIGNALS, *Getting Real*: *The smarter, faster, easier way to build a successful web application*, 2006. http://gettingreal.37signals.com/

51 *Disruption* is a strategic objective of most digital economy firms. It consists of transforming or even creating a market by changing the rules of the game in whole sectors of the economy.

users, along the lines of the discussions between developers on Github[52], that are then selected and ranked by relevance. Today, Quora's strategic objective seems to be to compete with Wikipedia, or even Google, in providing access to on-line information[53].

- Apple's voice recognition interface, Siri, which has been available since the iPhone 4S, is a new way of making on-line searches. Siri was originally intended for practical searches. It uses learning algorithms that could improve Siri's performances even further, since the ways of using the application are diversifying with the potential opening of the underlying software platform, which means that Siri could one day be seen as the most dangerous competitor for Google's search engine[54].
- In their own way, Facebook and Twitter have become search engines: they can be used to search past conversations or to ask questions to friends or followers. Generally speaking, the ultimate purpose of these applications has become to mobilise a whole network of individuals to find the best answer to a specific question[55]. Facebook has just equipped its application with a search engine that focuses on activities and interests within networks of friends[56].
- Google's strategy proves that there is no longer only one accepted meaning of the notion of a search engine. Google bases its comparative advantage on a search method: it consists of entering key words to obtain a display of "*a million blue links*"[57]. The fact that there are a finite number of key words explains the success of the PageRank algorithm and the AdWords advertising platform connected to it. But the proliferation of Web content makes indexing it an increasing complex task, leading Google to transform and diversify its services.
  - Regular changes to its algorithm improve the relevance of the search results and prevent redundant results[58].
  - Google offers specialised searches by topic (Google Shopping, Hotel Finder) or by format (YouTube), which puts it in direct competition with the rest of the Web: the search engine no longer merely points users towards the most relevant content; increasingly, it tries to formulate the answer to the question on its own[59].

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52 Quentin HARDY, "Github Has Big Dreams For Open Source Software, and More," *The New York Times Bits*, 28 December 2012. http://bits.blogs.nytimes.com/

53 Mathew INGRAM, "Quora wants to go head-to-head with Wikipedia — and maybe Google too," *GigaOM*, 21 December 2012. http://gigaom.com/

54 Rip EMPSON, "Gary Morgenthaler Explains Exactly How Siri Will Eat Google's Lunch," *Techcrunch*, 9 November 2011. http://www.techcrunch.com/

55 Paul KEDROSKY, "Curation is the New Search is the New Curation," 11 January 2011. http://paul.kedrosky.com/

56 Harry MCCRACKEN, "Facebook's Graph Search Is the Future of Facebook," *Tech Time*, 15 January 2013. http://techland.time.com/

57 Rip EMPSON, *ibid.*

58 The latest major change, called "Panda", had a drastic effect on the relative visibility of different content that jeopardised certain business models. See Olivier SICHEL, "Google a une vision hégémonique et caricaturale de l'internet européen," *Le Monde*, 24 May 2011. http://www.lemonde.fr/

59 Google's alleged bias in favour of its own services in the display of search results has led to complaints to the competition authorities in both Europe and the United States. The ruling of the European Commission's Directorate-General of Competition has not yet been announced as of this writing. See Marie-Catherine Beuth, "Google soupçonné de manipuler ses services," *Le Figaro*, 4 January 2011. http://www.lefigaro.fr/. In the United States, the Federal Trade Commission recently ended its investigation and accepted a compromise with Google in return for certain concessions. See Tim WU, "Why Does Everyone Think Google Beat the FTC?," *The New Republic*, 5 January 2013. http://www.tnr.com/

- Google has taken up a position on the social search market[60], as shown by the launch of Google+, which provides a forum for interactions between users and expands the indexed content to include individual contributions, which, indirectly, makes it possible to improve the relevance of the PageRank algorithm[61].
- Google presents users with suggestions of how to word their requests so that the question asked is one that Google already knows and obtains an answer that has already proved satisfactory in the past[62].
- Google has gradually turned its search engine into an "*answer engine,*" with the recent introduction of the Knowledge Graph algorithm[63].

In view of the diversification of online search models, it is no easy matter to come up with a single definition of this activity. It does not correspond to a technology, or a functional area, or a sector or even a clearly identified market. Google itself, through the growing diversification and sophistication of its business model, has shown that online searches are more of a pretext for forging closer and stronger relationships with users rather than a clearly identified economic activity.

A second example is the blurring of the dividing lines between pay-per-performance advertising and consumer services. There is nothing new about pay-per-performance advertising. For more than a century, direct marketing, "*a communication and sales technique that consists of sending personalised inducements to a target audience of individuals or businesses with the aim of obtaining an immediate and measurable response*"[64], has been familiar with measuring the efficiency and effectiveness of advertising, earning the admiration of such great professionals as David OGILVY[65].

But the digital economy in general, and Google in particular, have substantially improved advertising performance measurement, by spreading its use to all formats and all media. Online, everything can be tracked, provided the users can be identified or accept measurement tools, such as cookies. Under these conditions, it is easy to determine how many times a link has been followed or how many times a banner has been displayed. It is also possible to tell the advertiser about the circumstances under which the Web user saw the banner or followed the link (based on the record of the user's navigation and the page content). In some cases, certain social and demographic data that are helpful for sales can be learned or inferred, such as the user's age, postal code, interests or marital status. Performance measurement, combined with knowledge about users, has disrupted the advertising market[66]. It has opened the way for an area of potentially infinite innovation: *personalised* and *targeted* advertising to boost performances.

Sophisticated advertising techniques have a major consequence: advertising becomes increasingly difficult to distinguish from a *service* in a context where the users' attention is hard to capture and maintain and the purpose of the advertising is to present the right information to the right person at the right time. A company such as Fab, where the core

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60 This ambition was first revealed in 2009, by the acquisition of AardVark. Google used AardVark's social search engine for a while and then closed it down. See Jason KINCAID, "Aardvark Publishes A Research Paper Offering Unprecedented Insights Into Social Search," *Techcrunch*, 2 February 2010. http://techcrunch.com/

61 Amir EFRATI, "There's No Avoiding Google+," *The Wall Street Journal*, 2 January 2013. http://online.wsj.com/

62 Frédéric KAPLAN, "La question de la langue à l'époque de Google," Ecole polytechnique fédérale de Lausanne, December 2012. http://fr.slideshare.net/

63 Amit SINGHAL (*Senior Vice-President* Google Inc.), "Lancement en France du Knowledge Graph : des mots aux entités," *Official Blog of Google France*, 5 December 2012. http://googlefrance.blogspot.fr/

64 http://fr.wikipedia.org/

65 David OGILVY, *Confessions of an Advertising Man*, Southbank Publishing, 2011.

66 Ken AULETTA, *Googled, The End of the World as we Know It*, The Penguin Press, 2010.

business is to present editorial content about designers' work, shows the blurring of the lines between the editorial content and online sales[67], which has been enshrined in an emerging discipline known as *content marketing*[68]. In the case of Amazon the retailer is merely diversifying its recommendation services by becoming an advertising medium[69], thereby embracing the technique of advertising featured products or "gondola-end displays". The affinity model reveals the blurring of the lines between advertising and services: price comparison engines, specialised blogs and social networking applications are increasingly receiving a cut of the sales resulting from the traffic that they forward to merchandising applications.

The market is moving increasingly to paying intermediaries for sales generated, instead of paying media for displaying advertising. The notion of recommendation services is gaining ground on the notion of advertising[70]. This shift has been facilitated by real-time ad exchanges, which enable companies to find advertisements that are helpful for the users of their applications[71].

1.1.4. The digital economy is dominated by large ecosystems

The competition between the leading digital economy firms is characteristic of competition at the technology frontier, since it is based on service differentiation and innovation. Efforts to expand their businesses focus less on head-to-head competition. Their efforts involve trying by every means possible to leverage the dynamics of their ecosystems. This means that there are few cases where one company takes on another by offering a comparable product. Microsoft's Bing search engine is a rare example of an attempt to attack Google's dominant position on the horizontal search market. Microsoft's Azure software platform is a direct response to the rise of Amazon's AWS software platform. Google+, Google's attempt to take a position on the social networking market, has failed to convince industry observers[72]. The current convergence of strategies in certain markets with strong growth potential[73] or the refusal to make competing companies' applications interoperable[74] are transient signs of keen competition between the firms that John DOERR, the manager of the Kleiner Perkins fund has called "the four great horsemen of the Internet"[75].

Generally speaking, the digital economy fosters concentration, as Tim WU[76] has shown. When a company has enough traction in an immature market, the network effects and the

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[67] Sarah LACY, "Fab Isn't an E-commerce Company; It's a Content Company with Sales," *Pando Daily*, 8 February 2012. http://pandodaily.com/

[68] Shafqat ISLAM, "10 Ways Brands Will Win With Content Marketing in 2013," *Mashable*, 22 December 2012. http://mashable.com/

[69] Ryan TATE, "Amazon Proves It Is Hard-Core About Advertising," *Wired*, 17 December 2012. http://www.wired.com/

[70] Darrell HETHERINGTON, "Apple Taps Amazon Search Exec To Helm Siri, Signals A Move To A Smarter Personal Shopping Assistant," *Techcrunch*, 15 October 2012. http://techcrunch.com/

[71] Eric SAVITZ, "Facebook Exchange And The Rise Of Real-Time Ad Bidding," *Forbes*, 14 June 2012. http://www.forbes.com/

[72] Alexis C. MADRIGAL, "How Google Can Beat Facebook Without Google+," *The Atlantic*, 24 May 2012. http://www.theatlantic.com/

[73] Jessica E. VASCELLARO and Yukari Iwatani KANE, "Schmidt Resigns His Seat on Apple's Board," *The Wall Street Journal*, 4 August 2009. http://online.wsj.com/

[74] Jason KINCAID, "Google To Facebook: You Can't Import Our User Data Without Reciprocity," *Techcrunch*, 4 November 2010. http://techcrunch.com/

[75] Andrew NUSCA, "Kleiner Perkins' Doerr: Google, Facebook, Amazon, Apple the 'four great horsemen of the Internet'," *ZDNet*, 24 May 2010. http://www.zdnet.com/

[76] Tim WU, *The Master Switch: The Rise and Fall of Information Empires*, Vintage Books, 2010. http://timwu.org/

lack of friction stemming from the especially intangible nature of its business enable it to achieve a dominant position in a very short time[77], even attaining global scale and giving rise to an ecosystem. Competition policy is especially hard to implement in the digital economy.

- It is hard to identify the relevant markets. A relevant market is one where supply and demand come together for goods and services that consumers consider to be substitutes for each other. However, it is difficult to imagine that products are substitutable when growth dynamics are based on functional differentiation efforts or creating hybrid services, which are the characteristics of an economy at the technology frontier that is revealing new needs.
- Multi-sided business models make enforcement of competition laws more complicated. The firms with dominant positions in the digital economy are often those with multi-sided business models, which are also the firms that leverage the externalities from their users' activity the most. But these externalities cannot always be identified, much less quantified.
- The digital economy tends to maximise the consumer surplus by providing free services in most cases or by causing such intense competition between suppliers that they have to lower their prices for end consumers. The ultimate purpose of competition law is to protect consumers. This makes it difficult to use it against companies that maximise the consumer surplus by refusing to apply high profit margins or by earning their revenue on another side of their business model[78].
- Taxation, which is an integral part of competition conditions, must not strengthen dominant positions. The companies with dominant positions are the ones most able to find ways to minimise their effective tax rate or to apply the lowest VAT rates to the online services that they provide. Furthermore, competition authorities do not consider differences in tax systems when assessing whether competition is fair or not.

1.2. Favourable conditions from the outset enable major American digital economy firms to pay very little corporate income tax

All multinational groups optimise their declared income in the various countries where they do business in order to minimise their effective tax rate. There are different reasons for this practice: financial communication, seeking returns to scale that are characteristic of a large group, developing a global scale and, in some cases, simply the proactivity and ingenuity of business services companies that offer their clients increasingly sophisticated tax planning strategies.

Multinational groups rely on several types of instruments to diminish their effective tax rate:

[77] The main digital economy markets reveal this concentration. In purely intangible businesses, Google dominates the search market, particularly searches by key works, whereas Facebook leads the peer-to-pear interactions market (with Twitter, LinkedIn and Pinterest playing minor roles). In hybrid markets, where the physical components and reliance on intermediaries in regulated markets lend themselves less well to concentration, Google and Apple dominate the market for smartphone operating systems, whereas Apple and Amazon dominate the market for cultural and entertainment goods. Intermediation markets are also concentrated, with, for example, the dominance of the tourism market in France by Booking.com and Expedia, which does business through a joint subsidiary with the French railways (SNCF).

[78] If we consider the users' contribution to producing the service, it is obvious that we can stop thinking of them as end consumers, which undermines the reasoning followed by competition law in certain multi-sided markets.

- Reclassifying certain activities in the value chain in order to reduce profits and ensure that there is no permanent establishment: a subsidiary acting as a distributor may become an agent linked to a group by a commissionaire contract, thereby reducing sales revenues to nothing more than the agent's commission and minimising the entrepreneurial risk-taking related to its activity. In this case, the sales revenue may be only slightly greater than expenses and, since a commissionaire arrangement does not constitute a permanent establishment, the government is deprived of its power to tax the parent company[79].
- Location strategies favouring certain countries to take advantage of statutory tax benefits and tax treaties. Domestic tax rules may favour holdings, intellectual property rights or R&D. Asymmetrical tax laws regarding loan interest deductions can result in "double non-taxation" of some profits. Some "conduit countries" do not levy withholding taxes on profits transferred to tax havens.
- Centralising intellectual property in countries where taxes on profits are lower. In a functional analysis of a multinational group, intellectual property is the main "entrepreneurial risk-taking" function. The tax administration deems that routine functions are the ones that can report stable and minimal profits that are proportionate to sales revenue. The entrepreneurial risk-taking functions account for the remaining profit, which is more volatile, but potentially greater as well. This profit is centralised in the countries where the taxes on profits are the lowest.
- Optimising transfer prices[80] charged by the different entities in the group. Transfer prices apply to transactions between companies within the group. Such transactions can be used to shift profits, by overcharging or undercharging in relation to market prices. The tax administration monitors these prices on the basis of the "arm's length" principle enshrined in the OECD Model Tax Convention. Groups can obtain substantial reductions in their overall tax rate by making even minor changes to these prices.

In the digital economy, tax planning is even easier to implement because of the companies' financial strategies and the characteristics of their business models.

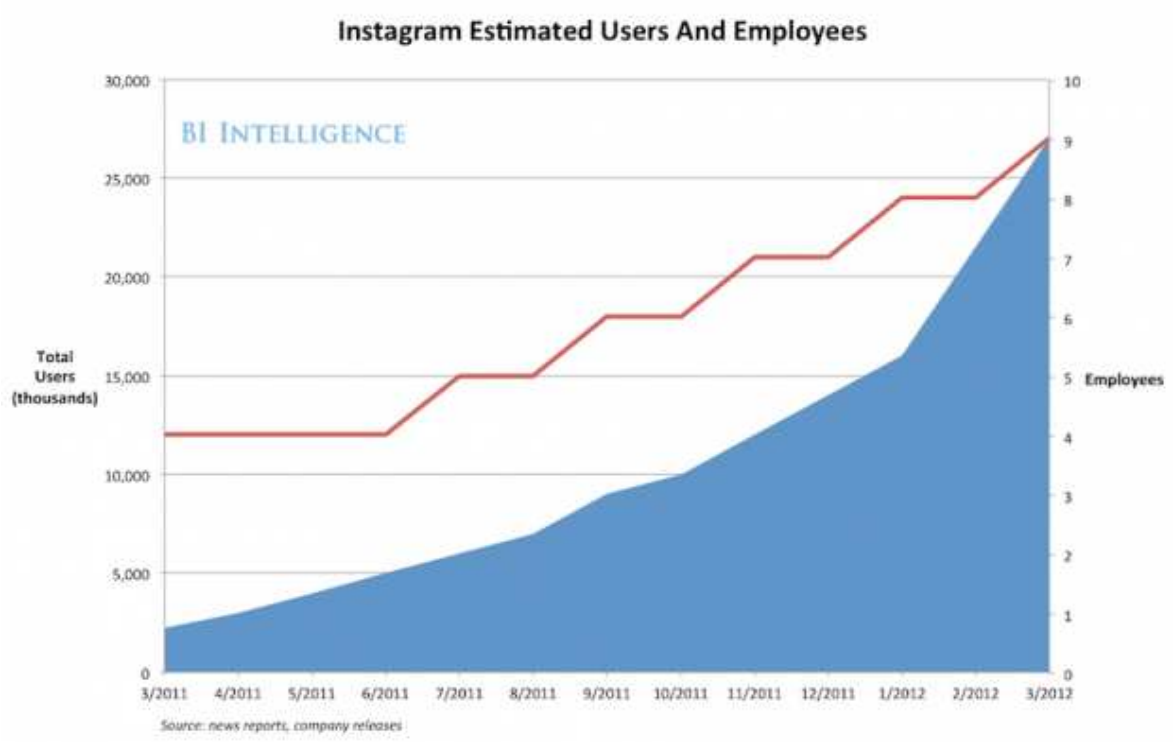
1.2.1. Major digital economy firms are often young enterprises that were designed from the outset to make the most of tax laws.

The innovation dynamics that are characteristic of a venture capital economy lead to the pursuit of high returns to scale. The failure rate is so high in the digital economy, that successful startups must achieve a high valuation in order to maintain the internal rate of return for venture capital firms. The objective of returns to scale relies on the notion of "scalability": a business is "scalable" if it generates exponential returns to scale, in other words, if it can increase its sales without significant changes to its production structure. The figure below shows the relative slopes of the curves tracking the number of Instagram employees and the number of Instagram users.

[79] CE, 31 March 2010, Nos. 304715 and 308525, *Société Zimmer Limited*.

[80] Transfer prices, or internal sales prices, are the prices applied to "all intercompany or cross-border transactions". These are the prices of all types of transactions: purchases and sales of goods and services, royalties, interest, security, fees, sale or licencing of intellectual property, including brands, patents and know-how, invoicing of costs, etc. See DIRECTION GENERALE DES FINANCES PUBLIQUES, "Les prix de transfert : lexique et exemple d'analyse fonctionnelle" http://www.impots.gouv.fr/

Instagram's "scalability"[81]



This makes it easy to understand why special efforts are focused on making the best use of the applicable tax rules from the outset:

- Locating the group's entities to take advantage of favourable clauses in bilateral tax treaties ("conduit countries");
- Locating intellectual property, which accounts for the bulk of profits, in countries that offer favourable direct tax systems, such as tax havens;
- In the European Union, locating sales of online services in the Member State with the lowest VAT rate (Luxembourg).

Unlike mature companies, digital economy companies do not need to restructure their businesses at regular intervals.

- A large multinational group undergoes periodic business restructuring to minimise its effective tax rate. In so doing, it often encounters internal resistance and incurs legal and financial risks with regard to tax authorities, which are always wary of restructuring moves.
- A recent startup that can scale up its business rapidly does not have to undertake such restructuring. The best tax choices were made at the outset in order to reap the benefits when the group reaches global scale.
- Therefore, it is necessary to consider that, at each critical step in such companies' development, including the first funding round (Series A[82]), the legal structure of the business incorporates the objective of minimising the effective tax rate right from the beginning in the event that the company is successful and achieves international

[81] Pascal-Emmanuel GOBRY, "These Simple Charts Show Why Instagram Is Clearly Worth At Least $1 Billion," *Business Insider*, 9 April 2012. http://articles.businessinsider.com/

[82] Elad GIL, "How Funding Rounds Differ: Seed, Series A, Series B, and C...," *Elad Blog*, 15 March 2011. http://blog.eladgil.com/

business growth. The "Double Irish and Dutch Sandwich" and its variations are probably used by most of the companies with venture capital funding[83].

- In all events, this type of arrangement is now used by all of the major American digital economy firms, such as Google[84], Apple[85], Amazon[86], Facebook[87] and Microsoft[88].

The "Double Irish and Dutch Sandwich"

The "Double Irish and Dutch Sandwich" is a tax planning strategy used by American groups that involves three distinct jurisdictions: Ireland, the Netherlands and a tax haven that has little or no income tax (e.g. Bermuda, Cayman Islands or Gibraltar).

The parent company's intellectual property rights outside the United States are sold or licensed to an Irish subsidiary, where the entrepreneurial risk-taking functions are performed by a permanent establishment in a tax haven. All of the profits earned outside the United States and attributed to the intellectual property will be reported by the latter subsidiary and, unless they are transferred to the American parent, they will not be taxed by the American tax authorities (consolidated global earnings system combined with "checking the box").

The Irish subsidiary controls a second Irish subsidiary ("Double Irish"), that reports the sales made outside the United States, and records the relevant revenue. The second subsidiary generally offsets the bulk of its profits by paying intellectual property royalties to a permanent establishment of its parent company located in a tax haven. This payment is made through a Dutch subsidiary ("Dutch Sandwich") to take advantage of the favourable clauses in the tax treaty between Ireland and the Netherlands and the fact that the Netherlands does not levy a withholding tax when the counterparty, in this case, the permanent establishment that performs the entrepreneurial risk-taking functions of the Irish subsidiary, is located in a tax haven.

The untaxed profits are then stored up in the tax haven and can be used for capital expenditure or acquisitions outside the United States. However, they cannot be transferred to the United States, to pay a dividend or to fund capital expenditure, for example, without being subject to corporate income tax. When Congress grants "tax holidays" under exceptional circumstances, the profits earned in the rest of the world can be repatriated under more favourable tax rules. The last "tax holiday" in the United States took place in 2004.

1.2.2. Digital economy firms do not pay dividends

As a rule, digital economy companies do not pay dividends to their shareholders, which makes it easier to shift their profits to more favourable tax jurisdictions. Some of these companies have recently had very high earnings, leading to a dramatic increase in their cash holdings. This is particularly true for Apple, Microsoft, Cisco, Google, Oracle and Qualcomm (see table below). According to Moody's, Apple alone accounts for 36% of the increase in major American group's cash reserves between 2009 and 2011. Without Apple, these cash reserves would have diminished by 6 billion dollars over the same period[89].

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[83] *Cf.* See, for example, the tax planning of Spotify, described by Philippe ASTOR, "Digital Jukebox – Enquête sur la nébuleuse des holdings de Spotify," *Electron libre*, 26 November 2010. http://www.electronlibre.info/

[84] Jesse DRUCKER, "Google 2.4% Rate Shows How $60 Billion Lost to Tax Loopholes," *Bloomberg*, 21 October 2010. http://www.bloomberg.com/

[85] Charles DUHIGG et David KOCIENIEWSKI, "How Apple Sidesteps Billions in Taxes," *The New York Times*, 28 April 2012. http://www.nytimes.com/

[86] Ian GRIFFITHS, "Amazon: £7bn sales, no UK corporation tax," *The Guardian*, 4 April 2012. http://www.guardian.co.uk/

[87] Robert W. WOOD, "Facebook Mirrors Google's Offshore Tax Scheme," *Forbes*, 27 December 2012. http://www.forbes.com/

[88] Colm KEENA, "Irish subsidiaries helped Microsoft reduce US tax bill by €1.87bn in 2011," *The Irish Times*, 22 September 2012. http://www.irishtimes.com/

[89] Cardiff GARCIA, "A US corporate cash update," *FT Alphaville*, 14 March 2012. http://ftalphaville.ft.com/

Cash holdings of major American groups[90]

Rating	Company Name	Date	Cash & Cash Equivalents	Liquid ST & LT Investments	Total Cash
NR	Apple	12/31/2011	$10,310	$87,291	$97,601
Aaa	Microsoft	12/31/2011	$10,610	$41,126	$51,736
A1	Cisco Systems	1/28/2012	$8,561	$38,181	$46,742
Aa2	Google	12/31/2011	$9,983	$34,643	$44,626
A1	Pfizer	12/31/2011	$3,539	$31,707	$35,246
Aaa	Johnson & Johnson	1/1/2012	$24,542	$7,719	$32,261
Ba1	General Motors	12/31/2011	$15,499	$16,148	$31,647
A1	Oracle	11/30/2011	$13,286	$17,726	$31,012
Ba1	Ford Motor Company	12/31/2011	$22,949	$0	$22,949
NR	Qualcomm	12/25/2011	$4,964	$17,014	$21,978

Digital economy companies are not the only ones not to pay dividends. Before 2003, when the Jobs and Growth Tax Relief Reconciliation Act of 2003, submitted to Congress by President George W. BUSH came into force, capital gains tax rates were lower than taxes on dividends, which meant that investors preferred to sell shares at a profit rather than receive dividends. Lowering tax rates on dividends restored the tax neutrality of investors' choice between dividends and capital gains. Despite some controversy during the presidential election campaign[91], the alignment of dividend tax rates on capital gains tax rates was not an issue in the recent negotiations between the President and the United States Congress on the looming fiscal cliff[92].

Furthermore, many American exporting companies do not pay dividends on their earnings outside the United States.

- Unlike other developed countries[93], the United States taxes its multinational groups' earnings under the consolidated global earnings system. Combined with "check the box" regulations that allow American groups not to report some of their foreign entities as corporations, this system enables the groups to store up their earnings from foreign subsidiaries and avoid federal corporate income tax[94], as long as the funds are not repatriated to the United States.
- This explains why many companies do not pay dividends on these earnings. Instead of repatriating them to the United States, they used the cash they hold abroad to finance capital expenditure and acquisitions in other countries (see diagram below). Given the current low level of interest rates, it is easy for companies to finance capital expenditure and acquisitions in the United States by borrowing, since the cost of

[90] Cardiff GARCIA, *ibid.*

[91] The capital gains tax rate in the United States was the subject of heated debate at the start of 2012, after the average tax rate on the income of the Republican presidential candidate, Mitt ROMNEY, was revealed. See Paul BLUMENTHAL, "Mitt Romney's Tax Returns Show 13.9% Tax Rate, Highlight Challenges For Wealthy Candidates," *The Huffington Post*, 24 January 2012. http://www.huffingtonpost.com/

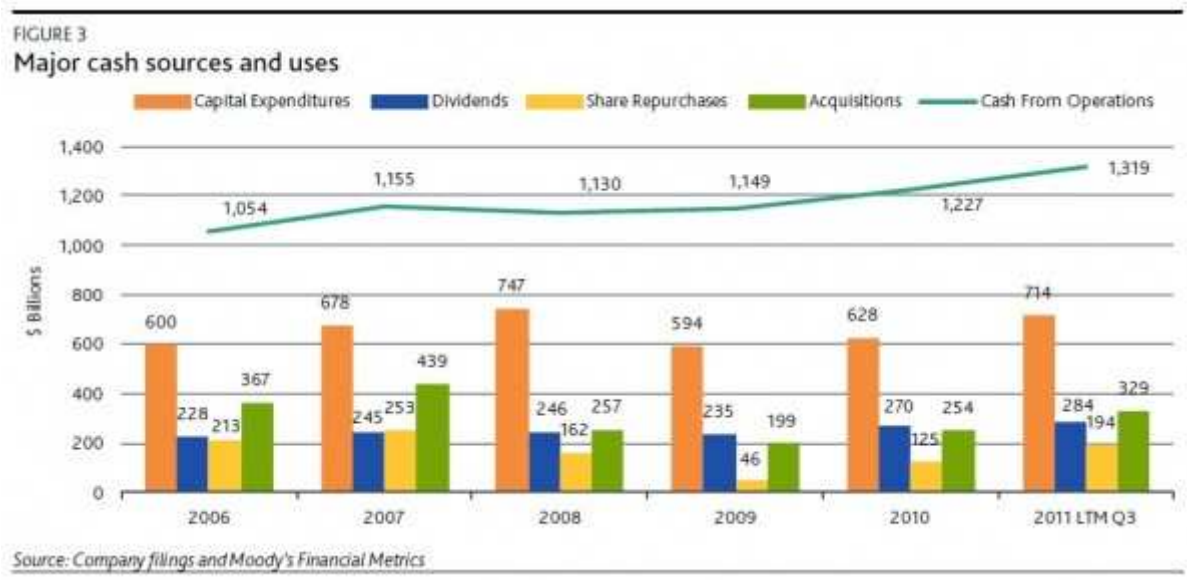
[92] Dan CAPLINGER, "How the Fiscal Cliff Deal Saved Dividend Stocks," *Daily Finance*, 15 January 2013. http://www.dailyfinance.com/

[93] In 2011, France eliminated the consolidated world earnings system, an option that was available subject to the approval of the tax authorities.

[94] At a rate of 35%, one of the highest in the OECD.

borrowing is lower than the amount of tax that would be levied if foreign earnings were repatriated to the United States.

Major groups' cash sources and uses[95]



However, there are three specific features of the digital economy that explain why the companies in it hardly ever pay dividends, even when they are making a profit.

- The prevailing entrepreneurial culture means that digital economy firms reward their executives and employees with massive stock option distributions. When the holders of these options exercise them, the number of shares increases and systematically dilutes the holdings of other shareholders[96] and, in listed companies, this can have a negative impact on the share price. To avoid this, companies periodically buy back their shares to stabilise the number of outstanding shares. Despite the constraints and cost of paying shareholders by buying back their shares, it is a way of avoiding the need to pay dividends.
- Paying dividends attracts investors who demand more return. When a listed company starts to pay dividends, the capital markets feel that the first dividend payment commits the company to making further periodic payments that must increase over time, or else they will see their share price fall[97]. In the digital economy, committing to periodic payments for shareholders incurs the risk of a shortage of resources for capital expenditure to keep up with or anticipate trends in a constantly changing market. This is why many digital economy firms prefer not to start paying dividends.
- Ultimately, not paying dividends has simply become part of the corporate culture of digital economy companies. For many executives, paying dividends is a signal that their company is no longer growing and that it has become a mature company, entrenched in a clearly identified market, that enjoys a dominant position. But maturity is seen as a

[95] Cardiff GARCIA, *ibid.*

[96] For example, in 2002, Dell had 2.6 billion shares in circulation and its employees had the potential to exercise options for 360 additional shares, or 12% of the company's ultimate capital. See Daniel GROSS, "Why cash-rich companies like Dell and Microsoft don't (and won't) pay dividends," *Slate*, 14 Javier 2003. http://www.slate.com/

[97] "*The market on average penalises decreases in dividends four times as much as it rewards increases.*" *in* Palash R. GHOSH, "Apple: Why Won't They Pay Dividends?," *International Business Times*, 27 February 2012. http://www.ibtimes.com/

sign that the pace of innovation has slackened, marking a major shift in the strategy of such companies, which believe and proclaim, rightly or wrongly, that innovation is still at the heart of their business models[98]. Several observers noted an apparent correlation between Microsoft's decision to start paying dividends in 2003 and its sluggish performance in terms of innovation[99]. Similarly, Cisco paid a dividend for the first time in 2011, *after* withdrawing from the consumer product market and trimming its growth forecasts[100].

Consequently, digital economy companies' tendency to not pay dividends is a cultural trait. Their determination to reinvest all of their earnings in innovation or expanding their business makes them formidable competitors in any market where they take up a position. Not paying dividends, combined with the ease with which they shift their profits to favourable tax jurisdictions means that they do not have to pay taxes on these profits. This gives them more capacity for capital expenditure than other companies. Minimising effective tax rates by not paying dividends is a central component of the business model used by innovative digital economy firms[101].

Naturally, paying dividends is not an issue for companies that do not make a profit. Many digital economy companies hold advantageous market positions while they are still growing and before they reach their breakeven point. This was the case for Instagram, for example, when Facebook acquired it for a billion dollars in March 2012. For such companies, it is crucially important to minimise their effective tax rate worldwide and pay the minimum in taxes (including corporate income taxes) in the various countries where they do business.

1.2.3. The digital economy ecosystems make it easier to use multi-sided business models

A multi-sided business model is for a company that acts as an intermediary between different categories of customers and users. The value added in such a model is based on the interactions between the customers and users on the different sides of the model. The externalities of one side for another side make economic analysis more complicated. They make identifying the relevant costs and markets more difficult for the purposes of enforcing competition law. In a two-sided model, the prices reflect the effects of the externalities. If one side has a positive externality for the other side (for example more clicks by users in the Google search engine on links sponsored by advertisers), then the prices can be increased. On the other hand, a negative externality from one side for the other side (e.g. displays of intrusive and unattractive advertising banners), it can be offset by a lower price, or even no charge or a reward for users.

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[98] As recently stated by Peter THIEL, one of the founders of PayPal and an investor in Facebook, in a debate with Eric SCHMIDT, Chairman of Google, *"the intellectually honest thing to do would be to say that Google is no longer a technology company, that it's basically - - it's a search engine. The search technology was developed a decade ago. It's a bet that there will be no one else who will come up with a better search technology. So, you invest in Google, because you're betting against technological innovation in search. And it's like a bank that generates enormous cash flows every year, but you can't issue a dividend, because the day you take that $30 billion and send it back to people you're admitting that you're no longer a technology company. That's why Microsoft can't return its money. That's why all these companies are building up hordes of cash, because they don't know what to do with it, but they don't want to admit they're no longer tech companies."* See Adam LASHINSKY (moderator), "Transcript: Schmidt and Thiel smackdown," *CNNMoney*, 17 July 2012. http://tech.fortune.cnn.com/

[99] Roger CHENG, "Why technology companies loathe dividends," *CNET*, 19 March 2012. http://news.cnet.com/

[100] Roger CHENG, *ibid.*

[101] It is also a decisive component of their financial and industrial communication, since investors do not acquire shares because of the dividends, but because of the company's upside potential and innovation, its market share, its ability to make the right strategic decisions and untapped markets.

Once again, digital economy firms are not the only ones to use multi-sided business models.

- A bank is a long-standing example of a multi-sided business model: on one side, the bank takes deposits from its retail banking customers and, on the other side, it leverages those deposits to make loans or invest in financial markets. Retail banking was essentially a free service for a very long time: just depositing spare cash in a bank created a positive externality for the credit market and was offset by free retail banking services.
- Media financed through advertising revenue are another example of a multi-sided business model. The information and entertainment content attracts an audience. The attention of this audience is a positive externality that is then used to make money from advertisers by charging prices that depend on the size and quality of the audience, as well as the market position[102]. Free television channels, radio stations and newspapers that are financed in whole or in part by advertising are examples of this business model in the media.
- Shopping malls are a third example of multi-sided business models. The function of a shopping mall is to attract consumers. Their proximity and their willingness to buy create a positive externality for the merchants and justify the rents that they have to pay to the shopping mall. Some brands have great drawing power, which creates a positive externality for the other merchants. This justifies lower rents paid by their stores. The discount on their rent indicates the value of the brand.

The novelty of the digital economy lies in the possibility of locating the different sides of the same business model in different countries.

- For example, the users of the Google search engine may be located in France, Germany or the United Kingdom. But the contracts with advertisers, on the other side of the business model, are officially signed by an Irish company that invoices and collects the advertising revenue, and then reports the profits from this business to the Irish tax authorities.
- This situation is similar to the one, which has not yet become common practice, given the market position of French banks, of a French bank doing business under the freedom to provide services[103] in another Member State that takes deposits from French residents, and then makes its revenue by lending to residents of the host Member State, where it would then declare all of its profits and thus not pay any corporate income tax to the French government.
- Similarly, in the television business, the standards related to broadcast regulations prevent a television channel that is not located in France from broadcasting over the air

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[102] Patrick LE LAY, the CEO of France's TF1 television network at the time was interviewed along with other executives in a book on business leaders and change (*Les dirigeants face au changement* (Editions du Huitième jour)). He stated the following:

"We can talk about television in many ways. But, from the business point of view we should be realistic: basically, TF1's job is to help Coca-Cola, for example, to sell its product (…).

But, for an advertising message to sink in, the viewer's mind must be ready. Our broadcasts are intended to prepare this mind, by entertaining it and relaxing it between two commercials. What we are selling Coca-Cola is time when human brains have been prepared to take in messages (…).

"There is nothing harder to obtain than this state of readiness. Therein lies the need for constant change. We must continually seek programmes that are popular, follow fashion and ride the trends in a situation where information is accelerating, proliferating and being commoditised."

See the AFP dispatch of 9 July 2004, which was cited in the article titled "Patrick Le Lay, décerveleur," *Libération*, 10 July 2004. http://www.liberation.fr/

[103] See Directive 2006/48/EC of the European Parliament and the Council of 14 June 2006 relating to the taking up and pursuit of the business of credit institutions and Articles L.521-11 and the following articles of the French Monetary and Financial Code.

from another country for a French audience without having an establishment in France[104].

- On the whole, sector specific rules (mandatory establishment in France for the purposes of sector regulation) or physical constraints requiring a permanent establishment in France meant that companies have been prevented in the past from exploiting the full potential of tax planning under their multi-sided business models.

The French tax court has had occasion to deal with this business model. In 1968, the Council of State, France's supreme tax jurisdiction, handed down a ruling on the taxation of the profits of a company with its headquarters in the Principality of Monaco that took orders from French clients for radio advertising messages that were broadcast to French listeners[105]. The ruling stated that such a company, which conducted a "complete business cycle" in France, should be considered a "company operating in France," within the meaning of the General Tax Code, and that its profits were taxable in France. This case law, which could potentially be applied to online services financed by advertising, is of limited application because of the systematic inclusion of clauses in tax treaties that restrict the power to levy taxes to the government of the country where the company concerned is established. The same radio station broadcasting to France from Ireland and signing contracts with its advertisers from Ireland would not be required to declare its profits in France or pay corporate income tax in France.

All of these examples do suggest that it is anomalous for digital economy companies to be structured the way they are, especially if the services provided are free. We would find it counter-intuitive for an over-the-air television channel or a retail banking institution with substantial market shares in France to pay virtually all of their corporate income tax to the government of another Member State of the European Union on the grounds that the services provided in France, on only one side of their business model, are free. In a way, it is just as counter-intuitive for digital economy firms to provide free services to users on the French market and make money from the positive externalities created by these users solely through foreign companies, without providing any tax revenue for the French government. This situation is the result of a meticulous business model design to the constraints of current tax laws with the overriding objective of minimising the effective tax rate.

Part of the reason that the digital economy lends itself to tax evasion so well is that the dominant business models are multi-sided. Multi-sided business models constitute the foundation of the ecosystems developed by the major digital economy firms. There are two main categories of these business models.

- Horizontal service package models are used for operating several applications that provide complementary services. Google is now present in related markets with different products: Search, AdWords, AdSense, YouTube, Chrome, Gmail, Maps, Android and, increasingly, "vertical" search engines, such as Hotel Finder or Google Books, along with Google Wallet and, soon, Google Car. This creates two types of synergy: on the one hand, the various activities pool their software resources and, more specifically, user-generated data; on the other hand, the activities may be put into a package that is more attractive for users, as shown by the results page of the Google search engine, which combines results from the Web with results from YouTube, Google Maps, Google Hotel Finder, Google Scholars and others.

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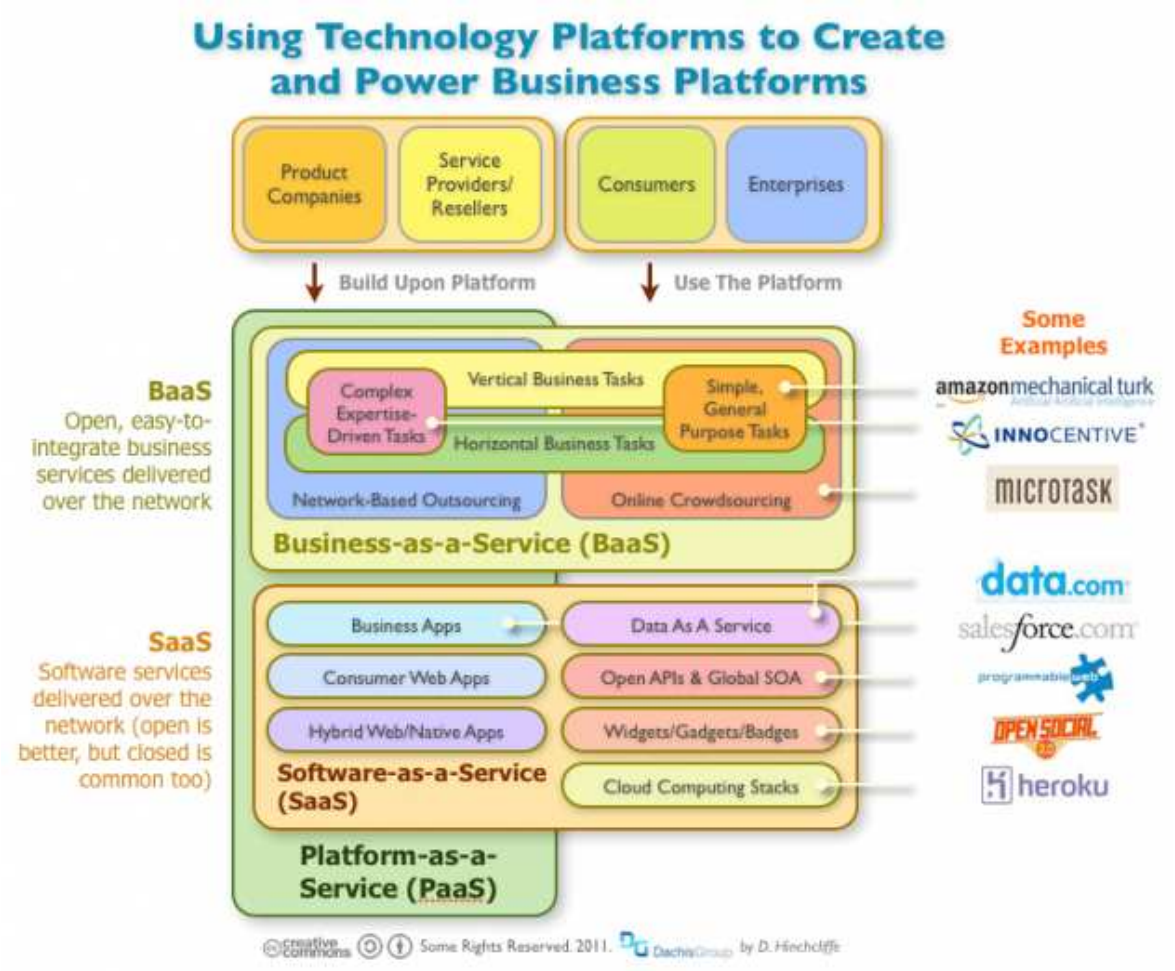
[104] On the other hand, television programmes may be broadcast over networks that do not use the wavelengths assigned by the Broadcasting Council without any preliminary formalities, making it possible to locate the two "sides" of the business model in two different countries. This would be the case, for example, for programmes that fall within the jurisdiction of another Member State of the European Union or that are covered by the European Convention of Transfrontier Television of 5 May 1989. See Article 43-7 of Act 86-1067 of 30 September 1986 on the Freedom of Communication, as amended.

[105] CE 13 July 1968, No. 66503, société X, Lebon p. 454.

- Vertical platform models are used to make resources available for third-party developers[106]. The platform minimises the developers' initial investment and facilitates their access to the market. For example, applications sold through Apple's App Store are cheap to develop and have the potential to reach all users of Apple devices. A software platform is the result of large-scale development of an application. Once a certain volume is reached, the platform is no longer able to satisfy all of its users and it must open an application programming interface (API) for developers, whose activity then gives rise to an ecosystem. Macintosh, developed by Apple at the time, and the Windows operating system, Microsoft's flagship product, are the first great software platforms in history. More recently, Apple, Amazon, Facebook, Twitter, Salesforce and many other companies have copied and diversified this model to consolidate their dominant positions in their respective markets, shifting it to the "cloud", which means that the resources that they provide to developers remain on their own servers (cloud computing).

The different functions of software platforms[107]



[106] Or *"complementors,"* see Kevin J. BOUDREAU and Andrei HAGIU, "Platform Rules: Multi-Sided Platforms as Regulators," *working paper*, Harvard Business School, 24 October 2008. http://hbswk.hbs.edu/

[107] Dion HINCHCLIFFE, "Are We Building Businesses? Or Are We Building Platforms? Yes.," 18 October 2011. http://dionhinchcliffe.com/

Turning an application into a platform is the most common way to build an ecosystem and consolidate a dominant position. The market for software, technology or service platforms is inherently a concentrated market. It would be hard for too many applications ecosystems to co-exist without interoperability problems arising. Consequently, strategies to transform applications into platforms are not always successful. In some cases, the platform fails to attract developers, as shown by the troubles of Nokia's application platform[108] or the closure of the WebOS platform that HP was pushing for a while[109]. The source code for the latter was later made available as open source software. In other cases, a newly opened platform may attract many developers, but undermine the company at the heart of the ecosystem, if its business model has not matured yet or if its market position is too vulnerable. This is how Twitter's more restrictive terms for application developers[110] have been interpreted. The purpose is to bring users to the Twitter application, rather than letting them scatter to other applications that generate less advertising revenue for the company.

Some companies combine the platform model with more and more related activities. For example, Amazon runs a retail sales application that is a marketplace open to all sellers and a software platform (AWS) as well. Apple, which manufactures devices and equips them with an operating system, provides a platform for an ecosystem of developers as well, but it also offers its own applications, starting with its Web browser (Safari) and an application for listening to music (iTunes). The distinguishing characteristic of the digital economy giants is the extreme flexibility of their supply of services and their business models, which are constantly changing and combine more and more software products that can be run on users' own computers, online services that are accessible with a Web browser, cloud computing platforms, such as Amazon Web Services or Microsoft's Azure, and even hardware, such as Apple's iPhone or iPad, Amazon's Kindle and Kindle Fire or Google's Nexus.

The dynamic growth of multi-sided business models stems from the possibility using several levers to maximise profits. Growth is regulated by price. This regulation may be combined with access restrictions and general terms of use that are favourable to the platform, or adaptation of designs and functions based on real-time analysis of use data[111]. A model where services are provided to consumers on one side, at no charge in some cases, has a powerful impact on the profits of the companies present on the other side of the model. On the one hand, it facilitates the reallocation of a significant share of the surplus by consumers and, on the other hand, it leads to a redistribution of the residual surplus between the customers on the other side of the model and the company operating the model, which is in touch with its users and takes full advantage of the network effects between the two sides of its business model.

1.2.4. Free services dominate the digital economy

The growth of non-monetary transactions and the transformation of value chains make it harder for tax systems to capture the digital economy. The "desertion" of money is a phenomenon that takes many forms: offering most online services to consumers for no charge with the aim of acquiring new users or collecting personal and behavioural data that are used to make money on another side of the business model, or else producing virtual currency, which is increasingly used to purchase a number of online goods and services.

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[108] Natasha LOMAS, "Innovate Or Die: Nokia's Long-Drawn-Out Decline," *Techcrunch*, 31 December 2012. http://techcrunch.com/

[109] Greg KUMPARAK, "It's Official: HP Kills Off WebOS Phones And The TouchPad," *Techcrunch*, 18 August 2011. http://techcrunch.com/

[110] Christina WARREN, "Twitter's API Update Cuts Off Oxygen to Third-Party Clients," *Mashable*, 16 August 2012. http://mashable.com/

[111] Kevin J. BOUDREAU and Andrei HAGIU, *ibid.*

1.2.4.1. Free services are a strategic preference

Offering free services is one of the most notable characteristics of the digital economy. There is nothing new about free services: many sectors of the economy, such as the media, used this model for their growth over the decades, with multi-sided business models that include revenue from advertising or, in the case of retail banking, revenue from loans and financial markets. But free services are even more important in the digital economy because of its low marginal operating costs.

Advertising revenue is not necessarily enough to cover the cost of offering free services, which makes many sectors of the economy vulnerable to economic problems. Consequently, there is some ambiguity in the assessment of free services: for some, it makes many services that are helpful for day-to-day living more accessible and it creates a substantial surplus for consumers that benefits the economy as a whole; for others, free services create and reinforce a systematic unwillingness to pay, which has direct and measurable negative effects on business models in certain sectors, particularly in the media and entertainment industries.

Offering free on-line services, underpinned by low marginal operating costs, is driven by clearly identified industrial or financial strategies:

- Putting the priority on acquiring new users: "*traction*" is the main leading indicator of success for a business seeking exponential growth of its returns to scale. Offering free services often provides a decisive advantage for triggering and expanding traction. It attracts users who are unwilling to pay and spares the other, rarer, users from the tedious task of making an on-line payment. In the digital economy, where fluidity is a cardinal value, requiring a payment will often deflect a substantial proportion of traffic because it abruptly interrupts the user experience.

  When a company chooses to offer free services to boost its traction, revenue and, where appropriate, profit, only come later on. For example, Facebook did not step up the expansion of its sales of advertising space until after its IPO and after it had succeeded in attracting more than one billion users to its platform. Revenue generation may only be a sideline, for instance when a free version of the application chosen by most users co-exists with a paid version of the same application that is used by only the most active users and those who are most willing to pay.

  The *freemium*[112] business model is based on using free services to acquire users and build loyalty. Users do not start paying until after they have started using the application and it becomes hard or even impossible for them to do without it[113]. When monetary transactions become unavoidable, they can be made painless by having users enter their bank details once and for all, thus sparing them the tedious task of making online payments[114]. Less absolute forms of the freemium model existed before the digital economy and were used in conventional strategies to win market share. The digital economy has radicalised this model and applied it on an unprecedented scale.
- Financing services with revenue from another side of the business model: many on-line services are provided for free because of the positive externalities that the users' activity generates for another side of the business model. Depending on the situation, the data from this activity can be used to target advertising and thus sell services to advertisers (Google and its advertising system), to enrich the company's information system and achieve productivity gains elsewhere (Amazon and its recommendations

[112] Chris ANDERSON, *Free: How Today's Smartest Businesses Profit by Giving Something for Nothing*, Hyperion, 2010. French translation: Chris ANDERSON, *Free ! Entrez dans l'économie du gratuit*, Pearson, 2009.

[113] The file hosting and synching service, Dropbox, is a prime example of a well-designed freemium model.

[114] Especially when a purchase can be made with one click, as is the case on Amazon.

engine), providing these data to applications developers through a platform (Facebook and its application platform) or simply selling or renting these data to third parties (which is what companies such as TripAdvisor, Bazaarvoice and Disqus do with users' opinions and comments, or Rapleaf does with the analysis of email message contents in the United States).

When free services are offered in a multi-sided business model, this strategy is all the more apt when users' activity is disinterested and even private, making a seemingly mercantile environment a poor fit. In this case, free services help paper over mercantile motives and give users more incentive to engage in a spontaneous and disinterested activity that generates greater positive externalities for the other side of the business model[115].

- Seeking return on capital from capital gains rather than from operating revenue: Many digital economy companies, including some that serve hundreds of millions of users, are operating their application at a loss. By choice or by necessity, they have not changed their initial business model, which was designed to produce traction, into a model that involves having users pay. Companies such as Twitter and Instagram have reached huge scales without seeking to generate substantial revenue or even make the slightest profit. Ultimately, the purpose of these strategies to be acquired by another company at a price that is high enough to reward the investment of the initial shareholders, as in the case of Instagram, which was bought by Facebook for one billion dollars, or to be listed on the stock exchange in order to continue financing growth with equity raised on the stock market instead of relying on venture capital.

  Companies that operate at a loss for long periods are not specific to the digital economy. However, such loss-makers are often subsidiaries of groups that cover their losses by writing them off against consolidated earnings, with the added effect of reducing the group's overall effective tax rate, which is crucial for the group's financial communication. The distinguishing characteristic of the digital economy is that these companies are financed, for several years sometimes, by venture capital funds with business models based on very high returns on a small proportion of their investments. This means these investors prefer return in the form of capital gains instead of dividends.

There are major consequences for domestic taxation. In brief, there are three situations where a digital economy company providing a free service in France is not required to report any profits or pay any corporate income tax to the French government:

- The application may be operating at a loss as part of a growth strategy, before turning a profit at a latter stage, as in the case of a freemium business model.
- The application may be generating positive externalities and be financed on another side of the business model by customers dealing with an entity that its not located in France.
- The application may be financed by a future capital gain to be realised by selling the company or listing it on the stock market once it has attained a global scale.

1.2.4.2. The rise of virtual currencies

Currency is an institution whose soundness is crucial for the smooth operation of the economy[116]**.** This makes it all the more peculiar that currency should also be affected, and

[115] For more on this subject, see Dan ARIELY, *Predictably Irrational, The Hidden Forces that Shape Our Decisions*, Harper Collins, 2008, especially the chapters "The Cost of Zero Cost," "The Cost of Social Norms," "The Power of a Free Cookie" and "The Power of Price."

[116] For an introduction, see François RACHLINE, *D'où vient l'argent ?*, Panama, 2006.

possibly even transformed in the near future, by the growth of the digital economy.[117] One manifestation of this phenomenon is the appearance and development of virtual currencies. Issuance of these virtual currencies is not regulated by a central bank, but by private operators that may or may not be for-profit enterprises. The ultimate purpose of virtual currencies is to make exchanges more fluid and accelerate the circulation of money, even in the midst of the liquidity shortage stemming from the world financial situation. Virtual currencies are used to maximize opportunities for creating value, to protect jobs or to generate profits. Experiments with alternative new currencies are proliferating around the world, driven by private companies, some NGOs and even local governments. In the last few years, virtual currencies have even been used in several areas of France[118].

The growth of virtual currencies also has the potential to affect taxation. The issues are already familiar outside the digital economy, since customer loyalty programmes in all sectors have long circulated virtual currencies in the form of loyalty points, coupons and the famous airline "miles". The related tax issues are complex with regard to both VAT and corporate income tax, but the tax authorities have been able to deal with them in most cases. In the digital economy, the growth of digital currencies is likely to take place on a much larger scale and still be beyond the reach of national laws. This growth occurs in two different ways:

- The first consists of creating a virtual currency that is specific to an ecosystem that is clearly circumscribed and operated by a single company. This currency is created for two purposes. It is created to capture demand and keep users inside the ecosystem. The other purpose is to overcome the reluctance to pay that is observed each time a user has to use a payment medium. The effect on taxation is comparable to that created by an intermediary in marketplace models. The issuer of the virtual currency, such as Facebook with Facebook Credits[119], sets itself up as an intermediary between consumers on the one hand, and corporations or individuals on the other hand. The issuer uses its virtual currency to collect compensation and exert market power within its ecosystem, or to optimise its business model by offering some incentives through gamification[120].
- The second objective is to create virtual currency that is accessible to everyone. For example, the Bitcoin system is both a virtual currency and a protocol for secure exchanges[121]. The Bitcoin issuance policy overseen by software that is designed to prevent inflation and thus ensure the convertibility of the currency as much as possible. The circulation of Bitcoins relies on fully distributed software architecture that runs on the users' computers, with no central server. Economic agents are free to choose whether they will use the Bitcoin system. The blogging platform, Wordpress, for example, accepts payment in Bitcoins, thus facilitating access to its services for bloggers in poor countries[122]. In France, the Central Bitcoin platform now has an agreement with

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[117] Jean-Michel CORNU, *La monnaie, et après ? Guide des nouveaux échanges pour le XXIe siècle*, FYP, 2012.

[118] Sandra MOATTI, "Le boom des monnaies parallèles," *Alternatives économiques*, No. 249, July 2006. http://www.alternatives-economiques.fr/

[119] Facebook Credits are used to access certain functions in the video games available on the Facebook platform.

[120] For example, Quora Credits are awarded to the most active users of the Quora application, who enjoy the highest status in the user community. These users can spend their Quora Credits to make their contributions more visible in the application. *See* Alexia TSOTSIS, "Quora Gamifies: Credits And "Ask To Answer" Suggestions Live For Everyone," *Techcrunch*, 14 November 2011.

[121] David LAROUSSERIE, "Avec Bitcoin, payer et vendre sans les banques," *Le Monde*, 29 November 2012. http://www.lemonde.fr/

[122] Jon MATONIS, "What's Your Bitcoin Strategy? WordPress Now Accepts Bitcoin Across The Planet," *Forbes*, 16 November 2012. http://www.forbes.com/

the payment services provider, Aqoba, and Crédit Mutuel to operate payment accounts denominated in Bitcoins[123].

The growth of virtual currencies raises questions that relate primarily to macro-economic issues. The European Central Bank has already looked into this matter[124]. However, from the tax point of view, this growth facilitates the narrowing of the scope for monetary transactions and it also facilitates the optimisation of their geographical attribution in order to, when possible, shift the resulting profits to the most favourable tax jurisdiction.

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The fact that money has "deserted" parts of the digital economy has consequences for taxation. Free services maximise the consumer surplus. Consumers find the same services at lower prices than outside the digital economy. Virtual currencies in the digital economy have not yet been captured for tax purposes, since the companies that use them are not required to declare their profits in France.

[123] Stanislas JOURDAN, "Banco ? Bitcoin fait son trou dans la banque", *Ouishare*, 8 December 2012. http://ouishare.net/

[124] EUROPEAN CENTRAL BANK, *Virtual Currency Schemes*, October 2012. http://www.ecb.int/

2. Data generated by the "free labour" of application users are the core of value creation

The aim of this report is to make sustainable proposals that depend as little as possible on the state of technology and the market at the time of this writing. This aim is a challenge in the case of the digital economy, where the dynamics of constant innovation concern more than just technology and product design; these dynamics also affect business models[125], design, strategy and business development.

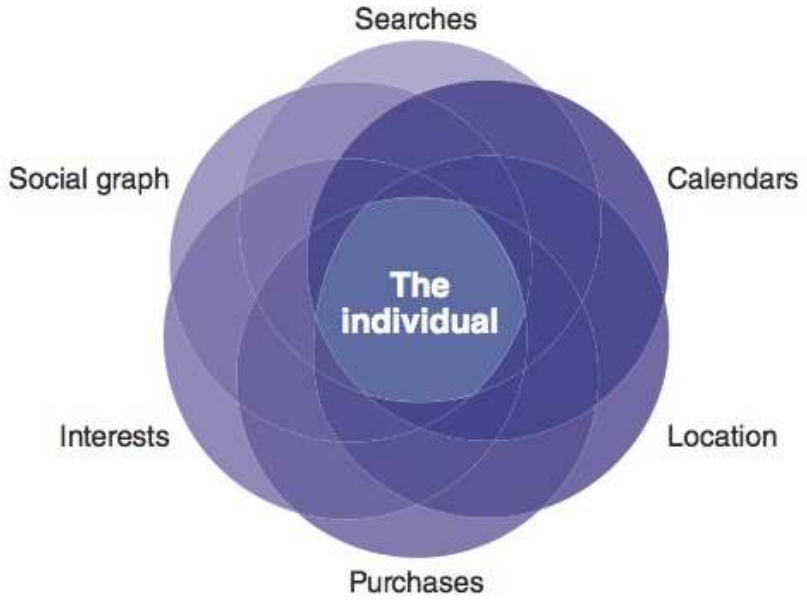
The previous section hinted at the difficulty of applying a specific type of taxation to a given activity sector or business model in the digital economy. There are two clear dangers. The first is that the definitions chosen will not stand up in actual use and thus deprive the tax system of its ability to raise revenue or create incentives. The second is that the specific type of taxation will be applied only to sectors with the most mature business models, without realising that the digital economy is spreading to all sectors of the economy and that one of its distinguishing characteristics is shifting business models. Yet, when an activity sector or a business model reaches maturity, it always means that one or two companies have dominated the market, so that the negative impact of any specific type of taxation primarily affects the dominant companies' customers and competitors, and their French competitors in particular. *This is why it is crucial for taxation of the digital economy to be based a common denominator found in all of the various business models in all sectors.*

Data generated by user activity constitute the common denominator for the entire digital economy. Users are active in every online application and their activity can be captured in the form of data. Data flows are the lifeblood of the entire digital economy. These data flows include histories of Google searches and clicks; shared data and interactions on Facebook; histories of pages visited and purchases made on Amazon, location data, contacts, photos, calendars and music on iPhones and iPads.

[125] Scott D. ANTHONY, "The New Corporate Garage," *Harvard Business Review*, September 2012. http://hbr.org/

Users at the centre of personal data[126]

FIGURE 1: INDIVIDUAL END USERS ARE AT THE CENTER OF DIVERSE TYPES OF PERSONAL DATA



Source: Davis, Marc, Ron Martinez and Chris Kalaboukis. "Rethinking Personal Information – Workshop Pre-read." Invention Arts and World Economic Forum, June 2010.

Data flows are the lifeblood of the digital economy and neutral from three angles:

- Data are neutral with respect to business models: Data are at the heart of the digital economy because the technologies that underpin this economy are aimed at using data, not just for targeting advertising, but also, and more importantly, as inputs in production chain. Data used this way can generate productivity gains, enrich and customise offers of products and services, expand business, diversify business activities, provide decision-making aids that are increasing incorporated into the production process in real time, or simply increase customer numbers and loyalty within an ecosystem that can be marketed on all fronts: retail sales, payment services, content provision, games, paid applications, sales of devices and related objects, provision of services through the related objects.
- Data are neutral with respect to technology, which is constantly evolving on two fronts: on the one hand, users are diversifying their devices (computers, smartphones, tablets) and the range of connected objects will grow (televisions, automobiles, transportation tickets, bank cards, household appliances, medical equipment, robots) and diversify, complicating business models; on the other hand, the servers used to execute code are becoming less physical and more virtual as cloud computing develops. After all, the technological unity of the digital economy lies primarily in the information code used (1 and 0) and the architecture of the networks used to circulate this information (Internet). This means that the only technological fixed points are *networks* and *data*. All other technological dimensions of the digital economy are constantly changing,

[126] WORLD ECONOMIC FORUM, in collaboration with BAIN & COMPANY, *Personal Data: The Emergence of a New Asset Class*, January 2011. http://www.bain.com/

which makes it impossible to use them in a tax system that both fosters industrial development in France and protects consumers' interests[127].

- Data are neutral with regard to business location strategies: In the digital economy, the notions of locations where data are stored and processed do not make much sense. Cloud computing has meant that the execution of code has migrated into network layers that are more and more difficult to attribute to a specific country. Hosting data and programs on remote servers is an increasingly virtual business, where logical layers (software) overlap with physical layers (hardware). Ultimately, tax planning could even be based on constant circulation of data and computer code, according to the principle of dynamic distribution to servers around the world so as to avoid any permanent location in a given country. Unlike the place where computer code is executed, the *place where data are collected* can be authoritatively ascertained, since it is the place where a person uses the application.

2.1. Data flows are the lifeblood of the digital economy

2.1.1. Technological progress led to the emergence of Big Data.

The declining cost of computing power is one constant in the growth of the digital economy and a decisive factor for innovation. In recent years, this computing power has been used to serve the specific new needs of huge new information systems capable of providing real-time service to hundreds of millions of users. Applications have never required such levels of performance[128] in the entire history of computing. At the same time, there has never been such a great capacity to collect data, store them cheaply and break them down for processing to meet the specific functional needs of an application or an ecosystem of applications. Massive capital expenditure by major digital economy firms, communities of free software developers and, in some cases, governments, has given rise to new technologies designed to collect, store and process huge volumes of data generated by the activity of users of online applications within the framework of innovative business models.

2.1.1.1. Application Programming Interfaces (APIs)

Application programming interfaces (APIs) are points of access to Web services or software resources (data and executable programs) that developers can use and incorporate into external applications, but which remain on the server of the owner of the resources. The theoretical formalisation of APIs was set out in the doctoral thesis by Roy Fielding that developed the theory for the REST (*Representational State Transfer*)[129] architectural style in 2000. Salesforce was founded the same year and introduced the first API to the market. This

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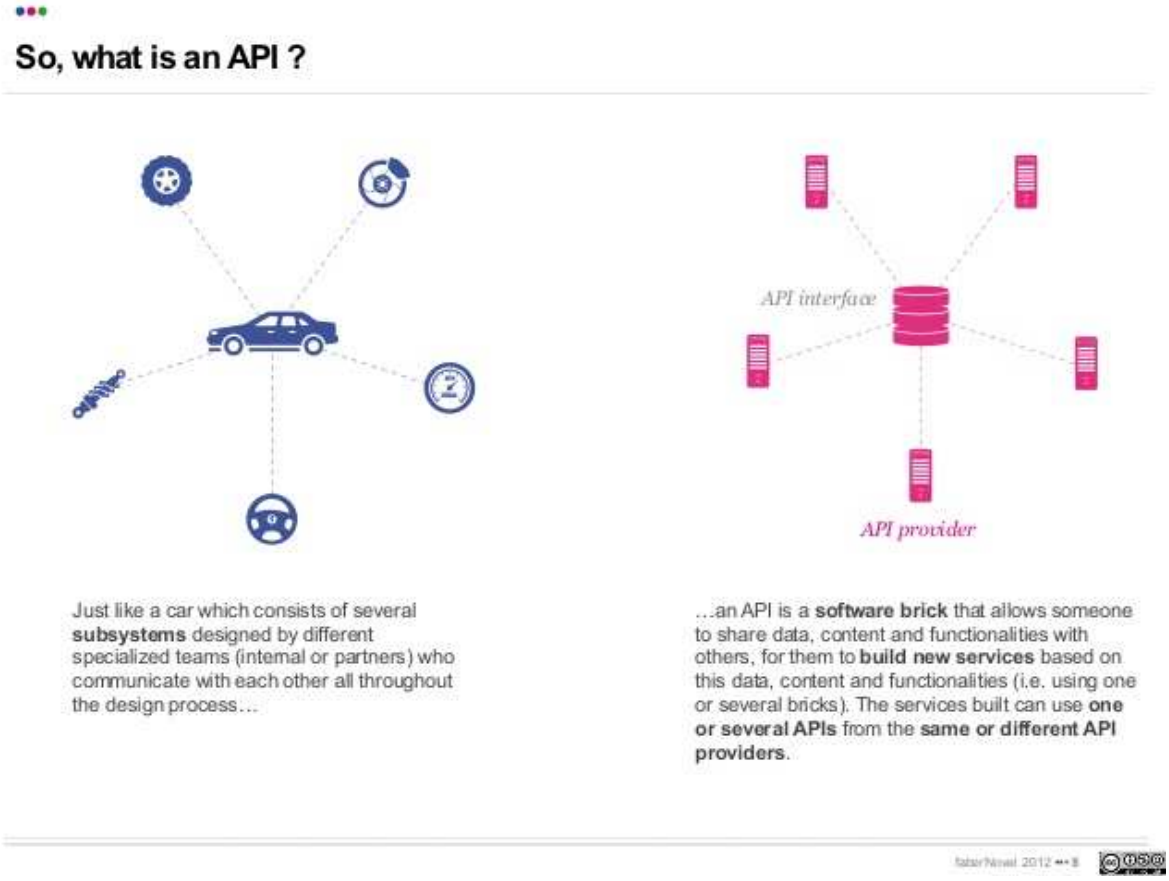
[127] On the other hand, constant adaptation and adjustment of the television tax or, in a non-tax matter, the rules on royalties for private copies of copyrighted material has been required to keep pace with technology and the diversification of both devices and access modes to copyrighted material on the Internet. This has had negative effects on economic neutrality, the industrial development of French companies and the legal quality of the provisions. Furthermore, defending successive measures has entailed a political cost.

[128] For details about Facebook, see PINGDOM, "Exploring the software behind Facebook, the world's largest site," *The Royal Pingdom Blog*, 18 June 2010. http://royal.pingdom.com/

[129] REST is an architectural style used to expose software resources hosted on a server. It is based on four principles with the ultimate purpose of ensuring stability and improving performances. *Adressability* and *Uniform interface* ensure that the resources can be read by client applications and facilitate combinations with resources hosted on other servers. *Statelessness* and *Connectedness* avoid client-server affinities and ensure the capacity to handle very large workloads. See Roy T. FIELDING, *Architectural Styles and the Design of Network-based Software Architectures*, University of California, Irvine, 2000. http://www.ics.uci.edu/~fielding/

API enabled external developers to integrate resources from a software platform into their applications. This marked the birth of cloud computing as a large-scale business model[130].

Application Programming Interfaces (API)[131]



Today, most major digital economy companies provide APIs that are accessible to all for free or for a fee. These APIs account for a more or less large share of their business models. In addition to Salesforce, examples of the most commonly used APIs on the market include those of Facebook and Twitter (that integrate the sharing functions with all applications), Amazon Web Services (the largest software platform for data hosting and processing), Google Maps (to integrate interactive maps into any application) or Expedia (for reserving hotel rooms or flights[132]).

For the businesses using them, APIs meet three main needs:

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130 Previously, cloud computing services offered by the precursors, Apple, Microsoft and SAP, were reserved for computer services companies deploying large systems on behalf of their biggest customers.

131 FABERNOVEL and WEBSHELL, "Six Reasons Why APIs Are Reshaping Your Business," 2 December 2012. http://fr.slideshare.net/

132 90% of Expedia's revenue is generated through an API, which is used by the Website http://www.voyages-sncf.com/, which is operated by a joint venture belonging to SNCF and Expedia. For more on APIs, see FABERNOVEL and WEBSHELL, "Six Reasons Why APIs Are Reshaping Your Business," 2 December 2012. http://fr.slideshare.net/

- Functional flexibility: A business first develops an API for its own purposes. The API documentation is updated and designed for use by developers. This documentation standardises the software resources belonging to one part of the company and the procedures for their use by the rest of the company. Companies like Salesforce or Amazon, with their large scale and highly technical core businesses, have structured their whole information systems in the form of APIs to make the functional bricks more independent from each other and to boost the different teams' innovation efforts[133]. APIs for internal use eventually open the system up to external developers by making it a *platform* that is available to *third-party developers*.
- Business development and market power: When an API is open to external developers, it can be used to move beyond the platform and create an ecosystem of applications. Many businesses, non-profits and individuals can then use the resources made available through the API and step up the design, development and marketing of a multitude of innovative applications. This creates three advantages for the entity operating the API: innovation by third parties makes it possible to deploy adequately segmented applications to a much broader market than the one that the company could reach on its own; the commercial success of applications developed using the API brings the company running the platform a share of the sales revenue and profits generated; and finally, the company's platform attracts other companies that might otherwise have developed stand-alone applications and could potentially have become dangerous competitors.
- Control: an API provides access to resources hosted on a server. Its purpose is to prevent, ban or control the duplication of these resources and their dissemination outside the company. An API is not just an access point, it is also a control point that can be used to delimit the resources exposed precisely, to protect industrial secrets, for example, and to ensure that they are used in compliance with the agreed terms and conditions. These terms and conditions may, for example, prohibit caching of data from the platform or their commercial use without a share of the revenue generated. Authorisation arrangements, tools for marking resources, security programs that are executed in real time or measurement of request volumes and quota use are used to control external developers' use of the resources at every step in real time.

2.1.1.2. Data storage and processing technologies

Non-relational databases constitute one of the most significant advances achieved with the emergence of "Web 2.0". Traditional *relational* databases organise data in tables that are linked by logical *relations* according to the principle of non-redundancy: to minimise storage volumes, the same data should not be stored in more than one table in the database. But, with the advent a large systems serving hundreds of millions of users, these databases have run up against their limitations, which stem from rigid data models, long computation times because of the joins between data tables, and an inability to handle very large volumes of data. Non-relational databases, also called "NoSQL" databases[134], overcome these problems and have revolutionised data management by breaking free from the principle of non-redundancy. They meet the requirements of major Web 2.0 applications and put the priority on performance and workload. The offer four advantages[135]:

[133] Jeffrey P. BEZOS (Founder and CEO, Amazon.com, Inc.), *Letter to Shareholders*, 2010. http://www.sec.gov/

[134] The SQL language is used to append and query relational databases. Non-relational databases are called "NoSQL" ("Not only SQL) to signify the reversal of the reasoning behind their design.

[135] Guy HARRISON, "10 things you should know about NoSQL databases," *Tech Republic*, 26 August 2010. http://www.techrepublic.com/

- Computing power can easily be increased by using many parallel low-cost commodity servers, which ends reliance on more powerful and more sophisticated stand-alone database servers and increases the capacity to handle a larger read and write request load at a reasonable cost.
- They do not require as intensive and expensive database administration resources as relational databases. This characteristic, like the previous one, diminishes running costs and enhances returns to scale.
- They allow greater flexibility in defining and modifying data models, which allows for greater functional flexibility in the applications relying on these technologies. Rapid functional iterations are a decisive factor for building user loyalty in the digital economy.
- Finally, they can store and process much greater volumes of data generated by the activity of users of the major digital economy applications, which is growing exponentially[136].

Furthermore, the big data processing algorithms make data processing in Web 2.0 volumes possible. For example, MapReduce is a programming model for processing big data volumes. It is used for processing that consumes resources distributed over a huge number of machines running in parallel. Different MapReduce implementations can be found on the market: Google holds the patent for MapReduce and is offering its own implementation on the Google App Engine software platform, which is one component of its cloud computing business; Amazon also offers a cloud computing implementation of MapReduce with Amazon Elastic MapReduce; Hadoop is an open source distribution that implements the MapReduce algorithm, which comes from the Apache Software Foundation. MapReduce is one of many examples of algorithmic innovations made necessary by the increase in the size of databases and introductions of non-relational databases. It also shows how, with the development and growing numbers of software platforms, more and more computer programs run in the cloud, on "distributed" architectures that are much more "scalable" instead of on companies' own internal servers.

2.1.1.3. Technologies for improving user experiences

The response time of an application is a critical factor in a digital economy, where abundant supply and volatile demand require applications to optimise their performances to achieve near real-time response times. Various technologies have been developed recently to improve response times:

- Some of them relate to programming methods: Asynchronous programming consists of facilitating the execution of the various tasks in a program independently of each other, with no sequential blocking, so that execution can continue, even when some processes are still awaiting transmission. *Node.js* is one example of an asynchronous programming engine written in Javascript that has become increasingly common in the open source community, with the recent involvement of Microsoft[137].
- On other fronts, cache management technologies, such as *Redis*[138], a database management system that uses RAM to avoid costly disk access, or content delivery networks (CDNs), which are infrastructure services that optimise the location of

[136] *"The information accessible in digital formats increased from 193 petabytes in 1996, which is the equivalent of all books printed by humanity up to that point, to 2.7 zetabytes, which is one million times more, in 2012."* See Henri VERDIER, "Les *Big Data* de A à Z," *ParisTech Review*, 26 November 2012. http://www.paristechreview.com/

[137] Mary Jo FOLEY, "Microsoft, Joyent deliver 'first stable build' of Node.js on Windows," *ZDNet*, 8 November 2011. http://www.zdnet.com/

[138] http://redis.io/

resources in data centres near users, testify to the efforts made to reduce response times and make the user experience more pleasant and more fluid. This is the price that has to be paid to maintain the quality of relationships with users.

Design has been another area to see considerable progress Design is rarely seen as a crucial discipline in the digital economy because of its lower technology-intensiveness. However, it plays a decisive role in the user experience and is thus a critical factor in the competition between companies seeking to become the users' preferred point of contact. Research in the "*persuasive sciences*[139]" has highlighted the impact that subtle changes in the graphical and functional design can have on users' behaviour. Consequently, the design of user experiences and interfaces is a major issue in the digital economy. There are two especially important dimensions to this:

- At a time when the nature and format of devices is constantly diversifying, one design challenge is to adapt applications to the screens and commands of all Internet access devices dynamically. The HTML 5 language was developed to adapt the interface code to functions that differ from one device to another (touch screens or non-touch screens). This makes a "*responsive design*[140]" approach possible.
- With the abundance of data and the development of "*growth hacking*[141]", design has also become an increasingly statistical and technological discipline. The appearance of a page is changed dynamically depending on the device used, on the mix of resources from several servers, on the comparison of the performances of several different versions of the same appearance or the same function (*A/B testing*[142]) or, more simply, on the users' behaviour.

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Sometimes, all of these technologies seem to involve pure research, or their technicality may make them seem intimidating. In fact, they are already present in all of the applications we are familiar with in our day-to-day Internet use[143] in three different ways:

- All of the major digital economy companies use these technologies to power their applications. These technologies have allowed such companies to live up to some excessively ambitious service commitments, such as connecting one billion Facebook users or Google's organisation of the world's information. They also underpin such companies' innovation efforts by enabling them to collect massive volumes of data.
- Smaller companies use the same technologies, relying on the software platforms operated by the large companies as a general rule, with a minimum-billing model that Amazon Web Services imposed at the time, when it was the precursor in the market. Under this model, there was no charge for resources up to a certain volume, and variable charges according to usage after that. The charges were very low since the growing numbers of applications on the platform generated high returns to scale.

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139 B.J. FOGG (Professor at Stanford University), *Persuasive Technology: Using Computers to Change What We Think and Do*, Morgan Kaufmann, 2002.

140 Pete CASHMORE, "Why 2013 is the Year of Responsive Web Design," *Mashable*, 11 December 2012. http://mashable.com/

141 Mattan GRIFFEL, "Growth Hacking: Lean Marketing for Startups," 22 October 2012. Dave MCCLURE, "Startup Metrics For Pirates," November 2012. http://fr.slideshare.net/

142 Mark WILSON, "How A/B Testing Could Change Online Gaming Forever," *Fast Company*, 22 August 2012. http://www.fastcodesign.com/

143 Barack OBAMA'S presidential campaign was the latest example of large-scale use of a range of technologies related to big data. See Sean GALLAGHER, "Built to win: Deep inside Obama's campaign tech," *Ars Technica*, 14 November 2012. http://arstechnica.com/

- Finally, most of these technologies are not proprietary. They were produced by communities of free software developers. Most of them are accessible to everyone free of charge and fully documented. They are constantly being improved by the joint efforts of developers committed to an on-going process of mutual assistance and collaboration. Even the major technology companies have participated in the free software movement, either by underwriting the initial development (as Google did for the MapReduce algorithm), or by adopting a free software technology and then playing a driving role in its development (as Microsoft did for the Node.js framework[144]). For major companies, joining a community of developers is a decisive factor for launching and developing an innovation ecosystem.

The consequences of the advent of these technologies is clear: it has become easier and easier and cheaper and cheaper to collect data and to leverage them in the very competitive markets of the digital economy. These are the Big Data technologies that are gradually placing data at the heart of value creation in the digital economy and making data the common denominator of all digital economy business models.

2.1.2. The data that enrich the digital economy are increasingly generated by users

Data, and more specifically, personal data, are at the heart of all digital economy business models. Each model differs as to how these data are collected and processed. But all of the models leverage data to improve their products and services, generate productivity gains, diversify their business or strengthen their positions on the different sides of their business models. There are several ways to describe and qualify the use of data in this context.

2.1.2.1. Qualifying data by collection method

In the digital economy, every action leaves a trail by default. Unlike customer loyalty cards or contests, there is no need to provide users with an incentive to share data by offering discounts or chances to win prizes. Only certain constraints prevent data from being collected at every step in the use of an application. There are always physical constraints, related to data storage and analysis capacities, legal constraints related to the limits of the consent granted by users and compliance with the new principle of proportionality, which states that it is improper to collect data that are not necessary for the purposes of operating a service[145].

Companies use three categories of personal data[146]:

- Collected data are gathered by tracking the use of an application (browsing, clicks, pages visited, chains of characters entered). All of this information can be date-and-time-stamped and attributed to a specific location. There are two distinct situations. If the user is identified, the data are personal and the users' consent is needed to collect them. If the user is not identified and cannot be identified indirectly, then the data are not personal and, as the law currently stands, the users' consent is not needed.

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144 Matthew BAXTER-REYNOLDS, "Here's why you should be happy that Microsoft is embracing Node.js," *The Guardian*, 9 November 2011. http://www.guardian.co.uk/

145 The principal of proportionality currently being discussed at the European Union level comes from the Proposal for a Regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and the free movement of such data (General Data Protection Regulation) SEC (2012) 72 final.

146 WORLD ECONOMIC FORUM, in collaboration with BAIN & COMPANY, *Personal Data: The Emergence of a New Asset Class*, January 2011. http://www.bain.com/

- Submitted data are provided by the user, who specifically enters data for various reasons:
  - Use of an application requires users to submit data, for example, users enter a chain of characters to query a search engine.
  - The specific purpose of the application is to post contributions from users, either for the general public or for certain other users, such as friends on Facebook or followers on Twitter. The application may rely on contributions from other users, such as Wikipedia or applications like Waze, a social navigation and traffic application that does not use a map or GPS and relies solely on data submitted by other users[147].
- Finally, inferred data are data inferred by processing, and, in particular, by aggregating personal data relating to a company's users and customers. There are four distinct approaches:
  - Data are matched with personal data from other users for the purposes of comparison or to apply collaborative filtering algorithms[148].
  - Data are matched with other data from the company's information system, such as operating data or financial data.
  - Data are matched with data from third parties that have received licenses on a commercial basis or free of charge.
  - Data are matched with public data from the Internet, obtained by using webcrawling techniques and other methods.

2.1.2.2. Qualifying data by the ultimate purpose of the processing

A second way to describe and qualify the commercial use of data is to describe the processing used and its ultimate purpose:

- Data collected from regular and systematic monitoring of users' activity can be used to measure and improve the performances of an application and to manage key indicators through well-chosen and targeted adjustments and improvements. This approach is called "*growth hacking*" and is similar to performance-based management. It requires the collection of abundant data, which are often restructured in near real time to facilitate analysis using various tools available on the market or developed in-house[149].

  One particular form of growth hacking is "*A/B testing*", which consists of proposing a design variant to a group of users and measuring differences in performance compared to a control group[150]. Data generated by users' activities are also analysed statistically to identify the interface that maximises the acquisition of new visitors, the conversion of mere visitors into identified users, the interactions between users and the use of these interactions in peer-to-peer recommendation strategies, and the value of the average shopping cart in sales applications[151]. Facebook, for example, engages in large-

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147 Leena RAO, "Social Navigation And Traffic App Waze Raises $30M From Kleiner Perkins And Li Ka-shing," *Techcrunch*, 18 October 2011. http://techcrunch.com/

148 *"Collaborative filtering covers a set of methods for building recommendation systems that use the opinions and rankings of a group to aid individuals"*. http://fr.wikipedia.org/

149 Mattan GRIFFEL, "Growth Hacking: Lean Marketing for Startups," 22 October 2012. Dave MCCLURE, "Startup Metrics For Pirates," November 2012. http://fr.slideshare.net/

150 *"The data revolution has turned customers into unwitting business consultants, as our purchases and searches are tracked to improve everything from websites to delivery routes,"* Erik BRYNJOLFSSON and Andrew MCAFEE, "The Big Data Boom Is the Innovation Story of Our Time," *The Atlantic*, 21 November 2011. http://www.theatlantic.com/

151 Along the same lines, during the 2012 American presidential campaign, a series of 240 successive A/B tests helped to increase the donation conversion rate for visitors to the fundraising page for Barak OBAMA's campaign

scale A/B testing and always has several versions of its application running at the same time in order to measure their relative performances and inspire changes to its design[152].

- User-generated data can be used to customise the services provided. Consideration of the user's personality makes it possible to make the right recommendations, to spare the user certain steps, to show the user the right advertisements[153] and, increasingly, to propose a price to the user that has been determined by elasticity calculations and coincides exactly with the user's willingness to pay[154], which, in microeconomic terms, has the effect of maximising the seller's surplus and cancelling out the consumer's surplus. For several years now, Google's PageRank algorithm provides customised search results based on the history of the user's previous searches, which reveal the user's interests and the way the user's queries are worded.
- Data generated by one user can be used to provide better service to other users, either by presenting them directly, as in the case of consumers' comments in retail sales applications, or they can be used for collaborative filtering in order to make recommendations to another user with similar characteristics, based on a user's behaviour. This is how Amazon has built up its recommendation engine, which generates a significant share of its sales.
- Half-way between performance improvements and service customisation, learning algorithms based on user-generated data are used to customise and further automate services after a period in which the application learns to know the user better and anticipate the user's needs. The voice-recognition interface, Siri[155], which is built into the most recent Apple mobile devices, and the Nest smart thermostats[156], incorporate learning algorithms that are used to adapt these applications gradually to the user's diction and daily habits.
- User-generated data from one application can be used to improve the service rendered in another application. For example, Google stated to incorporate the text and interactions from its social application Google+ into the results of its PageRank search algorithm[157].
- Data from an application may be sold to third parties by granting a license to use the data, subject to the limits of the consent granted by the user. This is the business model for a company like Bazaarvoice[158], which collects consumer comments about products and licenses them to merchants who carry those products.

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and meant that the campaign Website alone raised more than 250 million dollars out of a total of more than one billion dollars. See Kyle RUSH, "Meet the Obama campaign's $250 million fundraising platform," 27 November 2012. http://kylerush.net/

[152] Reena JANA, "Facebook's Design Strategy: A Status Update, Behind the scenes with the team that's redefining human connection," *Design Mind*, No. 14. http://designmind.frogdesign.com/

[153] Advertising is customised for optimisation purposes, but also to help users by showing them an advertisement that is more in line with their needs and thus less intrusive, and even letting the user choose between different advertisements. This is what the Hulu application (Internet television) does. Hulu has been a pioneer of advertising choice. See Jean-Paul COLACO (*Senior Vice-President of Advertising*), "The Power of Choice in Advertising," *Hulu Blog*, 3 October 2011. http://blog.hulu.com/

[154] Stephanie CLIFFORD, "Shopper Alert: Price May Drop for You Alone," *The New York Times*, 9 August 2012. http://www.nytimes.com/

[155] Erik KAIN, "Apple's Siri and the Future of Artificial Intelligence," *Forbes*, 15 October 2011. http://www.forbes.com/

[156] Sarah KESSLER, "Nest: The Story Behind the World's Most Beautiful Thermostat," *Mashable*, 15 December 2011. http://mashable.com/

[157] Keith KAPLAN, "How Google's +1 Button Affects SEO," *Mashable*, 21 February 2012. http://mashable.com/

[158] Leena RAO, "Customer Reviews And Social Commerce Platform Bazaarvoice Files For $86M IPO," *Techcrunch*, 26 August 2011. http://techcrunch.com/

One way to make money from these data is to make them available on a software platform. In this case, third-party developers may use the data collected by the platform operator's own applications, subject the general terms and conditions of use. Data may be made available on a platform in the form of a flow of aggregated data or in the form of a flow of personal data, subject to the users' consent. For example, the Facebook platform uses the Open Graph protocol[159] and the Facebook Connect[160] arrangement to enable users to identify themselves in other applications and to access their data collected by Facebook, especially data regarding their marital status, their photos, their networks of friends or their interests.

2.1.2.3. Qualifying data according to the intensity of their collection and the nature of the service

A third criterion for distinguishing between data collection practices is intensity. This can be assessed with regard to the user experience. If this experience gives rise to data collection at every step and from every angle, then the monitoring of the user's activity can be qualified as "regular and systematic", in accordance with the terminology used in the recent proposal for a European Regulation on the protection of personal data[161]. On the contrary, if data are collected only at certain stages of the user experience, monitoring of the users' activity cannot be qualified as regular and systematic. In the case of anonymous sessions, where the user is not explicitly identified, user data from different sessions cannot be connected and it is impossible to conclude that they relate to the same person. Once again monitoring intensity is weaker than in the case of user who is explicitly authenticated for each session.

Netflix recently explained the difference in the monitoring of its clients in its two businesses: DVD rentals through the mail and online streaming of films and shows. As Netflix explains on its blog[162], its sophisticated recommendation algorithm is no longer a critical issue for the company, since its primary business is streaming videos, rather than sending DVD through the mail: *"streaming members are looking for something great to watch right now; they can sample a few videos before settling on one, they can consume several in one session, and we can observe viewing statistics such as whether a video was watched fully or only partially."*[163]: the wealth of data collected makes it possible to improve the quality of the recommendations without requiring a more sophisticated algorithm. In other words, *the algorithmic intensity of the service rendered is inversely proportional to the intensity of data collection.*

As a general rule, the Internet makes regular and systematic monitoring of user activity the default practice. The added value of an online application, compared to software executed on an offline device, or even a non-software service, such as DVD rentals, is

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[159] Samuel AXON, "Facebook's Open Graph Personalizes the Web," *Mashable*, 21 April 2010. http://mashable.com/

[160] Michael ARRINGTON, "Facebook Responds To MySpace With Facebook Connect," *Techcrunch*, 9 May 2008. http://techcrunch.com/

[161] Proposal for a Regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and the free movement of such data (General Data Protection Regulation) SEC (2012) 72 final.

[162] Xavier AMATRIAIN and Justin BASILICO, "Netflix Recommendations: Beyond the 5 stars (Part 1)," *The Netflix Tech Blog*, 6 April 2012. http://techblog.netflix.com/

[163] Casey JOHNSTON, "Netflix never used its $1 million algorithm due to engineering costs," *Ars Technica*, 13 April 2012. http://arstechnica.com/

precisely that it makes it possible to monitor user activity in real-time and in great detail[164], subject, of course, to the users' consent.

2.1.3. All of the major ecosystems are being built around the use of data

The main digital economy firms have reached very large scales by leveraging the data generated by their users compared to competitors that do not implement such a strategy[165] and, with the notable exception of Amazon[166], they operate with high margins.

- Amazon collects users' comments and ratings and tracks users' actions (searches, page views, purchases) to enrich the critical software used to operate its online services: product recommendations, customer interest predictions, optimisation of the order in which products are displayed in response to customers' search queries and "*product data ingestion and categorisation, demand forecasting, inventory allocation and fraud detection*"[167]. Amazon's Kindle and Kindle Fire devices are even used to store users' underlinings and annotations of passages in digital books, which will enable Amazon to qualify the content better and, later on, to approach readers on the basis of their annotations in a specific book[168]. On the whole, the data generated by Amazon's customers are used to improve service and sell customers products at lower prices. But they have also been used to generate sales to other customers through the recommendation engine and, more recently, to target advertising for users at every step in the process.
- Google and its search engine use user-generated data in several ways: to index and organise Web content, according to hyperlinks analysed using Markov chains and semantic page analysis[169], to propose wording of queries that suit the PageRank[170] algorithm, to influence the results of this algorithm through Google+ and to generate revenue from clicks on sponsored links from the AdWords system. Google also uses data in its other applications. It uses data in its Chrome Web browser to analyse the use

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[164] For more on this subject, see Jessica LIVINGSTON, "Philip Greenspun, Founder of ArsDigita," *Founders at Work: Stories of Startups' Early Days*, Apress, 2008.

[165] Emmanuel TORREGANO, "Google, Apple, Amazon, ce sont « les trois sœurs »," *Electron libre*, 2 March 2012. http://www.electronlibre.info/

[166] In an interview with *Wired* Magazine, Jeff BEZOS, CEO of Amazon, stated, "*We're a company very accustomed to operating at low margins. We grew up that way. We've never had the luxury of high margins, there's no reason to get used to it now. We were determined to build the best services but to price them at a level that customers couldn't match, even if they were willing to use inferior products. Tech companies always have high margins, except for Amazon. We're the only tech company with low margins.*" Steven LEVY, "Jeff Bezos Owns the Web in More Ways than you Think," *Wired*, 13 November 2011. http://www.wired.com/

[167] Jeffrey P. BEZOS, Founder and CEO, Amazon.com, Inc., *Letter to Shareholders*, 2010. http://www.sec.gov/

[168] THE NETWORK THINKERS, "The Next Big Thing," 14 April 2012. http://www.thenetworkthinkers.com/

[169] As noted by Nicholas G. CARR, *"At the heart of [Google] is the PageRank algorithm that Brin and Page wrote while they were graduate students at Stanford in the 1990. They saw that every time a person with a Web site links to another site, he is expressing a judgment. He is declaring that he considers the other site important. They further realized that while every link on the Web contains a little bit of human intelligence, all the links combined contain a great deal of intelligence – far more, in fact, that any individual mind could possibly possess. Google's search engine mines that intelligence, link by link, and uses it to determine the importance of all the pages on the Web. The greater the number of links that lead to a site, the greater its value. As John Markoff puts it, Google's software 'systematically exploits human knowledge and decisions about what is significant'. Every time we write a link, or even click on one, we are feeding our intelligence into Google's system. We are making the machine a little smarter – and Brin, Page, and all of Google's shareholders a little richer."* See Nicholas G. CARR, *The Big Switch: Rewiring the World, from Edison to Google,* W.W. Norton, 2008.

[170] Frédéric KAPLAN, "La question de la langue à l'époque de Google," Ecole polytechnique fédérale de Lausanne, December 2012. http://fr.slideshare.net/

of the browser and to suggest query wordings[171]. It uses data in Google Translate to improve the performances of its translation engine[172]. It uses data in the Gmail e-mail system, with an automatic analysis of the content of messages to target the advertising presented to user, but also to customise search results[173]. It uses data in Google Maps to improve the accuracy of its maps and the directions given, but also to provide location-appropriate advertising on behalf of nearby businesses[174].

- Facebook, with a staff of barely more than 3,000, serves one billion users, whose activity generates the value added of its service. The spectacular valuation of Facebook when it was listed on the stock market, despite the ensuing controversy and decline in its share price, reflects the value that the market attributes to its user data[175], the connections between Facebook users[176] and the paid services that Facebook could build on this foundation in the future, particularly in payment services[177]. The abundant data that Facebook collects set it apart from other companies, such as online newspapers, that charge their customers money, but cannot collect as many data about them[178]. In the case of Facebook, the ultimate purpose of collecting and using data is to start and develop an ecosystem, rather than generate immediate revenue.
- Apple's strategy has been different. It focuses less on collecting data and more on making personal data from users' devices directly available to application developers, without having to store the data in the cloud. A user's contacts, photos and music playlists can be used by applications installed on the device, which warrants some of Apple's 30% cut of the application operators' potential sales revenue. Eventually, with the development of the iCloud platform, the same personal data will gradually migrate to the cloud, making Apple's platform model more like that of the other major digital economy companies.

2.1.4. The value of data is increasingly well documented by the market and market observers

As technology advances, the value of data is increasingly well documented by the market and market observers, such a research and consulting firms, academics, international organisations and specialised bloggers.

Notwithstanding the protection of personal data, the value of these data has been identified and even quantified by many publications:

- Many consulting firms have drafted documents that propose an assessment of the economic value of big data in general, and personal data in particular. In a report on Big

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171 Chris CONLEY, "Paying for Chrome with Personal Data," *American Civil Liberties Union of Northern California*, 6 October 2008. https://www.aclunc.org/

172 Tim ADAMS, "Can Google break the computer language barrier?" *The Guardian / The Observer*, 19 December 2010. http://www.guardian.co.uk/

173 Enid BURNS, "Google Feeds More Personal Data Into Search Trials," *Technology News*, 21 December 2012. http://www.technewsworld.com/

174 James BALL, "Google Maps: thanks for the app, here's my personal data," *The Guardian*, 13 December 2012. http://www.guardian.co.uk/

175 Somini SENGUPTA and Evelyn M. RUSLI, "Personal Data's Value? Facebook Is Set to Find Out," *The New York Times*, 31 January2012. http://www.nytimes.com/

176 Sarah LACY, "Why Silicon Valley and Wall Street See Facebook So Differently," *Pando Daily*, 14 September 2012. http://pandodaily.com/

177 Matt ROSOFF, "Facebook Has A HUGE Opportunity That People Are Ignoring," *Business Insider*, 27 March 2012. http://www.businessinsider.com/

178 Frédéric FILLOUX, "Strange Facebook Economics," *Monday Note*, 5 February 2012. http://www.mondaynote.com/

Data[179], the McKinsey Global Institute estimates the value that could be created by Big Data at 300 billion dollars in the health sector in the United States and at 250 billion euros in the general government sector in Europe. The same report estimates the total consumer surplus that Big Data could generate at 600 billion dollars. In a report commissioned by the World Economic Forum[180], Bain & Company points out that 50 billion devices and objects will be connected to the Internet by 2020 and that, consequently, the volume of personal data collected (the "*new oil*" for the economy) should increase forty times over the same period. The Boston Consulting Group[181] has estimated the value of voluntarily submitted personal data in the United Kingdom alone at 32 billion pounds in 2020. More recently, the same group calculated that the personal data collected from European consumers were worth 315 billion euros in 2011 and could generate value creation equal to 8% of European GDP by 2020[182].

- Much academic research has been done on the value of personal data and their use by public-sector and private-sector organisations. Examples include the research by Nicholas A. CHRISTASKIS, Professor of Medicine at Harvard University (Cambridge, Massachusetts), and James H. FOWLER, professor of sociology at the University of California (San Diego), on the influence that social networks have on individuals[183], or various other research into using an econometric approach to "price" personal data[184]. For the thirtieth anniversary of its Privacy Guidelines, the OECD commissioned a teacher and researcher at Carnegie-Mellon University in Pittsburgh (United States) to produce a study on the economics of personal data protection and how these data are used commercially[185]. A few months ago, France's General Commission on Investment made a call for Big Data projects as part of the Investments in the Future Programme, which has a budget of 25 million euros[186].
- Researchers have recently started work on measuring data and their value in statistics:

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[179] MCKINSEY GLOBAL INSTITUTE, *Big data: The next frontier for innovation, competition, and productivity*, May 2011. http://www.mckinsey.com/

[180] WORLD ECONOMIC FORUM, in collaboration with BAIN & COMPANY, *Personal Data: The Emergence of a New Asset Class*, January 2011. http://www.bain.com/

[181] WORLD ECONOMIC FORUM, in collaboration with BOSTON CONSULTING GROUP, *Rethinking Personal Data: Strengthening Trust*, May 2012. http://www.bcg.com/

[182] James FONTANELLA-KHAN, "Personal data value could reach €1tn," *The Financial Times*, 7 November 2012. http://www.ft.com/. The article deals with the report by cable operator LIBERTY GLOBAL, in collaboration with BOSTON CONSULTING GROUP, *The Value of our Digital Identity*, November 2012. http://www.lgi.com/

[183] Nicholas A. CHRISTASKIS and James H. FOWLER, *Connected, The Surprising Power of Our Social Networks and How They Shape Our Lives – How Your Friends' Friends' Friends Affect Everything You Feel, Think, and Do*, Back Bay Books, 2011.

[184] Chao LI, Daniel Yang LI, Gerome MIKLAU, Dan SUCIU, "A Theory of Pricing Private Data," Cornell University Library, 17 December 2012. http://arxiv.org/

[185] Alessandro ACQUISTI, "The Economics of Personal Data and the Economics of Privacy," *The Economics of Personal Data and Privacy: 30 years after the OECD Privacy Guidelines*, December 2010. http://www.oecd.org/

[186] "*The purpose of this call for projects, with a budget of 25 million euros, is to support R&D projects focusing on technologies linked to utilization of Big Data, along with one or two experimental platforms. The projects will address some of the main technological obstacles for Big Data with regard to processing architecture and software tools for handling large data flows and volumes. The projects will also aim to meet some of the major application challenges: using scientific and environmental data, business intelligence, multimedia content, open data, etc.*

The aim is to encourage companies to develop and integrate technologies and know-how so that an innovative Big Data ecosystem can emerge in France, and to promote the creation of innovative services that use these technologies.

With the growth of the Internet, social networks, mobile telephony, and connected communication devices, more information is now being produced than ever before. In 2010, companies stored additional data equivalent to 1.7 billion DVDs and the data stored by individuals are now more than ten times greater than the capacity of the largest libraries in the world. Utilisation of such massive amounts of data represents one of the main opportunities for developing innovative activities and value creation"

Cf. COMMISSARIAT GÉNÉRAL À L'INVESTISSEMENT, "Announcement of the call for Big Data projects," 22 March 2012. http://investissement-avenir.gouvernement.fr/

- Economic statistics do not track data consumption and investment in data. In a publication by the think tank, Progressive Policy Institute, Michael MANDEL points out that "*data is neither a good nor a service. Data is intangible, like a service, but can easily be stored and delivered far from its original production point, like a good. What's more, the statistical techniques that have been traditionally used to track goods and services don't work well for data-driven economic activities. The implication is that the key statistics watched by policymakers—economic growth, consumption, investment, and trade—dramatically understate the importance of data for the economy. In turn, these misleading statistics distort government policy.* Neither data consumption[187] nor data investment[188] is currently measured by statistics. Michael MANDEL proposes some possibilities for overcoming this omission[189].
- The fact that most online data are available for free makes it more difficult to measure the value added generated by the digital economy. As Erik BRYNJOLFSSON[190] observed, the share of "*digital goods*" measured in the American economy has strangely remained the same as in the nineteen-sixties, since it is measured solely by the charges paid to telephone operators and Internet access providers. Consequently, he proposes measuring the value of "*digital goods*" by the time that individuals spend consuming these goods and the surplus that this consumption generates for those individuals. He manages to calculate that the digital economy sector's value creation in the American economy as a whole stands at 300 billion dollars, rising by 40 billion dollars per year, and that individuals benefit directly from this value directly through the consumer surplus. This value is currently omitted from the measurement of gross domestic product (see figure below).

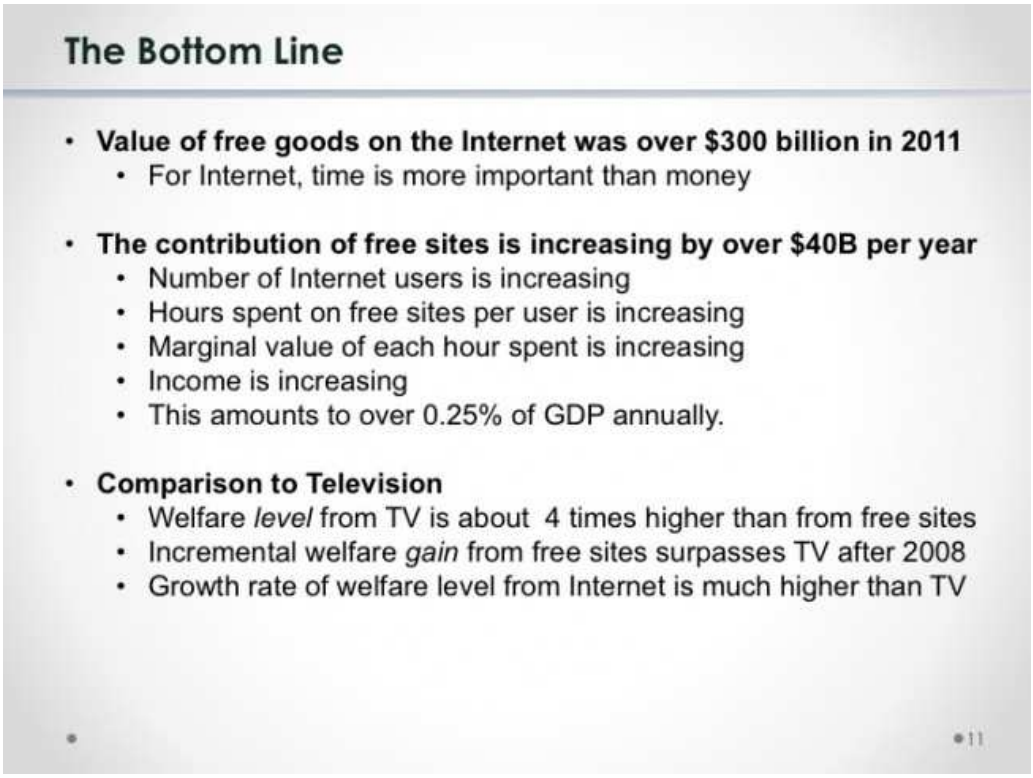
[187] Consumption of the data concerned takes different forms, including applications, e-mail messages, online games, maps and navigation data, search results, interactions between individuals, hosting, transmission over telecommunications networks, video and cultural content.

[188] Data investment can be identified, for example, in genome databases, economic and financial databases, social networking databases, transaction history databases, health and climate information databases.

[189] Michael MANDEL, "Beyond Goods and Services; The (Unmeasured) Rise of the Data-Driven Economy," *Progressive Policy Institute Policy Memo*, October 2012. http://www.progressivepolicy.org/

[190] Erik BRYNJOLFSSON, "Measuring the 'Attention Economy'," 19 September 2012. and "Techonomy 2012: Why it Matters that the GDP Ignores Free Goods," 7 December 2012, The MIT Center for Digital Business. http://digitalcommunity.mit.edu/

Valuing free "digital goods"[191]



- Digital economy professionals are starting to make the link, in France, between data value and taxation. Michel CALMEJANE, CEO of Colt Technology Services, thinks that "*data are the new oil*" of a "*forty-year-old economy*" where "*value creation is located at the place where the transaction cost is lowest*" and where "*tax strategies are an integral part of the unit cost*"[192]. Pierre BELLANGER, CEO of Skyrock talks of taxation based on the protection of individual freedoms that "*repatriates the unrequited share of value exported*" as an affirmation of digital sovereignty[193].
- And, last but not least, data and the value of data are also being debated in the media. Back in 2010, the authoritative weekly, *The Economist*, made "*The Data Deluge*" its cover story, along with businesses' efforts to make use of data[194]. More recently, Barack OBAMA's presidential campaign dramatically demonstrated the advantages to be gained from detailed and massive utilisation of data generated by regular and systematic monitoring of individuals, which have been described in many detailed and sometimes highly technical articles published in the American technical media[195], as well as the French mass-market media[196]. In France, Big Data are generally being discussed more

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191 Erik BRYNJOLFSSON, *ibid.*

192 Michel CALMEJANE, "Industrie numérique, fiscalité et *digital studies,*" 20 December 2012. http://fr.slideshare.net/

193 Pierre BELLANGER, "La liberté compétitive – Contribution à la mission d'expertise sur la fiscalité de l'économie numérique," 2 October 2012. http://www.skyrock.fm/bellanger/

194 "The Data Deluge," *The Economist*, 25 February 2010. http://www.economist.com/

195 Sasha ISSENBERG, "How President Obama's campaign used big data to rally individual voters," *Technology Review*, 19 December 2012. http://www.technologyreview.com/

196 For example, Philippe BERRY, "Election américaine: *«Big data»*, l'arme secrète d'Obama," *20 Minutes*, 8 November 2012. http://www.20minutes.fr/

and more outside expert circles on blogs and in the specialised and business press[197]. They have even been discussed on the editorial pages[198] and have even made the front page of the daily newspaper, *Le Monde*[199].

2.2. Most of the data used in the economy are generated by the "free labour" of the mass of application users

2.2.1. There is growing awareness of the application users' "free labour"

User-generated data are put back into the production chain in the digital economy, blurring the dividing line between production and consumption. Application users' activity and the data that it generates do minimise the prices that users pay[200], but they also generate a value for other users or customers on another side of the business model. The digital economy is different from the conventional economy because it has become a contributive economy, where application users' bottom-up contributions make them production and distribution auxiliaries. In many cases, the users' contribution is free or nearly free for the company, since digital economy business models are characterised by "scalability", meaning exponential returns to scale stemming from network effects and near zero marginal costs.

The abundance of this "free labour", or *users' contribution to production*, is an extension of the firm theory formulated by Ronald COASE[201] in 1937, who won the 1991 Nobel Prize for Economics. Companies are no longer restricted to a choice between *sub-contracting* to suppliers and *hiring* employees. In the digital economy, they have a third choice, which is to produce an application that inspires uses to engage in an activity that generates positive externalities in the form of data, which are then put back into the production chain without any monetary consideration for the users. This "free labour" explains some of the low marginal operating costs and explains the exponential returns to scale that are specific to the digital economy. When an application attains a large scale, it can even give rise to a platform, where the resources made available can be used to produce other applications and further increase returns to scale.

Users' "free labour" can be observed, and quantified in some cases, in the business models of the large digital economy companies.

- Google has dominated the search engine market by leveraging its users' activity through it AdWords system. Amazon has dominated the retail market by leveraging consumer comments and browsing and purchasing histories to recommend the right products to its customers and to make their shopping experience simple and fluid. Facebook has leveraged the day-to-day interactions in its users' social networks. Apple has capitalised on the investment in 700,000 mobile applications available in the App

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197 Daniel KAPLAN, "*Big Data*, grandes illusions ?" *Internet Actu*, 11 April 2012. http://www.internetactu.net/. Henri VERDIER, "Peut-on être contre les *Big Data* ?" 17 April 2012. http://www.henriverdier.com/. Philippe DEWOST, "Petites réflexions sur le *Big Data*," 1 July 2012. http://blog.dewost.com/. Gilles BABINET, "*Big Data*, gros enjeux," *Les Echos*, 20 July 2012. http://www.lesechos.fr/. Henri VERDIER, "Les *Big Data* de A à Z," *ParisTech Review*, 26 November 2012. http://www.paristechreview.com/.

198 Stéphane GRUMBACH and Stéphane FRENOT, "Les données puissance du future," *Le Monde*, 7 January 2013. http://www.lemonde.fr/

199 Sarah BELOUEZZANE and Cécile DUCOURTIEUX, "Vertigineux *Big Data*," *Le Monde*, 26 December 2012. http://www.lemonde.fr/

200 In a conventional consumer labour model, just like Ikea customers assembling furniture themselves in order to pay less.

201 Ronald COASE, "The Nature of the Firm," *Economica*, 1937.

Store at no cost to Apple. These applications were developed by third parties who incur all of the investment and operating risk.

- In addition to these special cases, it has been shown that users' "free labour" has enabled many companies to avoid hiring employees to create content, which is increasingly produced by volunteer contributors[202], or to provide customer support, which is handled by applications where customers help each other for free, rather than relying on the company[203]. The media now report that the notion *unsourcing* is overtaking outsourcing thanks to customers' contributions[204].
- "Free labour" was a feature of some business models before the digital revolution. Contests and games, Tupperware parties, advertising-financed media and reality television[205] are earlier examples of similar practices. But the digital revolution expanded this approach by taking it to a much larger scale and by extending it beyond advertising, marketing and the media into all dimensions of business. Relying on "free labour" is not only a marketing and communication strategy for strengthening links between a business and its customers. It has gradually become an overall strategy for enhancing a company's productivity, business development, diversification and competitiveness.

Digital economy professionals and thinkers have identified and extensively analysed the "free labour" phenomenon. But the notion has had a hard time making its way into academic research or, more importantly, into public policy and tax law. The fact is that no consensus has even been reached yet about what term should be used to refer to the phenomenon. On the contrary, there are several co-existing outlooks and terminologies, depending on very specific contexts and points of view:

- The earliest analyses of the phenomenon stem from management science. This work identified "free labour" either in practice or in research work. Eric VON HIPPEL, professor of innovation at the Sloan School of Management at MIT, looked at the role that consumers play in innovation[206] back in the nineteen-seventies. More recently, C.K. PRAHALAD and Venkat RAMASWAMY introduced the notion of "*co-creation*" in 2000. This notion attempts to qualify the value stemming from the special relationship that a company forges with its customers to move beyond transactions and co-opt the "*experience*" co-created by the customer[207]. The notion of co-creation is now a fundamental part of many digital economy companies' business models[208]. The same phenomenon was then observed and generalised by Henry CHESBROUGH under the name "*open innovation*[209]", which was a precursor to the platform economy analysed later by Dion HINCHCLIFFE[210], for example.

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[202] MacKenzie WEINGER, "Unpaid Huffington Post bloggers still unpaid," *Politico*, 12 December 2012. http://www.politico.com/

[203] BABBAGE, "Outsourcing is so last year: The future of customer support," *The Economist*, 11 May 2012. http://www.economist.com/

[204] BABBAGE, *Ibid.*

[205] Alexia EYCHENNE, "Téléréalité : jouer, c'est travailler ?" *L'Express*, 6 April 2012. http://www.lexpress.fr/

[206] Eric A. VON HIPPEL, "The Dominant Role of Users in the Scientific Instrument Innovation Process," *Research Policy 5*, No. 3, July 1976.

[207] C.K. PRAHALAD and Venkat RAMASWAMY, "Co-Opting Customer Competence," *Harvard Business Review*, January-February 2000. http://hbr.org/

[208] EYEKA, "Online Co-Creation to Accelerate Marketing & Innovation," 3 May 2012. http://fr.slideshare.net/

[209] Henry CHESBROUGH, *Open Innovation: The New Imperative for Creating and Profiting from Technology*, HBS Press, 2003.

[210] Dion HINCHCLIFFE, "This Year's Ten Digital Strategies for the Next-Generation Enterprise," 29 May 2012. http://dionhinchcliffe.com/

- A second dimension of the discussion of "free labour" was inspired by the spectacular success of the free online encyclopaedia Wikipedia. Contributions from millions of users working in a non-profit structure have produced the largest encyclopaedia ever written and published in some languages that have never had an encyclopaedia before, and all this with a smaller number of errors per article than the *Encyclopaedia Britannica*[211]. The success of Wikipedia holds two particularly helpful lessons. *Intellectual value added* from collaborative work has been investigated by James SUROWIECKI, for example, around the notion of the "*wisdom of crowds*"[212]. *Industrial value added* created by dividing tasks between large numbers of individuals has given rise to the concept of *crowdsourcing*, a term coined by journalist Jeff HOWE[213], also called "*massively distributed collaboration*" by the entrepreneur Mitch KAPPOR[214]. This concept prefigured the rise of crowdsourcing services such as the Mechanical Turk[215], developed by Amazon, or one-off experiments, such as the mobilisation of Guardian readers to analyse the contents of MPs' expenses[216].
- With the advent of major content hosting platforms came the new phenomenon of users as content creators, alongside cultural industry and media professionals, which led to disruption of business models in these sectors. Journalists and artists on YouTube and blogging platforms are now competing with users who create and post their own content for free. This phenomenon has given rise to the concepts of "*user-created content*" or "*user-generated content*[217]", and "*content curation*[218]" by users. These concepts have been analysed by such observers as Clay SHIRKY from the media community, who speaks of the "*cognitive surplus*[219]" generated by the unsolicited and voluntary activity of hundreds of millions of online contributors.
- Around the same time, in a lecture and a follow-up article that has become famous and widely discussed, the publisher, author and conference organiser, Tim O'REILLY, forged the new more unified concept of "*Web 2.0*[220]". At the time, the renaissance[221] of the digital economy, a few years after the "tech bubble" burst in 2001, inspired the search for new analytical grids and brought about a new awareness of the importance of peer-to-peer processes in the digital economy. The visionary *Cluetrain Manifesto*[222]

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211 J. GILES, "Internet encyclopaedias go head to head." *Nature*, 2005.

212 James SUROWIECKI, *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*, Doubleday, 2005.

213 Jeff HOWE, "The Rise of Crowdsourcing," *Wired*, 14 June 2006. http://www.wired.com/

214 Mitch KAPPOR, "Content Creation By Massively Distributed Collaboration," *UC Berkeley School of Information*, 9 November 2005. http://www.ischool.berkeley.edu/

215 Scott KIRSNER, "My life as a micro-laborer: Exploring Mechanical Turk, Skyword, TaskRabbit, GrabCAD and more," *Boston.com*, 1 April 2012. http://www.boston.com/

216 Charles ARTHUR, "The breakneck race to build an application to crowdsource MPs' expenses," *The Guardian*, 18 June 2009. http://www.guardian.co.uk/

217 The OECD has discussed and analysed the notion of *user-generated content.* See OECD, WORKING PARTY ON THE INFORMATION ECONOMY, *Participative Web: User-Created Content*, 12 April 2007. http://www.oecd.org/internet/interneteconomy/

218 Pete CASHMORE, "Humans vs. automated search: Why people power is cool again," *CNN*, 13 January 2011. http://edition.cnn.com

219 Clay SHIRKY, *Cognitive Surplus: Creativity and Generosity in a Connected Age*, Penguin Group, 2010.

220 Tim O'REILLY, "What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software," *O'Reilly Media*, 30 September 2005. http://oreilly.com/

221 Sarah LACY, *Once You're Lucky, Twice You're Good: The Rebirth of Silicon Valley and the rise of web 2.0,* Gotham, May 2008. See Dylan TWENEY, "Review: Once You're Lucky, Twice You're Good," *Wired*, 15 May 2008. http://www.wired.com/

222 Le *Cluetrain Manifesto* was written by Chris LOCKE, Doc SEARLS, David WEINBERGER and Rick LEVINE in 1999 to defend the idea of an Internet that is a factor for sweeping changes in the economy created by power of interactions between individuals: *"A powerful global conversation has begun. Through the Internet, people are*

announced the advent of peer-to-peer back in 1999. After being prefigured by peer-to-peer file sharing services like Napster, peer-to-peer became prominent with the arrival of major applications for user interactions, such as MySpace and then Facebook, which radically challenged the overly simplistic view of the Internet as merely a medium or a distribution channel[223]. In 2008, Barak OBAMA's first presidential campaign increased the general public's and business community's awareness of the importance of peer-to-peer interactions in value creation[224].

- As the notion of "Web 2.0" matured, qualifying "free labour" became a more markedly scientific concern. Researchers in various disciplines have started to investigate the growth of "free labour": such as the "*extroverted firm*[225]" for Erik BRYNJOLFSSON[226], professor at the Sloan School of Management at MIT, or "*cognitive capitalism*[227]" and "*pollination*[228]" for Yann MOULIER BOUTANG, professor at the Technological University of Compiègne, who approaches taxation issues from this angle[229]. Yochai BENKLER, professor at the Harvard Law School, proposes the notions of "*co-production*", "*peer production*" and "*social production*"[230]. Bernard STIEGLER, philosopher and manager of the Centre Pompidou Research and Innovation Institute[231], speaks of a "contributive economy" gradually replacing the "consumer economy" from before the digital revolution[232].
- In the same vein, academics and authors specialising in strategy, management and innovation have proposed various unified concepts: *"lateral power*" and "*third*

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discovering and inventing new ways to share relevant knowledge with blinding speed. As a direct result, markets are getting smarter—and getting smarter faster than most companies." See Chris LOCKE, Doc SEARLS, David WEINBERGER and Rick LEVINE, *The Cluetrain Manifesto,* Basic Books; Anniversary Edition, 2011. http://www.cluetrain.com/. French translation: Chris LOCKE, Doc SEARLS, David WEINBERGER et Rick LEVINE, *Liberté pour le Net, Le manifeste Cluetrain : la fin du train-train des affaires,* Village Mondial, 2001. See also Simon OWENS, "'Cluetrain Manifesto' Still Relevant 10 Years Later," *PBS Mediashift*, 27 March 2009. http://www.pbs.org/mediashift/.

223 See also Francis PISANI and Dominique PIOTET, *Comment le Web change le monde : des internautes aux webacteurs*, Pearson Village Mondial, 2011.

224 Rahaf ARFOUSH, *Yes We Did: An Inside Look At How Social Media Built the Obama Brand*, New Riders, 2009.

225 Prasanna TAMBE, Lorin M. HITT and Erik BRYNJOLFSSON, "The Extroverted Firm: How External Information Practices Affect Innovation and Productivity," to be published in *Management Science*, draft from 2011. http://ebusiness.mit.edu/erik/

226 Who also co-authored Erik BRYNJOLFSSON and Andrew MCAFEE, *Race Against The Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy*, Digital Frontier Press, 2011. http://raceagainstthemachine.com/

227 Yann MOULIER BOUTANG, *Le capitalisme cognitif : la nouvelle grande transformation*, Editions Amsterdam, 2007.

228 *"It started with the information economy and it is continuing with the digital economy, especially with the mechanisms for capturing human pollination, meaning complex interactions between people. This is exactly what Google is doing. In economics, we generally ask how much something is worth. The world's bees produce the equivalent of one billion dollars in honey and wax. At the same time, they are also responsible year in and year out for approximately one third of all agricultural output, or the equivalent of 790 billion dollars. The ratio is 1 to 790."* See Yann MOULIER BOUTANG, *L'Abeille et l'économiste*, Carnets Nord, 2010. See also Yann MOULIER BOUTANG, interviewed by Jean-Marie DURAND, "La bifurcation historique du capitalisme est en train de s'opérer," *Les Inrockuptibles*, 22 May 2010. http://www.lesinrocks.fr/

229 Yann MOULIER BOUTANG, "Transformation de la valeur économique, de son appropriation et de l'impôt" *in* T. BERNS, J.-C. DUPONT and M. XIFARAS (éd.), *Philosophie de l'impôt*, Bruylant, 2006.

230 Yochai BENKLER, *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, Yale University Press, 2010. Download for free from http://www.benkler.org/. French translation: Yochai BENKLER, *La Richesse des réseaux : marchés et libertés à l'heure du partage social*, PUL, 2009.

231 The aim of the Institute is to "*anticipate, support and analyse changes in cultural practices made possible by digital technologies, and to contribute to helping them emerge in some cases*." http://www.iri.centrepompidou.fr/

232 Catherine PORTEVIN, "Bernard Stiegler : 'Il y a beaucoup d'inventions qui ne produisent aucune innovation'," *Télérama*, 6 June 2006. http://www.telerama.fr/

industrial revolution" for Jeremy RIFKIN[233], "*wikinomics*" for Don TAPSCOTT and Anthony D. WILLIAMS[234], "*distributed capitalism*" for Shoshana ZUBOFF[235], "*new capitalism*" for Umair HAQUE[236]or the "*age of the multitude*" for Nicolas COLIN (co-author of this report) and Henri VERDIER[237].

- Finally, critical theory has found an audience on both sides of the Atlantic and highlighted the dimension of exploitation or predation underlying the idea of "free labour"[238]. This is "*putting the whole individual to work*" for André GORZ[239], "*intangible work producing social relationships and affects*" for Antonio NEGRI[240], "*pronetariat*" for Joël DE ROSNAY[241], "*cognitive rent*" for Matteo PASQUINELLI[242], "*digital labour*" for Trebor SCHOLTZ[243].

The importance of "free labour" is consistent with the crucial determinants of success for digital economy companies, especially design, which makes it possible to forge a link with users, and the business model that makes money from this "free labour". The point for such companies is provide users with a fluid, reassuring and stimulating experience that makes it possible to infiltrate the day-to-day activities and even the private life of individuals. Within these private lives, another challenge is to forge a relationship with users that is deliberately placed in a non-commercial sphere, which inspires the user to engage in unsolicited activity that does not require monetary compensation, for reasons that vary, depending on the applications and the users[244].

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The discussion of "free labour" has become particularly crucial since the disruptions caused by the digital economy are gradually extending to all sectors of the economy, including the manufacturing industry[245], with Internet objects and robotics. The tax dimension of the discussion is obvious: today, companies that use the "free labour" of their

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233 Jeremy RIFKIN, *The Third Industrial Revolution: How Lateral Power Is Transforming Energy, the Economy, and the World*, Palgrave Macmillan, 2013. French translation: Jeremy RIFKIN, *La troisième révolution industrielle : comment le pouvoir latéral va transformer l'énergie, l'économie et le monde*, Les Liens qui Libèrent, 2012. http://www.thethirdindustrialrevolution.com/

234 Don TAPSCOTT and Anthony D. WILLIAMS, *Wikinomics: How Mass Collaboration Changes Everything*, Portfolio, December 2006. http://www.wikinomics.com/

235 Shoshana ZUBOFF, "Creating value in the age of distributed capitalism," *McKinsey Quarterly*, September 2010. http://www.mckinseyquarterly.com/

236 Umair HAQUE, *The New Capitalist Manifesto: Building a Disruptively Better Business*, Harvard Business Review Press, 2011. http://blogs.hbr.org/haque/

237 Nicolas COLIN and Henri VERDIER, *L'Âge de la multitude, Entreprendre et gouverner après la révolution numérique*, Armand Colin, 2012. http://age-de-la-multitude.com/

238 These theories were prefigured by radical criticism of advertising in general, e.g. Dallas Walker Smythe and the notion of "*audience commodity*". See Eileen R. MEEHAN, "Audience Commodity," *The International Encyclopedia of Communication*, Wolfgang DONSBACH, 2008. http://www.communicationencyclopedia.com/. See also the discussion of the notion of "*audience buying*" used by online advertising professionals: David KAPLAN, "For Turner Digital, Audience Buying Risk Outweighs Reward," *Ad Exchanger*, 9 October 2012. http://www.adexchanger.com/

239 André GORZ, *L'immatériel, Connaissance, valeur et capital*, Galilée, 2003, p. 29.

240 Antonio NEGRI, *Traversées de l'Empire*, L'Herne, 2010. See Henri VERDIER, "Antonio Negri, le travail immatériel et la Révolution numérique," 25 June 2011. http://www.henriverdier.com/

241 Joël DE ROSNAY, *La révolte du pronétariat : des mass media aux médias des masses*, Fayard, 2005. http://www.pronetariat.com/

242 Matteo PASQUINELLI, "Google's PageRank Algorithm: A Diagram of the Cognitive Capitalism and the Rentier of the Common Intellect", 13 November 2009. http://matteopasquinelli.com/

243 Who mentions the idea of the Internet that is both a playground and a factory. See http://digitallabor.org/

244 Seth GODIN, "I Spread Your Idea Because," 27 October 2010. http://sethgodin.typepad.com/

245 Chris ANDERSON, *Makers: The New Industrial Revolution*, Crown Business, 2012. French translation: Chris ANDERSON, *Makers: La nouvelle revolution industrielle*, Pearson, 2012.

users in France and collect data through regular and systematic monitoring of their online activity are not required to pay taxes in France.

2.2.2. The fundamental data protection legislation provides a preliminary curb on companies' exploitation of users' personal data

The notion of the value of data, especially personal data, is not self-evident, given the fundamental data protection laws. The origin of data protection laws was the SAFARI project[246]. The press first exposed SAFARI in 1974[247]. The purpose of the project was to match all of the files that the government had on individuals and collate their personal data under a number assigned by the French National Statistics Institute (INSEE). The project caused outrage at the time and led to the drafting of legislation that resulted in the Act of 6 January 1978 on data processing, databases and freedom, which endowed individuals with several fundamental rights with regard to the data about them held by organisations[248] and established an independent government authority, the National Commission on Data Processing and Freedom (CNIL).

Since then, preliminary harmonisation of personal data protection laws has begun at the European level. Directive 95/46/EC of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data was transposed into French law by the Act of 6 August 2004[249]. Before the emergence of the digital economy, this harmonisation failed to answer certain questions arising from recent digital economy developments, and more specifically, the emergence of massive data storage and processing technologies and the considerable scope for the extension of personal data into new areas. For these reasons, a proposed European Regulation is currently being discussed. It calls for:

- Extension of European data protection laws to cover entities controlling the processing such data that are not located in the European Union. Companies that collect data about residents of the European Union would be subject to these laws, if the ultimate purpose of the processing is related to supplying goods and services to those residents or to *observing their behaviour*.
- A single supervisory authority to have sole jurisdiction ("one-stop shop"), which would be the authority of the country where the main establishment is located, when the controller of the processing operations has locations in several Member States. This is in contrast to situation today, where the CNIL has jurisdiction over controllers that are located in France or that rely on processing resources located in France.
- Mandatory mutual assistance between national supervisory authorities and a requirement to communicate to a European Data Protection Board (which would take over from the Article 29 Working Group) any decision by a national authority that affects other EU countries or that is likely to have a substantial impact on the free movement of data within the European Union (consistency mechanism).
- Virtual elimination of the prior notification rules for processing operations, with, in exchange, a requirement to document processing operations in an internal record and

[246] Système automatisé pour les fichiers administratifs et le répertoire des individus. (Automated administrative database and register of individuals system).

[247] Philippe BOUCHER, "Safari ou la chasse au Français," *Le Monde*, 21 March 1974.

[248] Right to information, right to access, right to rectification, and erasure, right to opposition and right to indirect access. http://www.cnil.fr/

[249] Act 2004-801 of 6 August 2004 on the protection of natural persons with respect to processing of personal data, amending Act 78-17 du 6 January 1978 on data processing, databases and freedom.

to appoint a data protection officer in most cases, especially when processing involves "*regular and systematic monitoring*" of individuals' behaviour.

- Implementation of a new transparency and data minimisation principles;
- Implementation of an accountability principle, which makes the controller of the processing operations accountable for the internal mechanisms used to ensure that processing operations comply with the data protection rules. Procedures need to be drafted for exercising information, access and rectification rights.
- Extension of the right to access through the introduction of a right to data portability;
- Enshrinement of a right to be forgotten digitally.

One of the obstacles to European, and even international, harmonisation of personal data protection are the differences in the conceptions of the laws applying to such data between the Roman law countries (such as Germany and France) and the common law countries (such as the United Kingdom and the United States):

- Roman law countries have a personalistic conception of these data, focusing on the person who is the data subject. According to this conception, the subject and the data cannot be dissociated and the person maintains extensive inalienable rights to their data. This is somewhat similar to author's rights, which recognise the work produced as the expression of the author's personality and protect it on these grounds. Personalistic data laws make data inseparable from the data subject.
- Common law countries are more open to the notion of merchandising personal data, according to a utilitarian conception, focusing on data themselves, the value of the data and the economic effects of sharing them. In the United States, data protection abuses are not detected and prosecuted by an independent government authority, but by individuals who initiate their own lawsuits or join class actions. They are helped by lawyers, whose share of the damages awarded by the court in a civil suit makes them all the more aggressive.

This does not mean that the personalistic conception of personal data rights is inimical to the commercial use of data. It merely aims to *regulate* such use by laying down a number of principles: the data subject's consent for the collection of his or her data for a specified purpose and the right to access data for information, rectification or erasure. The new principles included in the proposed Regulation respond to issues that came up in the most recent developments in the digital economy and to the fact that everything now leaves a trail: portability, accountability and the right to be forgotten.

However, there is still a great deal of uncertainty:

- It is difficult to draw a clear dividing line between personal data and other data. Technological progress and the abundant data increasingly available on individuals make it easier and easier to use specific computer processing to identify individuals from seemingly anonymous data.

  In 2006, two journalists from the *New York Times* managed to determine the identity of a user of the AOL search engine after the company briefly disclosed the activity history of 20 million anonymous users so that this information could be used for research[250]. The following year, two researchers from the University of Texas managed to match film ratings in the IMDB movie database (owned by Amazon) to identify individuals from the data provided by Netflix as part of an algorithm contest it held to improve its recommendation engine[251].

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[250] Michael BARBARO and Tom ZELLER, JR., "A Face Is Exposed for AOL Searcher No. 4417749," *The New York Times*, 9 August 2006. http://www.nytimes.com/

[251] The contest was held from 2006 to 2009 with a prize of half a million dollars for the scientific team that came up with the algorithm that produced the most significant improvement in performance of the recommendation

The situation is especially critical in the United States, where the availability of commercial databases and the personal data protection laws make it possible to identify 87% of Americans with only their birthdate, gender and zip code[252]. But the ability to identify an individual directly or indirectly from anonymous data shows the potential extension of the scope of personal data in an economy that is so abundantly supplied with data generated by application users[253].

- There are also different ways to use personal data for commercial purposes. This suggests that, as is the case for copyrighted works, it is difficult to identify the share of value attributable to the data themselves and the share attributable to the service that uses them for commercial purposes and literally turns them into money.

2.2.3. "Alternative" business models trace the outlines of a digital trust market

Most digital economy business models are based on the use of data generated by users' activity, which makes it possible to achieve high returns to scale. However, some business models take a contrary and complementary approach, which consists of strengthening data protection or returning data to users so that they can benefit from most of the surplus created by the use of their data. These "alternative" business models are contributing to the rise of a "*digital trust*" market[254], which is seen as critical for the development of the digital economy. There are several types of such models:

- Tools for measuring influence and managing online reputations that enable users to obtain a clearer view of their online tracks and contributions that are still visible, or information about them from sources other than themselves. Examples of such services include Klout[255], an application reputed for its function that calculates an influence score on social networking applications, or such tools as *Me on the Web*, which Google offers to identified users[256].
- Tools for managing cookies, which are receptacles of navigation data stored in the user's browser by the applications that he or she visits, can let the user choose the advertisements displayed when browsing. The aboutAds platform, operated by the Digital Advertising Alliance consortium offers American Web users a function called *AdChoices Icon* or *Advertising Option Icon*, which lets users check to see if their behavioural data are collected or used to select the advertisements displayed to them[257]. A similar mechanism called "youronlinechoice" is promoted by the Internet

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engine that suggested videos for Netflix users. After the prize was awarded, the contest was shut down out of concern about disclosing aggregated databases on the consumption of videos on Netflix, which led to a class action lawsuit by four Netflix users, and because Netflix was making a gradual transition from renting DVDs sent through the mail to showing streaming videos on the Internet. http://en.wikipedia.org/wiki/Netflix_Prize

252 WORLD ECONOMIC FORUM, in collaboration with BOSTON CONSULTING GROUP, *Rethinking Personal Data: Strengthening Trust*, May 2012. http://www.bcg.com/

253 In a technological environment that offers so little protection for anonymity, the definition of personal data can be very broad, e.g. personal data are any data that can reduce uncertainty about a person's identity. See Pierre BELLANGER, "Les marchés conscients," 31 December 2012. http://www.skyrock.fm/bellanger/

254 Daniel KAPLAN and Renaud FRANCOU, *La confiance numérique, De nouveaux outils pour refonder la relation entre les organisations et les individus*, FYP, 2012.

255 Eric ELDON, "Growing Its Influence, Klout Gets Strategic Investment From Microsoft — And Serious Bing Integration," *Techcrunch*, 27 September 2012. http://techcrunch.com/

256 Sarah KESSLER, "Google Launches Tool for Online Reputation Management," *Mashable*, 16 June 2011. http://mashable.com/

257 "*The AdChoices Icon (also known as the "Advertising Option Icon") is a sign of consumer information and control for interest-based advertising (which is also referred to as "online behavioral advertising"). When you see the AdChoices Icon on a Web page or near a Web banner, it lets you know that information used to infer your interests is being gathered or used to improve the ads you see. By clicking on the AdChoices Icon, you learn about how interest-based ads are delivered to you. More importantly, the AdChoices Icon gives you the ability control whether you receive*

Advertising Bureau and it has been offered on the French market[258]. These initiatives promoted by advertising professionals are an attempt to curb the growing tendency of application users to use various means of blocking advertising displays or preventing data collection[259].

- Hosting and synchronisation services let users centralise their data and files "in the cloud" and access them from any one of several devices. This may be the core business of a company, as in the case of Dropbox, which has made remote file storage a mass market service by making it easier to use and by integrating its seamlessly into the users' application environment[260]. It may also be a service provided by a company as part of a broader range of business activities in order to forge a special relationship with its customers, as Apple has done with iCloud, or to improve the functional quality of one of the company's flagship products, as has been the case for Amazon's Whispersync synchronisation service, which lets users read the same e-book on several devices (computer, smartphone, Kindle) and instantly find their place, bookmarks and notes exactly as they left them[261].
- Digital identity management is the business taking the clearest position on the digital trust market. The purpose of this business is to offer secure storage of the most critical personal data (vital statistics, important confidential documents, health data) so that the user can authorise companies or government agencies to access to their personal data and then *control*, *monitor* and *revoke* this access. These services have also been called "*users' personal data protection agents*[262]" and are part of a potentially vast area for innovation that can go by different names: digital vaults[263], identity federations, and authentication. The companies on this market include specialised firms working for the mass market and business customers, and the major digital economy companies, which, because they already have a great deal of data on their users, are seeking to centralise and store all of users' data relating to their identity. In France, such corporations as the Post Office[264] (La Poste) and Caisse des dépôts et consigations[265] are trying to gain a foothold in the emerging digital trust market.
- It is also important to note different companies' moves to take up positions in the online payment market. Facebook has already started generating some of its revenue on this market[266]. Google recently launched Google Wallet[267]. Apple and Amazon already have their customers' banking details. Payment services are critical for the

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interest-based advertising and from which companies." Source: DIGITAL ADVERTISING ALLIANCE. See http://www.youradchoices.com/ and http://www.aboutads.info/

[258] The French version is available at http://www.youronlinechoices.com/fr/.

[259] Julien BREITFELD, "De la publicité," *Error 404*, 4 January 2012. http://blog.marklor.org/

[260] Victoria BARRET, "Dropbox: The Inside Story Of Tech's Hottest Startup," *Forbes*, 18 October 2011. http://www.forbes.com/

[261] James KENDRICK, "Amazon set to take on iCloud with WhisperSynch," *ZDNet*, 5 October 2011. http://www.zdnet.com/

[262] Guillaume PIOLLE, "Agents utilisateurs pour la protection des données personnelles: modélisation logique ET outils informatiques," (doctoral thesis), *Laboratoire d'informatique de Grenoble*, 2 June 2009. http://www.liglab.fr

[263] Natasha SINGER, "You For Sale: A Vault for Taking Charge of Your Online Life," *The New York Times*, 8 December 2012. http://www.nytimes.com/

[264] Xavier BISEUL, "La Poste, un intermédiaire de confiance pour les échanges numériques," *01 Net*, 12 September 2012. http://pro.01net.com/

[265] Philippe GUERRIER, "Charles du Boullay (CDC Arkhinéo) : 'Notre record 2010 : trois millions de factures dématérialisées en une journée'," *IT Espresso*, 25 March 2011. http://www.itespresso.fr/

[266] John KOETSIER, "Facebook payments to challenge PayPal, Google, Apple, and more," *Venture Beat*, 25 June 2012. http://venturebeat.com/

[267] Scott MATTESON, "Google Wallet: Where it's been and where it's going," *Tech Republic*, 30 November 2012. http://www.techrepublic.com/

authentication and identity management market, since they are the services that make it possible to forge a trust-based relationship with users comparable to that of banks with their customers. Despite some ambivalence about many aspects, banks enjoy sound and durable relationships with their customers.

2.2.4. Restitution of personal data is an "alternative" model that protects individuals *and* fosters innovation

"Alternative" business models stem from the keen competition to gain a foothold in the digital trust market:

- In this market, companies urge users to entrust them with their personal data and to allow them to authenticate this data for other companies. The companies that attain a dominant position will have a head start in forging a special link with individuals and collecting their personal data.
- Some models consist of matching authentication with the use of a central application, such as Facebook, Gmail or the Dropbox file hosting and synchronisation platform. Other models provide trusted third party services, independent of any applications, in line with the notion of empowering users vis-à-vis companies. Individuals' capacity to use their own data enables them to express more specific needs and access more customised services. It also enables them to have companies compete for their business and to make more informed comparisons of the products and services on offer.
- The idea that consumers can escape from companies' grasp and elude efforts to guide their choices has given rise to *vendor relationship management* (VRM). This is the mirror image of companies' *customer relationship management*[268]. VRM has given rise to a market where data are returned to consumers in order to inform their choices and to level the playing field, since digital economy companies already rely on the available data to make their own choices[269].

The restitution of personal data is the theme at the intersection of the various models. Restitution is more than data portability. It consists of promoting the restitution of data hosted on a platform that is part of an application ecosystem. The customisation and performance of these data are enhanced with four objectives in mind:

- Providing better protection of personal data and preventing their exploitation by private or public-sector organisations;
- Promoting customisation of services and empowering individuals in their dealings with organisations;
- Promoting innovation by lowering barriers to entry for the use of data that have already been entered and hosted elsewhere under the users' control;
- Achieving productivity gains and savings without compromising service quality.

The development of practices involving restitution of data to users can be seen in various trends and projects:

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[268] Term coined by Doc SEARLS that echoes "customer relationship management". See Doc SEARLS, *The Intention Economy: When Customers Take Charge*, Harvard Business Review Press, 2012. From the back cover:

"While marketers look for more ways to get personal with customers, including new tricks with "big data," customers are about to get personal in their own ways, with their own tools. Soon consumers will be able to: (1) Control the flow and use of personal data, (2) Build their own loyalty programs, (3) Dictate their own terms of service, and (4) Tell whole markets what they want, how they want it, where and when they should be able to get it, and how much it should cost. And they will do all of this outside of any one vendor's silo."

[269] Steve LOHR, "When There's No Such Thing as Too Much Information," *The New York Times*, 23 April 2011. http://www.nytimes.com/

- In the United States, *smart disclosure*[270] enables citizens to control service applications' access to their energy consumption data (*Green Button*), medical data (*Blue Button*, for veterans only) or education data (*Purple Button*). These initiatives are backed by the White House as part of public interest projects to save energy, improve healthcare and facilitate access to education. The "Obamacare" reform of the American healthcare, which will now be implemented following the favourable ruling by the Supreme Court and the re-election of Barack OBAMA as President of the United States, will greatly expand the scope for innovation with regard to the use of medical data to improve healthcare provision and coverage[271].
- In the United Kingdom, the *MiData* project takes the same approach, but focuses more on empowering consumers vis-à-vis large corporations: for example, the ability to obtain telephone consumption records going back several years, enables consumers to choose the plan that best suits their profile. As is the case for *vendor relationship management*, the inspiration comes from the consumer movement and is aimed at improving the way the market works by giving consumers the "arms" they need to make more informed purchasing decisions.
- In France, the "MesInfos" project, backed by Fondation Internet Nouvelle Génération (FING), is intended as an experiment for restitution of data to users in partnership with the major companies in various sectors[272].
- In every country, including France with Etalab[273], OpenData initiatives are making aggregated statistical data available to the public and the markets to enhance transparency and promote innovation. These initiatives are supposed encourage major corporations holding aggregated data that could give rise to innovation by third parties to follow suit.
- All of these projects are contributing to greater awareness, spurring major digital economy companies to do their part to improve the protection, portability and restitution of personal data. This has given us Google's Dashboard[274] or various functional improvements made to Facebook, such as the profile download function for users' activity data[275] introduced following the threat of a lawsuit from an Austrian

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[270] Maurice RONAI, "*Smart Disclosure* : de quoi s'agit-il ?" *Travaux publics*, 5 December 2012. http://travauxpublics.wordpress.com/. See also Cass SUNSTEIN (Administrator, Office of Information and Regulatory Affairs), "Disclosure and Simplification as Regulatory Tools," *Memorandum for the Heads of Executive Departments and Agencies*, 18 June 2010. http://www.whitehouse.gov/. Tim O'REILLY, "Some Context For Thinking the Future of Smart Disclosure," *O'Reilly Radar*, 30 March 2012. http://fr.slideshare.net/. Alex HOWARD, "What is smart disclosure?," *O'Reilly Radar*, 1 April 2012. http://radar.oreilly.com/. Richard H. THALER and Will TUCKER, "Smarter Information, Smarter Consumers," *Harvard Business Review*, January-February 2013. http://hbr.org/.

[271] "Fighting fit: Obamacare is inspiring a horde of hopeful entrepreneurs," *The Economist*, 1 December 2012. http://www.economist.com/

[272] Renaud FRANCOU, "MesInfos : quand les "données personnelles" deviennent vraiment… personnelles," *Internet Actu*, 4 December 2012. http://www.internetactu.net/

[273] Etalab is a Task Force reporting to the Prime Minister that has been commissioned to make public data available and to develop the French Open Data platform. http://www.etalab.gouv.fr/

[274] Stan SCHROEDER, "Google Dashboard: Now You Know What Google Knows About You," *Mashable*, 5 November 2009. http://mashable.com/

[275] For more about this function and its limitations, see Dennis O'REILLY, "Facebook's profile-download tool comes up short," *CNET*, 16 April 2012. http://howto.cnet.com/

user[276], or the new button added to the interface that provides a shortcut to the privacy functions[277].

The example of Facebook shows how a strategy for data protection and restitution, however reluctantly it is implemented, serves the company's interests in two ways:

- It protects the users' personal data and enhances the transparency of their use, which means that Facebook maintains its special relationship with its users, which is its strategic objective and the objective that places it in direct competition with the other digital economy companies.
- Restitution of users' personal data and facilitating their reuse through Facebook Connect and Open Graph means that Facebook does not lose ground to its competitors and actually becomes an essential platform, with an application ecosystem that further strengthens its market position[278].

Facebook has shown that the same ecosystem can include business models based on the use of personal data and alternative models with two objectives: returning some degree of control to users with regard to the use of their data and sharing the value created by storing these data with users. The ecosystem that combines these various models is what enables Facebook to diversify its revenue sources: with advertising, as well as customised recommendations, online games, sales and, increasingly, payment services[279].

In addition to the progress achieved by major corporations, the digital trust market is becoming an area for independent innovation, which is still in its earliest stages and where French companies still have an opportunity to build strong positions.

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[276] The data that Max SCHREMS finally obtained by exercising his right to access came in the form of 1,200 pages of PDF documents. Kevin J. O'BRIEN, "Austrian Law Student Faces Down Facebook," *The New York Times*, 5 February 2012. http://www.nytimes.com/

[277] Chris TAYLOR, "Facebook Rolls Out Privacy Shortcuts in Plain English," *Mashable*, 21 December 2012. http://mashable.com/

[278] By moving to the Facebook platform, Glassdoor, a well-established application that provides information about working conditions in companies, increased its number of users tenfold in 90 days, clearly demonstrating the value of the service rendered by Facebook to the companies that operate applications on its platform. See Sarah LACY, "Why Developers Won't Quit Facebook: Glassdoor Grows Registered Users 10X in 90 Days," *Pando Daily*, 23 August 2012. http://pandodaily.com/

In the same vein, the close links between Facebook and Zynga, a company that operates social games on the Facebook platform, is an illustration of this same relationship based on dependency and converging interests that arises between a platform and its developers. The latter rely on the platform's existing resources to minimise their investment in technical infrastructure and to help them reach more users. Meanwhile, the platform enhances its market position by capitalising on the drawing power of the applications and takes a cut of their revenue. The platform also uses the data generated by the developers' activity to continue to grow. See Peter DELEVETT, "Zynga and Facebook still dating but now free to see others," *Silicon Valley Mercury News*, 29 November 2012. http://www.mercurynews.com/

[279] Matt ROSOFF, "Facebook Has A HUGE Opportunity That People Are Ignoring," *Business Insider*, 27 March 2012. http://www.businessinsider.com/

3. Taxation is having a hard time keeping up with the pace of change in the digital economy

Tax planning by multinational digital economy corporations is not substantially different from tax planning in the rest of the economy. However, it is more intense and produces much greater effects, given the recent emergence of the digital economy, the strategies of the companies driving this economy, the nature of their business and the important role that intangible assets play. Most importantly, tax planning concerns a growing share of GDP, since the digital economy, far from being restricted to a given sector or industry, is gradually spreading to all sectors of the economy. In other words, as Marc ANDREESSEN wrote, "*software is eating the world*"[280].

For European Union countries, taxation of the digital economy is a crucial issue and it is a particularly urgent one for three reasons:

- Lost tax revenue for all developed countries: as the *New York Times,* pointed out in April 2012, "*Over the last two years, the 71 technology companies in the Standard & Poor's 500-stock index — including Apple, Google, Yahoo and Dell — reported paying worldwide cash taxes at a rate that, on average, was a third less than other S. & P. companies'.*" [281]
- Imbalance between the United States and the rest of the world: Most of the dominant companies in the digital economy are American, which means that they pay the bulk of their corporate income tax in the United States. Furthermore, the low tax rate that they pay is very unevenly distributed between the countries where they do business, threatening to leave European countries with a tiny share of corporate income tax revenue from multinational groups, since these more and more of these groups belong to the digital economy.
- Difficulties measuring the amounts involved. In the case of the VAT on electronically supplied services, a 2009 study[282] by Greenwich Consulting commissioned by the French Senate, estimated France's lost tax revenues at 300 million euros in 2008 and nearly 600 million euros in 2014. In the case of corporate income tax, the National Digital Council issued an opinion on 14 February 2012[283] that estimated the revenue generated in France by Google, Apple (iTunes), Amazon and Facebook at some 2.5 billion to 3 billion euros and that these companies paid an average of only 4 million euros in corporate income tax per year, whereas their tax bill under the French tax rules would have been some 500 million euros.

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[280] Marc ANDREESSEN, "Why Software Is Eating The World," *The Wall Street Journal*, 20 August 2011. http://online.wsj.com/

[281] Charles DUHIGG and David KOCIENIEWSKI, "How Apple Sidesteps Billions in Taxes," *The New York Times*, 28 April 2012. http://www.nytimes.com/

[282] GREENWICH CONSULTING, *Evaluer l'impact du développement d'Internet sur les finances de l'État*, Study commissioned by the French Senate, October 2009. http://www.senat.fr/

[283] CONSEIL NATIONAL DU NUMERIQUE, *Avis n°8 relatif aux pistes de réflexion en matière de fiscalité du numérique*, 14 February 2012. http://www.cnnumerique.fr/

3.1. National and international tax law is inadequate for the digital economy

3.1.1. Corporate taxation has been put to the test in the digital economy

3.1.1.1. Value Added Tax suffers from incomplete harmonisation

European harmonisation of the value added tax system is incomplete and unsatisfactory with regard to the digital economy. The rules governing the scope and base of the VAT have been gradually harmonised in Europe, leading to advanced convergence of national systems. However, the 2006 Directive on the common VAT system[284] still leaves room for tax competition between Member States through the combined effects of place of supply of services rules and a lack of uniform rates, since the Directive merely sets the minimum standard and reduced rates. Moreover, the European Union dropped the idea of a "community-wide system" where VAT would be collected at the European level and the revenue would be divided between the Member States according to a formula to be defined.

Competition between Member States is particularly intense with regard to electronically supplied services provided to persons that are not liable for VAT, primarily individual consumers. This is harmful for public finances and for companies located in Member States that have chosen to set their VAT rates higher than the authorised minimum. Sales of tangible goods are taxed in the State where they are consumed and not in the Member State where the shipper has its registered office[285]. On the other hand, provision of electronically supplied services by a company located in a Member State to a person that is not liable to VAT residing in another Member State are subject to VAT in the service provider's State and in accordance with the applicable rules in that State.

European law requires a broad interpretation of electronically supplied services. This category[286] covers the supply of software, images, texts, music, films and games. As the tax laws stand, there is an incentive for companies that sell intangible "objects" (which are actually services) to locate in the Member States with the lowest VAT rates and do business from those States. This is the approach used by companies like Amazon or Apple, which have established their European "bridgeheads" in such countries, putting French companies in similar lines of business and charging VAT at the French rate on their electronically supplied services at a competitive disadvantage.

The Union responded to this critical situation by changing the place of supply of services rules in the 2006 Directive. Under the terms of Directive 2008/8/EC of 12 February 2008, the VAT on electronically supplied services will be determined according to the rules applying in the State where the services are consumed. The supplier will still assess the tax and Member State where the supplier's registered office is located will collect the tax, but the tax collected will be passed on to the Member State where the service is consumed through a "one-stop shop" system. The new rules were the fruit of some very tough negotiations, but they will not come into force until 1 January 2015 and only part of the tax revenue will be passed on up until 2019. The share passed on will be only 70% of the tax revenue in the first two years, and then 85% in the following two years. Despite the delay and its gradual entry into force, this reform of the place of supply of services rules for the VAT rules on electronically supplied services shows that the Member States are able to reach a unanimous agreement when dealing with major industrial and fiscal issues.

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[284] Directive 2006/112/EC of 28 November 2006 on the common system of VAT.

[285] As long as the vendor's sales in France exceed €100,000 in the year.

[286] See annex II of Directive 2006/112/EC.

3.1.1.2. The place of taxation rules for corporate income tax are inadequate

French corporate income tax is governed by the territoriality principle. Only the profits of companies doing business on French soil are taxed in France, regardless of where the companies' registered offices are located. This means that a French company is not taxed in France on the profits that it makes from undertakings doing business in other countries. Likewise, companies with their registered offices in other countries are taxed in France only on the profits that can be deemed to come from their business in France.

The territoriality rules for corporate income tax, as they are interpreted by the tax administration and the courts, are not adapted to the digital economy:

- Under domestic law, the notion of business in France covers the habitual performance of an activity on French soil, which can mean three things: the business is carried out in France by an autonomous establishment; the business is carried out in France, without an establishment, through representatives that are not distinct legal entities; or the business is carried out as part of a set of operations constituting a complete business cycle in France[287]. The first two involve a physical presence in France, which, in the first case, means a "*tangible installation with some degree of permanence*[288]" and, in the second case, means the presence of a natural or legal person in France. On the whole, domestic law stresses the criteria of a tangible presence on French soil, which is rarely the case in the business activities that are characteristic of the digital economy[289].
- There are similar criteria set out in the bilateral tax conventions intended to eliminate double taxation. If there is a conflict between the domestic territoriality rules of the States parties to the conventions, the States opt to attribute the power to tax to the country where the company is located[290], rather than the country where the profits were made. The only exception to this rule is in the case of a permanent establishment conducting the business in the country where the profits are made. The notion of permanent establishment brings up the notions of "*fixed place of business*" or dependent agent[291], which both involve the tangible presence of premises or people under the interpretation given in the OECD commentaries. Just like domestic tax law, international tax law is also poorly suited to the nature of business in the digital economy.

The notion of a fixed place of business hardly ever applies in the digital economy In its commentaries on the model convention, the OECD considers that a geostationary satellite over a country cannot constitute a fixed place of business from which the company operating the satellite carries on its business in that country. If there is no registered office in that country, there is no permanent establishment that gives the Government the power to tax the

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[287] Even if a foreign company does not have any establishments or representatives in France, it must be considered that it does business in France when its operations there constitute a "complete business cycle", which means a series of commercial, artisanal or industrial operations with a specific objective that constitute a coherent whole, provided that the operations can be distinguished by their nature or their execution procedures from the company's other operations. The most illustrative example is that of a foreign company that resells merchandise in France that it has purchased in France either directly or through representatives that are not separate legal entities (CE 22 May 1963, n°46.870: Dupont 9/63 p.589).

[288] Documentation administrative de base 4 H 1412 § 6 s.

[289] For example, Facebook did not open an office in France until it had already acquired 8 million users in the country.

[290] At least, they do if they comply with the OECD model, as is the case for the conventions that France has signed.

[291] Article 5(5) of the OECD Model stipulates that a when a dependent agent is acting on behalf of a company and habitually exercises in a Contracting State an authority to conclude contracts in the company's name, then that company shall be deemed to have a permanent establishment in that State in respect of any activities that that person undertakes for the company.

company[292]. In the same way, the fact that a telephone operator carries on its business in a country where it does not have its own network, meaning that it carries on its business there under a roaming agreement, cannot be grounds for considering that the company has a permanent establishment in the country by virtue of the network that it uses there[293].

Consequently, international tax law does not fully capture the intangible nature of factors of production and exchanges in the digital economy. This is particularly true for the commentaries on the OECD model tax convention. The definition of a permanent establishment, when it is interpreted as being based on the presence of a "*fixed place of business*," did give rise to a revision of the OECD commentaries in 2003 to take account of the specific features of electronic commerce. For example, it is agree that a server hosting an application and making it accessible is a piece of equipment that has a physical location. Therefore, it may constitute a "*fixed place of business*". But the OECD makes a distinction between the server (hardware) and the data and computer code (software), which cannot constitute a permanent establishment because they are intangible.

There was not much discussion of the territoriality of corporate income tax outside the OECD either. The year 1999 saw only one publication dealing with taxation. This paper came from the Berkman Center at Harvard University, a research centre producing authoritative work on social and digital economy issues[294]. After that, academic work in this field in the United States primarily limited itself to discussing the wisdom of extending sales tax to Internet retail sales or else creating specific Internet taxation, which had been banned by the Internet Tax Freedom Act passed by Congress in 1998 and renewed ever since then. Meanwhile, the European Union passed Directive 2002/20/EC called "authorisation"[295], which, like the American *Internet Tax Freedom Act*, prohibits any taxes on the access fees charged by an Internet access provider[296]. There has not been any legislation in France to change the direct taxation rules in order to take account of the growth of the digital economy. At the same time, few tax law specialists have done any work based on an in-depth analysis of the digital economy and its impact on the direct taxes paid by businesses[297].

3.1.1.3. The problems with taxing profits in France have repercussions on local direct taxation.

The local business tax (contribution économique territoriale – CET) combines a business property tax with a tax on business value added:

- The business property tax is levied on all self-employed persons carrying on a professional activity that is not covered by one of the automatic or optional exemptions defined by law. However, Article 1447, III of the General Tax Code explicitly stipulates

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[292] OECD Commentaries on Article 5

[293] *Ibid.*

[294] Austan GOOLSBEE and Jonathan ZITTRAIN, "Evaluating the Costs and Benefits of Taxing Internet Commerce," *National Tax Journal*, May 1999. http://cyber.law.harvard.edu/ See also Austan GOOLSBEE, "In a World Without Borders: The Impact of Taxes on Internet Commerce," November 1999. http://faculty.chicagobooth.edu/

[295] Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services.

[296] More specifically, Article 12 of the Directive stipulates that "administrative charges" imposed on Internet access providers shall cover only the administrative costs which will be incurred in the management, control and enforcement of the general authorisation scheme and of rights of use and of specific obligations as referred to in the Directive.

[297] However, there have been signs of concern related to the development of cloud computing. See James CARR, Jason HOERNER, Shirish RAJURKAR and Chanin CHANGTOR, "Cloud Computing: U.S. Tax Compliance Complexity for Foreign Subsidiaries," *The Tax Executive*, January-February 2012.

that individuals or corporations are not liable for business property tax if their activities are not liable for tax on the profits.

This means that a person or corporation is not liable for business property tax if they are not subject to personal or corporate income tax under the territoriality rules applying to such taxes. This is true for the major digital economy companies, which are therefore exempt from business property tax even though they carry on an activity liable to the tax under the terms of Article 1447, I of the General Tax Code.

- Under the terms of Article 1586 ter, I of the General Tax Code, the tax on business value added applies to persons carrying on an activity that is liable to business property tax when their revenue is in excess of 152,500 euros. Consequently, if a company carries on a business in France where the profits are not taxed in France under the terms of the territoriality rules applying to corporate income tax (or personal income tax), that company will not be liable to the tax on business value added from the same activity either, even though it may in fact fall within the scope of the business property tax.

3.1.2. France's specific tax rules do not take account the way the digital economy actually works

3.1.2.1. Special-purpose taxes on profits based on territoriality rules

The Television services tax (TST)[298] concerns two categories of players on the broadcasting market:

- Producers of television services[299], which are companies, primarily television channels, that "*programme national, regional and local television shows, regardless of the broadcasting method (over-the-air, satellite, cable, fixed or mobile internet, etc.)*";
- Distributors[300] of television services, which also includes providers of video on demand ("VoD") services, as long as the service relates to making programming available on demand and is thus distinct from broadcasting;
- Producers and distributors are not liable to the TST, regardless of the electronic communications network used, unless the registered office of their business is in France or they have a permanent establishment in France.

Internet service plans are liable to the "distributor TST" if they include packages of television channels (IPTV)[301] offered by the access provider and for the proportion of the service package price corresponding the television access. Article 20 of the 2012 Budget Act calls for any entity offering access to communication services for online users or telephone users to be considered as a distributor of television services, when the services they offer can be used to access television services. However, the European Commission[302] has expressed some doubts about the compatibility of making all Internet access packages liable to the tax

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[298] This tax is codified in Articles L.115-6 and L.115-7 of the Cinema and Animated Picture Code. It is collected by the CNC and used to finance the programme industry support fund (COSIP).

[299] Television services shall be deemed to be any electronic communication services intended to be received by the public at large or by a category of the public where the main programme is made up of an orderly set of broadcasts of images and sound (Article 2 of Act 86-1067 of 30 September on freedom of communication).

[300] Any person that establishes contractual relationships with the producers of services to provide audio-visual communications services available to the public over an electronic communications network (Article 2b of Act 86-1067 of 30 September on freedom of communication).

[301] Service plans are called triple play plans when broadband access, via ADSL technology in most cases, is used to combine Internet access, VOIP telephone service and IPTV television service.

[302] The Commission launched an inquiry on this topic, as it had done for the telecommunications tax levied under Article 302b KH of the General Tax Code to offset the elimination of advertising on France Télévision network.

(excluding "triple play" packages) with Article 12 of the "Authorisation" Directive[303]. In practice, access to movies and broadcasts is available not only through the packages of channels offered by access providers, but also via "native" applications that can be run on smartphones and tablets using applications downloaded from the Internet, installed and run on computers (e.g. iTunes) or via any Web browser. The 2012 Budget Act initially delayed implementation of these provisions until 1 January 2013; the amended 2012 Budget Act the delayed it further, until 1 January 2014.

To date, the "distributor TST" cannot be applied to the new players on the television market, which, like Apple with iTunes, Netflix, Amazon or Google, broadcast video content over the Internet via a browser, a proprietary device or a specialised application. The companies that provide these distribution services do not have registered offices or permanent establishments in France[304].

In response to tax base erosion arising from the territoriality of the "distributor TST", a recent report on smart television[305] came up with an alternative proposal, based on the interconnected economy. It suggests that telecommunications operators collect a tax on transactions generated by online services and hand the revenue over to the National Cinema and Animated Picture Centre (CNC) based on an assessment of the share of overall consumption of online services represented by video content[306]. The proposed tax is aimed at transactions that transit towards telecommunications operators from another telecommunications operator or a player with a direct interconnection[307] (supplier of an online service or technical intermediary[308]). The proposal presumes that incoming flows can be measured at interconnection points (or "peering points"[309]). It would also imply that Internet access providers become tax collectors, which raises the delicate issue of the enforcement powers that should be attributed to them with respect to the companies that have data flows transiting through their networks[310].

Finally, the remuneration for private copying[311] is not a tax per se, or even a statutory levy in the legal sense of the term. However, it has a similar effect in economic terms, since it is charged on the purchase of any device that can be used to store copyrighted content digitally. This includes smartphones and tablets, which are becoming the primary devices for

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303 Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services.

304 Under these circumstances, these companies are also exempt from the special requirements under broadcasting industry regulations, including the requirement that producers include a quota of European content in their programmes and the requirement that a share of their operating revenue be used to finance cinema production.

305 Takis CANDILIS, Philippe LEVRIER, Jérémie MANIGNE, Martin ROGARD, Marc TESSIER, *La télévision connectée, Report commissioned by the Minister of Culture and Communication and by the Minister for Industry, Energy and the Digital Economy*, November 2011. http://www.dgmic.culture.gouv.fr/

306 It is very hard to measure this, since bandwidth consumption has no relation to value added.

307 "*Technical intermediaries (transit operators, content delivery networks, hosts) can pass on this amount on to their customers*". Takis CANDILIS *et al., ibid.*

308 On this point, see ruling 12-D-18 by the French Competition Authority on practices in the mutual interconnection services sectors with regard to Internet connections http://www.autoritedelaconcurrence.fr/

309 Andrew BLUM, *Tubes: A Journey to the Center of the Internet*, Ecco, 2012.

310 This also raises questions about the compatibility of such powers with the "authorisation" Directive.

311 Article L.311-1 of the French Intellectual Property Code stipulates, "*The authors and performers of works fixed on phonograms or videograms and the producers of such phonograms or videograms shall be entitled to remuneration for the reproduction of those works made in accordance with item 2 of Article L122-5 and item 2 of Article L211-3 (*i.e. copies or reproductions reserved strictly for the private use of the copier and not intended for collective use). *The authors and publishers of works fixed on any other medium are also entitled to remuneration for the reproduction of those works made in accordance with item 2 of Article L122-5 and item 2 of Article L211-3, on a digital recording medium.*"

Internet access[312]. The development of cloud computing challenges this remuneration mechanism, which was devised at the time when analogue media were used private copying. It raises issues that the High Council of Literary and Artistic Rights dealt with in its opinion dated 23 October 2012[313]. The opinion finds that the private copying exception applies to multiple reproductions of content that users store on their personal devices via the synchronisation functions available with cloud computing. The High Council then ruled in favour of having these reproductions placed under the economic rules on private copying and the applicable remuneration criteria. Disputes in several European countries have challenged the procedures applied under the private copying rules and the growing numbers of such rules have weakened the underlying principles of the arrangement.

The current paradoxical developments in special-purpose taxes to support cultural industries are paradoxical. The problems that copyright holders are having in their negotiations with digital economy companies have led some players, who have not been much concerned about special-purpose taxes, to call for such taxes, based on the model used to pre-finance film production. Conversely, the territoriality rules mean that such taxes are actually subject to the same base erosion as corporate income tax. This is why newspaper publishers have asked public authorities to grant them something similar to a copyright that establishes the principle of fair remuneration for links to newspaper articles displayed by search engines rather than asking for new tax measures.

3.1.2.2. The proposals to tax online advertising and sales are not suited to their purpose

In addition to the cultural sector, there are other proposals for taxation of the digital economy that are aimed at certain sectors or business models. In his information report setting out a roadmap for neutral and fair taxation of the digital economy and the appended bill[314], Senator Philippe MARINI, Chairman of the Senate Finance Committee, proposes two sector-specific taxes:

- A tax on online advertising[315], to be paid by advertising agencies based on the sums paid by advertisers before agency commissions and before VAT for advertising services aimed at residents of metropolitan France and France's overseas possessions. The advertising services in question are those provided by search engines, displays of commercial messages, related links, e-mail messages, online product and service comparison engines for mobile telephones. The tax rate would be 0.5% of sums between 20 million and 250 million euros and 1% of sums greater than 250 million euros.
- A tax on electronic commerce[316] that would be paid by any person selling or renting goods and services to any resident of metropolitan France or France's overseas possessions who is not in the business of selling or renting goods and services. The tax rate would be 0.25% of annual turnover in excess of 460,000 euros.

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[312] Personal computers were exempted for political reasons at the time. This exemption has never been challenged.

[313] CONSEIL SUPÉRIEUR DE LA PROPRIÉTÉ LITTÉRAIRE ET ARTISTIQUE, *Opinion relating to the legal and economic issues raised by the development of cloud computing technologies,"* 23 October 2012. http://www.culturecommunication.gouv.fr/

[314] See the report by Philippe MARINI, Senator for the Oise Département, *Une feuille de route pour une fiscalité numérique neutre et équitable*, Information Report compiled on behalf of the Finance Committee No. 614 (2011-2012), 27 June 2012. http://www.senat.fr/

[315] More specifically, on advertising disseminated by electronic means other that telephony.

[316] Meaning sales and rentals of goods and services at the customer's request arranged by means of electronic communications other than telephone calls.

The purpose of these taxes is to impose indirect levies on the profits that the major digital economy companies earn in France, since most of these companies are not located in France. They would apply pending changes in international tax laws that rebalance tax powers between source and residence States. Since the level "net profit" cannot be determined, the idea is to capture flows (revenue) by means of an excise tax or a turnover tax.

The other proclaimed purpose of the proposals is to re-establish equal treatment of certain sectors of the conventional economy and their digital economy counterparts. For example, the tax on online advertising is meant to be the digital counterpart to taxes on radio and television advertising[317] and tax on expenditure for printed flyers or advertisements printed in free newspapers[318]. The tax on electronic commerce is meant to be the digital counterpart to the tax on retail floor space[319].

There are some drawbacks to these proposals:

- They focus on specific sectors and business models rather than on the digital economy as a whole, which makes them vulnerable to rapid circumvention, given the pace of change in the digital economy, and likely to distort the development of this economy. The proposed tax on online advertising, for example, omits peer-to-peer purchase recommendations, which could distort the market by penalising certain business models in relation to others.
- They only concern the most mature markets, where the digital revolution has already produced its full effects and which are dominated by a few large companies that are all American. The asymmetrical market positions in these sectors make the French companies in them particularly vulnerable to sector-specific taxation. Google is so dominant in the search market based on key words that it would probably be able to pass the entire cost of any sector-specific tax on to its advertisers. In the electronic commerce market, price competition is so fierce that companies' profit margins, including Amazon's, could be threatened by an additional tax[320]. Although the purpose of the taxes is to make major American companies contribute to the government budget, the practical result could be a levy on French companies, in their capacity as advertisers, who would actually pay the cost of the tax on online advertising, along with French consumers.
- Since the taxes would be levied on companies located in a European Union country other than France, collection of the taxes depends on the goodwill of the tax administration in that country. Given the case law established by the European Court of Justice[321], it does seem difficult to require companies that are not located outside the European Union to appoint a representative in France to be responsible for paying taxes. The desire to collect taxes and fight tax fraud is not in itself deemed to be an overriding public interest that justifies undermining fundamental freedoms in the

[317] Articles 302 bis KD and 302 bis KG of the French General Tax Code.

[318] Article 302 bis MA of the French General Tax Code.

[319] Instituted by Article 3 of Act 72-657 of 13 July 1972 instituting measures to support certain categories of elderly merchants and artisans, as amended by Article 77 the 2010 Budget Act.

[320] Very few French e-commerce companies are pure players. Most of them are subsidiaries of "conventional" commerce companies where the e-commerce tax would be added to the commercial premises tax. The provision in the bill that allows for a share of the e-commerce tax to be deducted from commercial premises tax could be pointless in the case of companies that are affiliated, but legally distinct entities nonetheless and therefore separate filers.

[321] See for example EUCJ 5 May 2011 Case 267/09 European Commission v Portuguese Republic.

European Union, given that there are Directives on sharing information[322] and mutual assistance with collection[323] between Member States.

- Although public opinion may see such taxes as implicitly aimed at specific American digital economy companies[324], they might make these companies think that they are exempted from any future cooperation in the discussions about the need for them to participate in raising France's tax revenue, even if the actual burden of the taxes introduced does not fall on them.

3.1.2.3. Our European partners do not provide much inspiration

The CCCTB proposal[325] **to harmonise the base for corporate income tax is a worthwhile point of comparison.** The proposal is officially intended to facilitate the task of European companies by lowering compliance costs. This would be achieved by eliminating the difficulties related to determining intercompany transfer prices and by ending the virtual impossibility of offsetting the profits and losses of entities located in different countries. In practice, it is also a means to ensure fairer tax competition between Member States and an attempt by highly industrialised States to rebuild their severely eroded tax bases. The proposal is part of the broader debate about formulary apportionment of profits between countries, which is an exception to the arm's length principle that is the basis for determining transfer prices within multinational groups[326].

But the CCCTB fails to deal with the specific issues of the digital economy. On the one hand, progress on the proposal is slow, given the contradictory nature of its objectives, the fiscal stakes for the Member States and the difficulty in reaching a unanimous agreement. This weakens the underlying promise for the digital economy. The pace is too slow, given the urgency of establishing international tax law that is adapted to the digital economy. On the other hand, and in any event, the mechanism for apportioning taxable profits between countries emphasises tangible fixed assets and payroll, and omits intangible assets. Therefore, it seems poorly suited to the specific features of the digital economy and could even turn out to be counter-productive, if negotiations ever move forward, by failing to address the necessary discussion on the very nature of taxable events.

In addition, territoriality considerations are raised with regard to personal data protection, for example, which is the subject of a proposal for the European Union Regulation[327]. One of the debates surrounding this proposal is how territoriality criteria should be determined. As the proposal for the Regulation stands, it calls for a single supervisory authority to have sole competence, to be determined depending on the location of the main establishment of the company controlling the processing.

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[322] Council Directive 2011/16/EU of 15 February 2011 on administrative cooperation in the field of taxation and repealing Directive 77/799/EEC

[323] Council Directive 2010/24/EU of 16 March 2010 concerning mutual assistance for the recovery of claims relating to taxes, duties and other measures

[324] See the many articles in the media referring to the online advertising tax as the "*Google* tax".

[325] Proposal for a Council Directive COM (2011) 121/4 of 16 March 2011.

[326] Some non-OECD emerging countries, like Brazil and India, use the formulary apportionment principle to justify deviating from the arm's-length principle in their assessment of transactions in their countries and for the attribution of their tax powers. The UN international tax convention model that such countries use does generally retain a larger share of the tax revenue for the government of the source country, the country where the investment or any other activity is located, unlike the OECD model, which retains a large share for the country of residence of the investor, the trader, etc.

[327] Proposal for a Regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation) SEC (2012) 72 final.

Finally, the Member States themselves have not addressed the topic of taxation of the digital economy per se. Articles in the British and German press, along with the initiatives taken by British, German and French Finance Ministers at the G20, testify to our European partners' concern about the tax practices of digital economy companies. But these debates, which focus on Starbucks' tax-planning strategies in the United Kingdom[328], are not centred on the digital economy and the Task Force has not identified any legislative projects dealing specifically with taxation of the digital economy. Some Member States have merely taken some non-tax measures that are restricted to certain sectors. For example, the German government adopted a bill in August 2012 that called for newspaper and magazine publishers to have an exclusive right to make their content available to the public on the Internet for commercial purposes, and for search engines and news aggregator applications to remunerate newspaper and magazine sites for citing their content[329]. The bill has been submitted to the Bundestag. It will be examined by a committee of experts, which should produce its findings in early 2013, before the bill is discussed by Parliament[330].

3.1.3. Developments in the United States have been significant, but they hold few lessons for France

The United States has chosen to ban any specific taxation of the digital economy. The Internet Tax Freedom Act passed by Congress and signed into law by President Bill Clinton in 1998 was aimed at promoting development of the Internet as a source of growth and a vector for education and information. The Act prohibits the Federal government, States and local governments from introducing taxes on Internet access or from introducing taxes where the base is restricted to the Internet, such as taxes on data volume, bandwidth, e-mail messages or various bases relating to online sales. Sales made online can be taxed as such by States, but only if the same local taxes apply in the same State at the same rate to sales that are not related to the Internet, such as mail order sales. The United States Congress has extended the Internet Tax Freedom Act three times since it was first passed. The last extension was passed in 2007. The current moratorium is in force until 1 November 2014.

In 2010 and 2011, there was a heated debate in the United States about extending sales tax to online transactions. The United States is the only industrialised country that does not have value added tax. American transaction taxes take the form of sales taxes, which have the following features:

- Sales taxes apply only to transactions with end consumers. They have weak points compared to VAT from the tax administration's point of view: it is difficult to distinguish a sale to an end consumer from a sale to a business; it is difficult to supervise a tax where collection relies on a large number of small entities, without the matching of declarations for VAT deductions at every step in the value chain and the system of fractional payments[331].

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328 Eric PFANNER, "Starbucks Offers to Pay More British Tax Than Required," *The New York Times*, 6 December 2012. http://www.nytimes.com/

329 Nil SANYAS, "Presse en ligne : l'Allemagne veut mettre à mort Google News," *PCINpact*, 30 August 2012. http://www.pcinpact.com/

330 This is a hotly debated subject in Germany. Academics from the Max-Planck Institute for research on intellectual property and competition law, for example, are staunchly opposed to the bill. Max-PLANCK-INSTITUT FÜR IMMATERIALGÜTER- UND WETTBEWERBSRECHT, *Stellungnahme zum Gesetzesentwurf für eine Ergänzung des Urheberrechtsgesetzes durch ein Leistungsschutzrecht für Verleger*, 27 November 2012, Max-Planck-Gesellschaft. http://www.ip.mpg.de/

331 Guy DELORME, "La généralisation de la TVA et l'Europe, 1964-1967," *De Rivoli à Bercy, Souvenirs d'un inspecteur des finances 1952-1998*, Comité pour l'histoire économique et financière de la France, 2000.

- Sales taxes are levied and administered by the States. There is no federal sales tax. The main federal taxes are personal income tax and corporate tax on business profits. Each State has the sovereignty to define taxable transactions (and exemptions for specific sectors), the tax base, tax rates and supervisory procedures for sales tax. In addition, municipalities and counties may levy a sales tax that is added to the State sales tax. As of this writing, 45 of the 50 States have a general sales tax, with rates ranging from 2.9% in Colorado to 7.25% in California. In addition, there are local sales taxes that can be more than 10% in certain cities (in Alabama, for example).
- In its *National Bellas Hess vs Illinois* decision[332], which concerned a mail-order company located in Missouri, the United States Supreme Court ruled in 1967 that a State could require a company to collect the sales tax on sales in that State only if the company had a permanent establishment there. Without such a permanent establishment, collecting the tax was not the responsibility of the company, but the consumer, who was liable for an equivalent tax called the use tax[333]. However, except in certain sectors, such as the automotive sector (where dealers have traditionally helped to collect the use tax), this tax is impossible to supervise and it is no longer paid.

Since the middle of the nineteen-nineties, when e-commerce took off in the United States[334], all fifty States have exempted online sales from sales tax in pursuit of two political objectives:

- Promoting the development of the digital economy by exempting it from any specific taxation. This effort culminated in the passage of the Internet Tax Freedom Act in 1998. Since many sectors were already exempt from sales tax, it seemed natural to exempt online sales.
- Avoiding tax competition between States with the precedent set by the decision in *National Bellas Hess vs Illinois*. If a company does not have to collect sales tax except in the State where it is located, then it is easy to get around this requirement by locating in a State with a small population, where few sales are made. This means the sales tax becomes a use tax, which is impossible to supervise and, therefore, impossible to collect.

As the United States started sinking into a crisis in 2008, Texas was one of the first States to demand that Amazon collect sales tax from consumers resident in the State[335]. Since Texas has one of the biggest populations of any State, the number of transactions there was very high. Amazon also had an establishment in Texas, a distribution platform located in Irving, near Dallas. Amazon contested the demand by denying that it was established in Texas. Various efforts to pressure political leaders were unsuccessful[336] and Amazon finally decided in February 2011[337] to close its distribution platform in Irving in order to avoid being required to collect sales tax on behalf of the State[338].

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[332] National Bellas Hess vs Illinois 386 US 753, decision upheld in 1992 by the decision in Quill corp. vs North Dakota 504 US 298

[333] Annette NELLEN, "Overview of Internet Taxation Issues," *Bloomberg BNA Internet Law Resource Center*, 2012. http://www.cob.sjsu.edu/nellen_a/

[334] Amazon was founded by Jeff BEZOS in 1994.

[335] Maria HALKIAS, "Texas bills Amazon for millions in sales taxes," *Dallas Morning News*, 23 October 2010. http://www.dallasnews.com/

[336] Along with an attempt to pass a Texas State law restricting the requirements for collecting sales tax so that companies that operate only a warehouse or distribution centre in the State are exempt. See Barry HARREL, "Texas House bills take sides in Amazon fight," *Statesman*, 10 March 2011. http://www.statesman.com/

[337] Shane ALLEN, "Amazon Closing Irving Facility, Citing State Tax Battle," *NBC Dallas-Fort Worth*, 13 February2011. http://www.nbcdfw.com/

[338] In the end, Amazon did not follow through with its decision, see Maria HALKIAS, "Amazon hasn't closed its Irving distribution center, as it threatened," *Dallas Morning News*, 12 April 2011. http://www.dallasnews.com/

Plans to extend sales taxes were then proposed in many States, including Pennsylvania and California, either through a new interpretation of existing laws or through new legislation, which made Amazon's strategy more complicated at each step. The debate quickly flared up around California's plans to extend its sales tax, for four reasons: The fiscal stakes were huge, since California is the most populous of the fifty States and the State where the digital economy has developed the most. California has the highest sales tax rate in the United States, which has a significant impact on companies' profits or on prices for end consumers, depending on how competitive markets are. California is particularly prone to lobbying campaigns, since well-organised pressure groups with deep pockets can collect signatures for ballot initiatives for any type of legislation. Most importantly, California is a key State for digital economy companies, given its geographical size and the presence of Silicon Valley, the birthplace of the digital economy. Even Amazon, which has its registered office in Seattle, Washington, is unlikely to avoid having an establishment in California.

A fierce battle for public opinion was fought between the State of California and a coalition of economic interests led by Amazon. As was the case in Texas, Amazon started with retaliatory measures, such as preventing Californian members of its affiliate programme from selling their products in its catalogue[339]. Three types of arguments were put forward in the debate:

- For the California government is was a matter of having a prosperous digital economy contribute to the government's efforts to rebalance public finances and correct a less and less sustainable inequity between online commerce and conventional commerce[340].
- For Amazon and the digital economy companies in general, there were two dangers: the plan to extend sales tax would disrupt price competition in a sector where margins were already paper thin; it would also spell the end of the reasoning behind the tax exemption for the digital economy.
- A number of influential observers were growing more aware of the tax planning practices of major digital economy companies. The publisher, author and conference organiser, Tim O'REILLY wrote on his Google+ account that:

  "In an imaginary world where Jeff Bezos was as public spirited as he is far-sighted about pursuing competitive advantage, Amazon would not only willingly collect and pay sales tax, but would offer the infrastructure they built for doing so to other online businesses. Amazon would encourage other online retailers to also adopt this policy, realizing that a society in which every member pays a fair share is a far better society than one in which particular business segments or particular individuals successfully avoid paying taxes while still reaping the benefits that then must be paid for by others."[341]

As a political confrontation took shape[342]**, Amazon finally gave up its opposition to the plans of Texas, Pennsylvania and California**, agreeing to collect sales tax, but not without negotiating special agreements with each of these three States[343]. Amazon also managed to

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339 Danny SULLIVAN, "An Open Letter To Jeff Bezos On Terminating The Amazon Affiliate Program In California," *Daggle*, 30 June 2011. http://daggle.com/

340 Companies such as Wal-Mart (retail distribution) and Barnes & Noble (bookstore chain) supported the initiative through a campaign aimed at the general public called *Main Street Fairness*. See Violet BLUE, "Wal-Mart vs Amazon in California tax law battle: Booksellers in the crossfire," *ZDNet*, 20 July 2011. http://www.zdnet.com/

341 Tim O'REILLY, "This *New York Times* piece on the Amazon-California sales tax dispute…," *Google+*, 5 September 2011. http://plus.google.com/

342 Including the threat at one point of tightening up reporting requirements for consumers. See Chris MORRAN, "California May Go After Online Shoppers For Unpaid Taxes," *The Consumerist*, 22 March 2011. http://consumerist.com/

343 Laylan COPELIN, "Documents: Amazon risking little in Texas sales tax deal," *American Statesman*, 18 July 2012. http://www.statesman.com/

turn this new constraint into an industrial opportunity, which did not become obvious until later. Many observers initially welcomed Amazon's "good citizenship" and the digital economy's return to a form of normal tax practices. Fewer observers noted that Amazon seized the opportunity presented by the new requirement to collect sales tax in the most populous States to step up the expansion of its logistics facilities throughout the country. This brought the company closer to achieving its strategic goal of reducing its delivery times further so that it could eventually offer same-day delivery throughout the United States. This had several consequences:

- To achieve its goal of offering same-day delivery to all of its customers, Amazon stepped up its logistical innovation efforts, automating its warehouses with the acquisition of Kiva[344], placing orders in delivery lockers accessible to customers near their place of work[345] and, eventually, delivering purchases to the boots of customers' cars[346]. These are some of the innovative solutions already being used or available on the market that will enable Amazon to achieve further productivity gains in its logistics operations in the future.
- By reducing its delivery times even more, Amazon is preparing for head-to-head competition with local retailers[347] and retail chains. It could eventually compete with them for food sales, including the delivery of fresh produce. The leading retail chain, Wal-Mart, has not been mistaken and there are many signs of a coming intensification of the competition between America's two retail giants[348].

More and more States are extending their sales taxes to online sales. After Texas, Pennsylvania and California, New Jersey and Virginia will levy sales taxes on online purchases in 2013, followed by Indiana, Nevada and Tennessee in 2014. Meanwhile, New York, Kansas, Kentucky, Washington and North Dakota have all announced extension plans and 35% of American consumers now pay sales tax when they shop online[349].

As a case study, the extension of sales tax on online purchases has more to teach us about politics than about taxation. The Member States of the European Union have never exempted online purchases from VAT. The progressive extension of sales tax to online purchases in the United States merely brings the situation there into line with the situation in the European Union. However, there are four points worth making:

- Sales taxes, which are the responsibility of the States, are not harmonised at the federal level. Amazon argued that having to apply rules that differed from one state to the next was an obstacle to interstate commerce, which is protected by the Constitution and one of the most important criteria for determining whether the United States Congress has the power to make laws regarding economic and social matters. The proposed

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344 For 775 million dollars – and with the eventual impact on the number of jobs created by Amazon in the United States, which is a crucial issue in its negotiations with various States. See Mark P. MILLS, "Amazon's Kiva Robot Acquisition is Bullish for Both Amazon and American Jobs," *Forbes*, 23 March 2012. http://www.forbes.com/

345 Greg BESINGER, "Amazon's New Secret Weapon: Delivery Lockers," *The Wall Street Journal*, 7 August 2012. http://online.wsj.com/

346 Amazon is not offering this service yet, but it has already been tried in Belgium and Germany by a new company, Cardrops, which has entered into agreements with Volkswage and eBay for this purpose. See John BIGGS, "Cardrops Is A Service That Puts Stuff You Order Into The Trunk Of Your Car. Yeah. Really." *Techcrunch*, 20 October 2012. http://techcrunch.com/

347 Farhad MANJOO, "I Want It Today: How Amazon's ambitious new push for same-day delivery will destroy local retail," *Slate*, 11 July 2012. http://www.slate.com/

348 For example Wal-Mart has decided to stop selling Amazon's Kindle devices in its stores. See Stephanie CLIFFORD and Julie BOSMAN, "Wal-Mart Is Deleting the Kindle From Stores," *The New York Times*, 20 September 2012. http://www.nytimes.com/

349 Greg BENSINGER, "The Sales-Tax Effect on Amazon: Nada," *The Wall Street Journal Digits Blog*, 17 September 2012. http://blogs.wsj.com/digits/

"Marketplace Fairness Act[350]", supported by Amazon and backed by Senators from both parties is aimed at clarifying the criteria for permanent establishments and facilitating the collection of sales tax on behalf of the States, provided that the States simplify the applicable rules in accordance with the Streamlined Sales and Use Tax Agreement[351]. This bill has little chance of becoming law in view of the growing influence of the digital economy in Washington, DC[352] and the political difficulty in getting Congress to adopt tax reform[353]. Nonetheless, the bill is testimony to a move beyond the tax exemption reasoning underlying the Internet Tax Freedom Act.

- Sales taxes will not be extended to the provision of services over the Internet, since there is still a moratorium on any taxation of activities specific to the Internet.
- New taxes are not killing the digital economy. On the contrary, as shown by Amazon's example, a digital economy company with a business model that is affected by a new tax can also turn the situation to its own advantage by stepping up its expansion and its innovation efforts.
- There are formulary apportionment practices in the United States for the profits of companies doing business in more than one State. The apportionment formulae negotiated between States are based on accounting indicators such as tangible assets, payroll and sales revenue. The growth of the digital economy has even inspired territoriality-based reasoning using the location of advertising views to tax profits on advertising revenue. More specifically, a recent advisory opinion from the New York State tax administration's counsel upheld the principle that the profits of a company operating an online application financed through advertising revenue were taxable by New York State in the same proportion as the ratio of application users located in the State[354].

3.1.4. The G20's interest in fighting tax avoidance by multinational groups may provide impetus

A series of cases revealed by the press in several major countries have shed a harsh light on multinationals' tax avoidance practices, particularly in the digital economy. Some multinationals' alleged tax avoidance behaviour has given rise to the feeling that the leading industrialised countries are being deprived of large amounts of corporate income tax revenue. Multinationals' tax planning practices have reduced the taxable income reported in those countries and shifted profits to countries and territories with lower taxes. The loss of

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350 The bill has been posted at http://www.marketplacefairness.org/. See also Kate FREEMAN, "Amazon Sales Tax – What it Means for You,"*Mashable*, 28 July 2012. http://mashable.com/

351 The SSUTA is a sales tax harmonisation initiative launched in 2000 in response to proposed federal legislation to ban collecting sales tax on online transactions. In view of the harm such legislation would do to their finances, a number of States set up the voluntary SSUTA, which is body of harmonisation rules. To date, 24 States have signed the agreement. http://www.streamlinedsalestax.org/

352 Glenn KELMAN, "Watch out, Obama. The renegades of Silicon Valley are moving to the right," *Quartz*, 31 October 2012. http://qz.com/

353 Travis BROWN, "Blame Congress, Not California, For Lost Amazon.com Taxes," *Forbes*, 13 September 2012. http://www.forbes.com/

354 "The Advisory Opinion of WTAS LLC of 9 March 2009 determined that the owner or operator of an online application "*should base the allocation of its internet advertising revenue on the ratio of its New York subscribers to the number of subscribers everywhere.*

"The governing principle is to base the allocation, to the extent possible, on the number of people who view or read the advertisement in New York. (…) Although a website operator may not have any way of knowing where a subscriber is when (s)he views or clicks on an advertisement on the website, basing the apportionment on the location of the subscriber should provide a close approximation of this figure." See State of New York – Commissioner of Taxation and Finance, "Advisory Opinion – Petition no. C070706A," 16 June 2009. http://www.tax.ny.gov/

tax revenue harms households, which have to pay higher taxes to make up for the lost revenues.

Behind these headline-grabbing cases, there seems to be a growing political awareness of the problem in the major industrialised countries. The conventional rules for attributing the power to tax between countries have failed to keep pace with economic developments. The coordination of national tax systems is still based on a model where there is little international integration of companies. This coordination does not account for the growing importance of intangible assets in the creation of value or the role played by information and communication technologies.

In the spirit of the League of Nations' work in the nineteen-twenties, the purpose of the existing web of bilateral tax conventions was to eliminate double taxation. However, multinational sometimes play on the differences in countries' national legislation and the loopholes in the international rules in order to eliminate or substantially reduce their tax bill by not paying tax in the source country, where there is no withholding tax on profit, paying low taxes on profits in the country of residence and, finally, shifting of profits to the lead company of the group without incurring taxes.

The OECD Base Erosion and Profit Shifting project has identified three areas for improvement to fight multinationals' tax avoidance more effectively. The project came into being at the G20 meeting in Mexico in June 2012, where the final communiqué explicitly refers to the need to fight base erosion and profit shifting[355]. On the side lines of the G20 Finance Ministers held on 5 and 6 November 2012, where the final communiqué mentioned the same concerns, the German, British and French Ministers of Finance jointly requested that the OECD Secretary General carry out work on this topic with a view to identifying possible improvements to international tax systems.

The OECD is expected to give a progress report at the G20 meeting in early 2013, with a view to fighting excessively aggressive tax planning and ensuring better compliance with tax rules. The OECD was also asked to extend its work to include the very foundations of international tax rules, and how they might be adapted to current economic developments, including the take-off of the digital economy. The discussions should address the rules for attributing the power to tax, the rules for determining transfer prices, the wisdom of reintroducing withholding taxes, the need to put an end to hybrid arrangements[356], eliminating opportunities for treaty shopping, and a new definition of a permanent establishment within the context of the digital economy.

The digital is only one of the many facets of the OECD's work, which is quite broad in scope. But this work, which could lead to amendments to the bilateral tax convention model or the renegotiation of some of these conventions, or even the signature of a multilateral convention, which would take the place of the bilateral conventions for certain matters, will be an opportunity to make progress in discussions on how the specific characteristics of the digital economy should be dealt with under international tax rules.

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355 "*We reiterate the need to prevent base erosion and profit shifting and we will follow with attention the ongoing work of the OECD in this area.*" See G20 Leaders' Declaration, 19 June 2012, Los Cabos (Mexico). http://www.oecd.org/

356 Arrangements that take advantage of differences in the taxation of the same entity or the same flow of funds between two or more countries.

3.2. Tax laws fail to capture data and the "free labour" of application users

3.2.1. Intangible assets dominate the digital economy

Intangible assets are at the heart of the constantly shifting business models on highly concentrated markets. In an increasingly intangible economy, intangible assets represent immense wealth. A study that the Intangible Asset Observatory[357] published in 2007 draws distinctions between eight types of assets that are found in all companies to different degrees: customer base, organisation (which includes the distribution network and the internal quality policy), information system, suppliers, brands, technologies, shareholders (whose value depends on their knowledge of the company's business and their expectations in terms of return on capital invested) and employees (human capital).

Intangible assets are a challenge for taxation generally speaking. The wealth that intangible assets represent is only partially reported in the accounts, since there are no sufficiently reliable accounting tools for identifying and quantifying wealth when its existence is uncertain and its future is volatile. The same problem comes up when determining a company's taxable income[358], since taxation is based on the accounts. This means that some assets are omitted entirely or understated in the creation of value by the company.

Intangible assets are also a challenge for international taxation, as shown by the OECD's recent work. Their very nature makes it easy to locate intangible assets in a low-tax country. This creates major tax planning opportunities for multinational companies and a major risk of tax base erosion. It also creates significant imbalances and concentration, depending on the market position and registered office location of the company concerned.

The OECD is currently working on how to determine transfer prices for intangible assets. The two case studies are the use of intangible assets for the production of goods and services (e.g. use of a trademark) and the intercompany transfers related to the use of such assets, whether they are sold or licenced. In January 2011 The OECD Committee on Fiscal Affairs approved a scoping document[359] for the revision of the relevant chapters in the Transfer Pricing Guidelines (Chapters VI and VIII). The document deals with questions relating to the definition, identification and use of a transfer, with a view to determining the transfer price, to the allocation between associated enterprises and to the valuation of intangible assets.

One of the biggest controversies arising in the comments gathered relates to the scope of transfer pricing analysis. Under a minimalist approach, the analysis looks only at intangible assets that are identified by accounting regulations and intellectual property rights. Although it provides the greatest legal security, this approach is not likely to capture all of the intangibles that can be assigned a value, where use or transfer would result in compensation in an arm's length transaction. This is similar to the problem of recognizing know-how or goodwill in accounting.

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357 *"The Observatory's target is: to broaden the knowledge of the role and weight of intangible capital in the economic and social development of companies and administrations; to provide the appropriate methods and tools, and to help measure the evolution of companies' intangible assets and consequences on their profitability."* See http://www.observatoire-immateriel.com/

358 This point brings up the criteria that the French Council of State established in its judgment in the SA SIFE case (CE, 21 August 1996, No. 154448, *SA SIFE*) and its following judgments and the criteria established by the International Financial Reporting Standards (IFRS).

359 See the recent publication of the OECD CENTRE FOR TAX POLICY AND ADMINISTRATION, *Discussion Draft, Revision of the Special Considerations for Intangibles in Chapter VI of the OECD Transfer Pricing Guidelines*, 6 June-14 September 2012. http://www.oecd.org

The question of which intangible assets could trigger a review of transfer prices is especially relevant to the digital economy. Intangible assets are many times more valuable in the case of the brand or the know-how of a company that has been able to develop its business rapidly, attaining a global scale and serving up to hundreds of millions of users all over the world. The relative importance of intangible assets is all the greater because network effects enhance their value. It is also clear that accounting and tax laws do not consider all of the factors of production that actually contribute to the creation of value and that an excessively restricted approach could have harmful effects for governments.

3.2.2. Data are not an intangible asset per se

Assets are defined for accounting purposes in the French general chart of accounts[360]. Since France's General Tax Code does not include a definition of fixed assets, we must also refer to accounting regulations when dealing with tax matters[361].

According to accounting regulations, an asset is an identifiable element of a company's net worth that has an economic value for the company, this means an element that generates a resource the company controls as a result of past events and an element that is expected to produce future economic benefits. The cost or value of an asset should be possible to evaluate accurately.

An intangible asset is defined as non-monetary asset with no physical substance[362]. Identification of tangible fixed assets does not raise any particular problems. However, identification of intangible assets is less intuitive. Consequently, accounting regulations[363] stipulate that an intangible fixed asset can be identified if it can be separated from the company's activities, which means it could be sold, transferred, rented or exchanged on its own under a contract, or if it is the result of a legal or contractual right, even though this right may not be transferred or dissociated from the entity or from other rights and obligations.

The control criteria, which is critical for recognising an asset, assumes that the company controls the benefits resulting from the asset and that it assumes the related risks. Since 2005, and under the influence of IFRS, ownership is no longer required under the definition of assets and companies may record fixed assets that they do not own on their balance sheet, as long as they control them.

It is not clear how to recognise the set of personal data that a company collects from users as an asset under the law as it stands today. However, valuing users or "customers" as an asset, or information about these users is a common and accepted practice. The customer base is an element of goodwill[364]. And acquisition of customer information, in customer files, for example, is recognised as a new intangible asset[365]. Furthermore, the notion of goodwill, or the difference between net asset value and the price paid to acquire a company, makes it possible to make a link between valuation techniques and taxation. The number of users is also one of the elements used to determine goodwill, as could be seen with the Facebook IPO. But, in the case of personal data collected by a digital economy company,

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360 Article 211-1 and the following articles, in force since 2005.

361 In accordance with the principle set out in Article 38 quater of Annex III of the General Tax Code, which states that companies must comply with the definitions in the General Chart of Accounts, provided that those definitions are not incompatible with the applicable rules regarding the tax base.

362 General Chart of Accounts, Article 211-1, 3.

363 General Chart of Accounts, Article 211-3.

364 For the purposes of Article R 123-186 of the Commercial Code, goodwill includes the elements of goodwill that cannot be posted to other items.

365 CE, 10 July 1963, No. 57424, *Dupont* : RO, p. 394, *Dupont*, 1963, p. 690.

there are at least two obstacles to recognising them as an asset under the law as it stands now.

***First*, it is not clear how it can be legally proven that the company controls the personal data:**

- The law theoretically rules out the notion of ownership of personal data. According to the French Data Protection Act, personal data cannot be separated from the person[366]. The right to access data for information, rectification or erasure granted to users makes it impossible to consider that the company, in the absence of ownership, exercises any control over the data.
- Furthermore, if the company is a data host within the meaning of the 2000 directive, which mentions "*signals, writing, images, sound or messages of all kinds provided by*" users and "*made available to the public*", then it has no civil or criminal liability for the data posted online and merely undertakes to remove such items when notified.

Nevertheless, a company could be found to own personal data in two cases:

- On the one hand, control could be recognised if the company has a license to use the data, including, for example the user's consent to grant "*a worldwide, non-exclusive, royalty free license (with the right to sublicense) to use copy, reproduce, process, adapt, modify, publish, transmit, display and distribute such content*" for the content that the user has posted online[367]. In this case the license is proof that the company controls the data[368].
- On the other hand, control may be *de facto* if it is not *de jure.* The difficulty of exercising data access rights and the lack of data portability may lead to the recognition that the company has effective control of personal data. The same could be said in a case where, contrary to prevailing academic research practices, a company refuses to publish aggregated data from its users to back up a scientific paper[369]. But so far, case law has taken a legal approach to the question[370].

***Second*, accounting law considers that only acquired elements of goodwill can be recognised as intangible assets.** Intangible elements of goodwill created by the company's own activity, without requiring specific expenditure, are not reported as fixed assets, even though they could be sold as such[371]. For example, expenditure that helps to build up a company's customer base in general is expensed, and it cannot be attributed to a specific asset. Under the current economic and accounting approach, where data collection is seen as

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366 Somewhat like copyright, which applies to original works that are defined as works that are marked by the personality of their author. See SOCIETE DES AUTEURS ET COMPOSITEURS DRAMATIQUES, "L'auteur et son œuvre," *Principes généraux du droit d'auteur*. http://www.sacd.fr/

367 From the Terms of Service of Twitter, which are similar to those of YouTube. The recent introduction of this clause in the Instagram Terms of Service triggered negative user reactions and led the company to delay the changes to its terms of service. See Will OREMUS, "Why the Instagram Privacy Uproar is Absurd, in Three Nearly Identical Sentences" *Slate,* 19 December 2012. http://www.slate.fr/

368 Which are personal data if it is possible to identify the user directly or indirectly.

369 John MARKOFF, "Troves of Personal Data, Forbidden to Researchers," *The New York Times*, 21 May 2012. http://www.nytimes.com/

370 A contract that grants an exclusive sub-licence for the production and marketing of pharmaceuticals cannot be recorded as a fixed asset if it is an open-ended contract that can be terminated with no indemnity at anytime with only sixty days' notice. This is true, regardless of the fact that the open-ended contract was signed more than five years ago and regardless of the ownership links between the two companies parties to the contract. See CE, 16 October 2009, No. 308494, *Société Pfizer Holding France*, RJF 1/10 n°4.

371 See paragraph 3 of Article 311-3 of the General Chart of Accounts: "Expenditure for the internal creation of goodwill, brands, titles for newspapers and magazines, customer lists and other similar items in substance, cannot be distinguished from business development costs as a whole. Consequently, these items are not recorded as intangible fixed assets."

inseparable from the company's activities, it seems a delicate matter to identify data as a separate asset.

3.2.3. The massive use of "free labour" in the digital economy is not captured by taxation

Accounting and tax law does not regard the community of users and the free labour that it provides for digital economy companies as an asset for a company, but merely a market condition.

A recently published discussion draft on intangible assets[372] by the OECD points out the importance of distinguishing intangible assets from mere market conditions or other circumstances that cannot be owned, controlled or transferred by a single enterprise. The OECD explains that the features of a local market, such as its size, its competitiveness or the level of disposable household income are not intangible assets.

There are several possible ways for reintegrating the users' "free labour" into economic reasoning and, coincidentally, into tax reasoning:

- First, a reconstitution of the actual economic exchange between two players could be considered. This is the exchange in the digital economy where a service is provided in exchange for the provision of data. The process of breaking down two operations that have been joined together to avoid a flow of money is not unknown under accounting and tax law.

  For example, there are traces of such reasoning with regard to VAT. When there is a direct link between the delivery of a good that has been invoiced at a price lower than the usual price, or even provided free of charge, and the value of a service that the buyer undertakes to provide to the seller, the VAT on the sale must be based on the usual price of the good[373]. The case of "swaps" of goods and services that offset each other and are not invoiced is clearly included within the scope of VAT and it is up to the tax authorities to break down the two transactions, establish their value and levy the appropriate tax[374].

  It is hard to transpose this reasoning to the digital economy, since it is difficult to conceive of the user of an online application as a service provider liable to VAT. But if this reasoning were followed to tax profits, then the fact that the company benefits from "free labour" provided by users could be regarded as a donation to be counted as part of its taxable profits. The value of this labour should therefore be offset against the cost incurred by the company to provide the service given in exchange.
- Another possibility would be to consider the collection of data for free, or in exchange for a service, more precisely, as the acquisition of an intangible asset from a third party. This would make it possible to recognise the assets acquired in this way, which would become separable from the company's business, as fixed intangible assets.
- Finally, the existence of a community of users and the interest that this community shows in the services provided by the company could be regarded as an asset in themselves. Strictly speaking, this is not a discussion of the users' human capital[375],

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[372] 6 June 2012.

[373] See EUCJC, 23 November 1988, *Naturally Yours Cosmetics*, RJF 3/89 No. 294, and EUCJ, 2 June 1994, *Empire Stores Ltd*, RJF 7/94 No. 868.

[374] See CE, 10 April 2002, *SA Somagri*.

[375] The concept of "human capital" was first discussed in 1961 by the American economist, Theodore SCHULTZ, who expressed the concept in these terms: "*Although, it is obvious that people acquire useful skills and knowledge, it is not obvious that these skills and knowledge are a form of capital, that this capital is in substantial part a product of deliberate investment.*" See Theodore SCHULTZ, "Investment in Human Capital," *American Economic Review*, 1961.

which cannot be counted as an intangible asset belonging to the company, any more than the users' know-how can, since the users are not subordinated to the company and, therefore, are not controlled by it (as understood by the accounting regulations). The users' labour could be seen instead as providing the company with the potential to gather data and grow as a result, with a virtuous "snowball" effect, in accordance with the empirical "Metcalfe's law", which states that "*the value of a network is proportional to the square of the number of users connected to the system*"[376]. From this angle, it is conceivable to see this as an asset, as long as it is not merely passive acceptance of a free resource, like sunshine for a tourism business in a Southern European country, for example, but the company's own actual capacity to attract users. In a recent presentation on the quantitative approach to venture capital investments, Paul SINGH, leader of the 500startups fund, introduced the idea that "traction", meaning the increase in both the number of users and the intensity of their use of an application, was the "*new intellectual property*" to be considered in the valuation of digital economy startups[377].

3.2.4. Generally speaking, the economic nature of data cannot be fit into the pre-existing categories

The inadequacy of taxation reveals a larger issue: the economic classification of data and their statistical representation in the national economy[378]. Several American economists have already stressed the inability of economic statistics to identify data in GDP. The surprising finding that consumption of digital goods and services has been flat, or even declining, in real terms, meaning after correcting for any falls in prices[379], is blatantly inconsistent with the growth of the digital economy, which is visible in so many ways, such as the increase in the number of connected devices, the increase in the number of applications and files downloaded, the increase in the time spent using online applications, the growing share of such applications in the value chain of different sectors.

The activities that are specific to the digital economy are either treated as production of goods or production of services:

- In the nineteen-nineties, software was still treated as a good. At the time, most software was distributed on floppy discs or CD-ROMs packed in plastic boxes. It was then increasingly downloaded from the Internet and run on the users' computers. At the time, software was purchased in the same way as furniture and electrical appliances. In the digital economy, this period was the one where Microsoft dominated the software publishing market.
- Later on, changes in technologies and business models meant that software was treated more like a service. This meant that it was increasingly run on remote servers, and the notion of provision of service overtook the notion of selling a good. The emergence of

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376 *"Metcalfe's Law is a theoretical and empirical law formulated by Robert Metcalfe (founder of 3Com and the inventor of the Ethernet protocol) that explains the network effects related to information technology as they apply to such networks at the Internet, social networks and the World Wide Web."* http://fr.wikipedia.org/

377 Paul SINGH, "Moneyball: A Quantitative Approach to Angel Investing," *500startups*, August 2012. http://fr.slideshare.net/. On the exclusionary value of "traction", see also VENTURE HACKS, *Pitching Hacks: How to Pitch Investors*, 11 January 2009. http://venturehacks.com/

378 This discussion is based broadly on Michael MANDEL, "Beyond Goods and Services: The (Unmeasured) Rise of the Data-Driven Economy," *Progressive Policy Institute Policy Memo*, October 2012. http://www.progressivepolicy.org/

379 The U.S. Bureau of Economic Analysis reasons in terms of access and, although the digital economy is growing exponentially, it finds that the value added of Internet access by any means has decreased by 0.7% in real terms over ten years. Michael MANDEL, *ibid.*

the software-as-a-service model, which was popularised by Salesforce[380], testifies to this major shift in the economic nature of software[381].

In fact, as Michael MANDEL observed, the common feature in both cases, software-as-a-good or software-as-a-service, is that the user consumes data. Most of the data come from the user's hard drive in the first case, and from a remote server in the second. But in both cases, data are at the heart of the underlying economic activity. More generally, in the digital economy, where software is connected via a network, the use of software corresponds to an exchange of data between a company and the users of the application that the company operates.

If data are treated as a separate category from goods and services, their hybrid economic nature is revealed: like services, data are intangible, but, like goods, consumption of data can be deferred and they can be stored for the interval between their production and their consumption. This vision, which is consistent with the technology and business models, disrupts the analysis of activities in the digital economy: *"Online retailers such as Amazon provide customers with a wide range of data, such as product reviews and suggestions for other purchases. In effect, the online retailer is offering two 'products': The purchase of a physical product, plus access to related data on the product. That data is valuable to the customer, whether or not he or she makes a purchase at the original website. This value is not counted by the government statisticians."*[382]

Consequently, the data may be analysed economically from two angles:

- The data may be consumed: Using an online application represents a consumption of data. Given the time that users spend on the related activities, data consumed in this manner have a value for users, even if they are provided for free. To quantify this value, economists have tried to capture the "*value of the Internet*" for consumers[383] the "*bonus*" arising from the deployment of broadband Internet in various OECD countries[384] or the "*value of digital goods*" in an economy dominated by free access[385].
- Data may represent a capital expenditure: in accounting, an asset is "*an identifiable element of the net worth (…) with a positive economic value, meaning that it generates a resource that the entity controls as a result of past events and that the entity expects to produce a future economic benefit*"[386]. As in the case of a brand, a patent or an intellectual work, the data that an entity collects generate a resource that the entity controls, as long as its holds the right to use the data. Therefore, data have a value that is not dependent on the hardware and software used to collect them and to store them[387].

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380 Bob EVANS, "Global CIO: Salesforce.com Surge Pushes SaaS Into Mainstream," *Information Week*, 27 August 2009. http://www.informationweek.com/global-cio/

381 Dion HINCHCLIFFE, "Comparing Amazon's and Google's Platform-as-a-Service (PaaS) Offerings," *ZDNet*, 11 April 2008. http://www.zdnet.com/

382 Michael MANDEL, *ibid.*

383 Austan GOOLSBEE and Peter J. KLENOW, "Valuing Consumer Products by the Time Spent Using Them," *American Economic Review*, 2006.

384 Shane GREENSTEIN and Ryan MCDEVITT, "Measuring the Broadband Bonus in Thirty OECD Countries," *OECD Digital Economy Papers*, 2012.

385 Erik BRYNJOLFSSON and JooHee HO, "The Attention Economy: Measuring the Value of Free Goods on the Internet," manuscript. See Erik BRYNJOLFSSON, "Measuring the 'Attention Economy'," The MIT Center for Digital Business, 19 September 2012. http://digitalcommunity.mit.edu/

386 Article 211.1 of the General Chart of Accounts.

387 As explained by Michael MANDEL, "*flight data that is used to track airplanes is investment if it is stored and analysed in a way that gives insight into the best ways to arrange airline routes or logistics.*" See Michael MANDEL, *ibid.*

The bulk of the problems with taxing the digital economy stem from attempts to treat digital economy activities like the production of goods and services. These attempts are pointless, and even counter-productive. They distort the features of activities specific to the digital economy[388]. These activities consist of exchanges of data between the users of applications and the companies that operate them. These activities result in the consumption of data, which is poorly captured by official statistics at present. Yet, as is the case with supervision of transfer prices, the underlying flows can be valued by comparison to comparable flows. This is how the value of the digital economy can be shown.

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In any event, discussion of corporate taxation needs to resume urgently to cope with the growth of the digital economy. This economy has undergone further radical change since the latest major reforms by the OECD and the European Union. There are five major aspects to this change:

- The take-off of "Web 2.0" business models, which enable companies to leverage the activity of hundreds of millions of users to create value[389]. Amazon, Google, Apple and Facebook each have their own way of leveraging the spontaneous activity of their users, who are gradually being transformed into contributors to the production of the goods and services provided.
- The growth of Internet access through smartphones and tablets, which has caused the frequency of use of online services to increase many times over, has also disrupted business models, with the introduction of application stores, such as Apple's App Store, and triggered an industrial trend toward designing services that are simpler and more economical in terms of human and software resources[390].
- The growth of cloud computing, which reduces the work involved in designing and developing new applications, and has transformed hosting costs, which used to be fixed at high levels, into lower, variable costs as a result of the growing computing power of

[388] In another area, copyright is running into trouble because the pre-existing categories are not suited to determining the rights involved in the download of a music file. An American Federal Appeals Court ruled in 2010 that, contrary to the arguments presented by the petitioner (American Society of Composers, Authors and Publishers (ASCAP), the society that collects and distributes royalties), that a download of a file does not involve public performance rights; it involves only the reproduction rights. See *United States v. American Society of Composers, Authors and Publishers (ASCAP) et al.,* No. 09-0539, 2010 WL 3749292 (2nd Cir. 2010). The United States Supreme Court, which ASCAP petitioned as a last resort, declined to take up the case in October 2011. http://en.wikipedia.org/ and Nachman N. SUSSON, "Song Download and Performance Rights," *Music Business Journal*, Berklee School of Music, November 2011. http://www.thembj.org/

Because it is difficult to reconcile an online music application with pre-existing rights, particularly reproduction and public performance rights, the World Intellectual Property Organisation Performances and Phonograms Treaty of 1996, followed by the 2001 Directive on harmonising certain aspects of copyright and similar rights in the information society, introduced a third type of right the right of "*making available*". "*The right of making available is the right to authorize the making available to the public, by wire or wireless means, of any performance fixed in a phonogram, in such a way that members of the public may access the fixed performance from a place and at a time individually chosen by them. This right covers, in particular, on-demand, interactive making available through the Internet.*" http://www.wipo.int/

[389] On this point, the European Union is ahead. Directive 2000/31/EC "on electronic commerce" sets the rules regarding the responsibilities of publishers and hosts and introduced the first legal definition of hosts' activities that, a few years later, became "Web 2.0" characteristics. But this work has not been followed up in other legal matters, and in tax matters in particular. Hosts are "*natural or legal persons that provide, even at no charge, the storage of signals, texts, images, sounds or messages of all kinds provided by the recipients of these services to make them available to the public by means of online public performance services.*"

[390] Instagram, a photo-sharing application is the best example. In March 2012, when it was acquired by Facebook for one billion dollars, Instagram had nearly 30 million users around the world with a single mobile application and only 13 employees.

such gigantic software platforms as Amazon Web Services (AWS)[391], Microsoft Azure or Google Cloud Platform.

- Abundant data, particularly personal data are involved in the value creation process, with the development of powerful technologies for storing and processing data (called Big Data[392]). There are also new business models designed around the use of data and a new digital trust market has appeared[393].
- Finally, the growth of the digital economy in all sectors, in addition to those we identify with the Internet today. Now, tourism, banking, the automotive industry, telecommunications, energy, education and healthcare are about to undergo such equally radical changes as those seen since the middle of the nineteen-nineties in the music industry, in advertising and in retailing.

[391] Amazon Web Services (AWS) is now the software platform for many digital economy companies, including some of the largest. AWS hosts and drives the applications of Netflix, Pinterest, Heroku and even Instagram. It also hosted all of the platforms and applications developed for Barack OBAMA'S 2012 presidential campaign. See Sean GALLAGHER, "Built to win: Deep inside Obama's campaign tech," *Ars Technica*, 14 November 2012. http://arstechnica.com/

[392] MCKINSEY GLOBAL INSTITUTE, *Big Data: The Next Frontier for Innovation, Competition, and Productivity*, May 2011. http://www.mckinsey.com/

[393] "*The capacity to generate trust is an intangible asset that everyone is striving to create, defend and use. (….) Trust is not the same, depending on what is being exchanged, and also depending on the behaviour and values of those engaging in the exchange. 'Trusted third parties' are striving to emerge to provide this trust, by focusing more or less on some of these factors*." See Francis JUTAND, Daniel KAPLAN and Henri VERDIER, "Les nouveaux mécanismes de la confiance numérique," *Le Monde*, 7 May 2010. http://www.lemonde.fr/

4. The inadequate tax framework means that the growth of the digital economy has serious consequences for the domestic economy

The digital economy contributes to economic growth and development. It has been a decisive factor for innovation, productivity gains and the spectacular growth of the consumer surplus in industrialised countries. But it has also had harmful effects for two reasons: tax rules that are not adapted to the way value is created in the digital economy and the public authorities' inability, owing to the lack of tax revenue, to organise the dissemination of the productivity gains produced by the digital economy to the economy as a whole. The fact that the digital economy is gradually spreading to all sectors of the domestic economy makes it even more urgent to remedy the inadequacy of tax laws.

4.1. The effects of the shrinking tax base will gradually spread to the entire economy

4.1.1. Intermediation models, which are dominant in the digital economy, are draining the tax base of its substance

Intermediation business models lie at the heart of digital economy ecosystems. These models take the form of market places, with two distinct versions:

- Intermediation between consumers and businesses, which traditionally corresponds to the online advertising sector. Banner ads (display advertising) and sponsored links (search advertising) are used to redirect users to commercial applications and paid for with finder's commissions that are based on different indicators, depending on the sector and the power relationship between the advertiser and the advertising intermediary. These indicators include views (cost per mil), clicks (cost per click), data collection and forms filled out (cost per lead) or purchases (cost per action). The same intermediation rationale can be found in the market place business model popularised by Amazon Marketplace. It includes price comparison engines, online travel agencies (Expedia, Booking.com), deal-of-the-day companies (Groupon, LivingSocial) or a company like Uber, which puts consumers in contact with chauffeured car services.
- Intermediation between individuals became popular very early on with the Craigslist online want-ad service, which was a digital economy pioneer, and then eBay, which specialises in auctions of consumer goods. A few years after it was founded, eBay acquired the online payment giant, PayPal. More recently, the model has begun to spread to other more specific sectors, such as peer-to-peer car sharing (RelayRides), individual room and accommodation rentals (Airbnb) and even peer-to-peer loans (LendingClub[394]). The growth rate of the *peer-to-peer economy* is gathering speed as the underlying business models become more robust and adapt to the specific economic and legal context of each sector[395].

[394] Lending Club, which is about to make an IPO, after reaching a cumulative one billion dollars in outstanding peer-to-peer loans, has just welcomed the former Secretary of the United States Treasury, former President of Harvard University and Nobel laureate for economics, Larry Summers, to its board of directors. See Rip EMPSON, "With An IPO On Its Radar, Lending Club Adds Former Treasury Secretary Larry Summers To Its Heavyweight Board," *Techcrunch*, 13 December 2012. http://www.techcrunch.com/

[395] For a more complete overview, see Semi SHAH, "The P2P Evolution," *Techcrunch*, 1 May 2012. http://www.techcrunch.com/

4.1.1.1. Intermediaries are increasing their margins to the detriment of local businesses and reporting their profits in other countries

The growth of a market place for businesses affects the tax base by introducing a digital economy intermediary between suppliers (e.g. hotels) and their customers (e.g. tourists), which has two simultaneous effects:

- A static effect – in the digital economy, the market place operator can provide its services from another country or, if it has a permanent establishment in France, it can charge royalties for the use of its intellectual property, which is located in another country. These royalties are a deductible business expense that reduces the profits made in France and reported to the French tax administration. All else being equal, this means that the presence of the intermediary in the value chain automatically reduces the volume of profits declared by suppliers located in France, since they must pay a share of their margin as a finder's commission to a company that declares its profits in another country. The this share of the margin is subtracted from the supplier's profit on each transaction and the supplier's profits can only be maintained or increased by increasing business volume.
- A dynamic effect - as the market place becomes an essential venue for doing business, its growth and the intensity of the resulting competition may give the intermediary enough power to capture the profits made, since its market power enables it to raise the amount that it charges for each transaction. This means that the profit margin of companies located in France diminishes even further as the market place becomes an essential venue and every supplier needs to be present on it.

  Because they are digital economy companies, the intermediaries' strategy is to scale their businesses massively. The corollary of their drive for increasing returns to scale is that they require their customers to sign standard contracts and impose payment terms that leave very little room for negotiation. The result in the sectors concerned is a dynamic process where a growing share of the French-based suppliers' profits is passed down the chain to the intermediaries in contact with the customers and these intermediaries then declare their profits in another country. The potential impact on the corporate income tax revenue is exacerbated by the dynamics of the market place.

  This pressure is already being felt in such sectors as retail sales and travel. Some observers are now speculating that Amazon makes more money from operating its market place than from its own sales of products. It could, therefore, be tempted to increase its prices as its market power increases[396]. Similarly, the operation of Google's AdWords scheme, which auctions off search key words, has the potential to increase Google's surplus as the population of advertisers broadens to include individuals and small businesses, as well as the largest advertisers on the market.

In principle, suppliers pay intermediaries finder's commissions, within the framework of a general affiliation model. But the circuits for the payments between players, particularly when they cross borders, can be difficult to reconcile with tax law. Different procedures are used to pay intermediaries, depending on how the services they provide are defined in the contract signed with the supplier of the goods or services (commission or negotiated price). Similarly, different VAT rules apply, since the service may be provided from another European Union Member State or even from a non-Member State.

However, the ultimate purpose of the market place is not necessarily to increase the intermediary's margin. A company like Amazon, which operates for thin margins[397],

[396] See David STREITFELD, "Amazon's Diminishing Discounts," *The New York Times Bits Blog*. 22 November 2012. http://bits.blogs.nytimes.com/

[397] Thomas FRIEDMAN, an editorialist at the *New York Times* called out his readers on this topic in 1999, imagining how easy it was for any American to compete with Amazon by becoming a merchant and charging lower prices:

leverages its market place primarily to optimise its strategy for carrying a vast product range. It started out as a simple retail sales application, but it was transformed into a market place open to other sellers in order attract more customers by broadening the range of products and services available and by promising the lowest prices[398]. But this does not mean that it is giving up its close relationship with its customers, since it monitors other sellers' sales to optimise the size and content of its own catalogue and to compete with the sellers in the market place on the most popular items. The market place enables Amazon to identify these items and stock adequate supplies in its own warehouses. Items with the slowest sales are "surrendered" to sellers on the market place, which means that these sellers incur the risk of stocking the slowest selling items, but still continue doing business as merchants, thus driving the sector as a whole through a technological innovation effort that gives Amazon a lasting competitive advantage[399].

4.1.1.2. Competition from individuals is an added factor in the shrinking tax base

The fact that business compete with individuals on the same market place can further exacerbate the shrinking of the tax base:

- Because of the transfer of sales volume from businesses to individuals who have few obligations to file and pay taxes, if any, for transactions between individuals. In this case, the individual providing the good or service is not theoretically required to declare the income earned unless the activity becomes a regular business. Even in the rare cases where an individual's transactions constitute a regular business, the tax administration has a hard time determining the income generated. Often the income is not declared because the individual is not aware of the requirement and the unit amounts involved are too small to warrant a tax audit. In any case, the personal income tax rate would probably be lower than the corporate income tax rate that a business would pay on the same income. In some cases, the transaction does not involve money, since a market place may be based on *bartering* of goods and services[400] or even use its own virtual currency.
- Because of lower prices imposed by competition from individuals – another effect of the growth of intermediary business models on tax revenue stems from the competition between businesses and individuals in the same market places. Amazon and Airbnb, for example, host offers from both individuals and businesses.

  Businesses often arrive in these market places much later than individuals, whose transactions have contributed to the growth of the market place and made it an essential venue[401]. Once a certain level of activity is reached in a market place, it

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"*just think for a moment about how many [individuals] there already are out there, and how many more there will be, to eat away at the profit margins of whatever Internet retailer you can imagine. It only costs them $150 a month and they can do it as a hobby!*" In other words, Amazon will never make it, because anybody can become Amazon and compete with it. In a way, this prediction was fulfilled, except the competition is now playing out in the marketplace run by Amazon. Thomas L. FRIEDMAN, "Amazon.you," *The New York Times*, 26 February 1999. http://www.nytimes.com/

[398] Meridith LEVINSON, "Amazon.com's IT Leader Leaving Huge Customer Service Infrastructure as Legacy," *CIO*, 17 October 2007. http://www.cio.com/

[399] Jeffrey P. BEZOS, Founder and CEO, Amazon.com, Inc., *Letter to Shareholders*, 2010. http://www.sec.gov/

[400] Originally, advertising bartering meant producing programmes for broadcast on American television channels in exchange for advertising screen time. This type of programming became known as "soap operas" since the programmes were produced by a detergent maker. Since then, the notion of bartering has been expanded and now means an exchange of advertising space for goods and services provided by the advertiser. The term is sometimes used simply to describe exchanges of advertising space.

[401] The following discussion is taken from an e-mail exchange between Paul GRAHAM, the head of a business accelerator Y Combinator (which gave us Airbnb), and Fred WILSON, the manager of a New York venture capital

becomes essential to have a presence there. For the market place operators, developing intermediation services between individuals is a strategy for gaining entry to the intermediation market between individuals and businesses. This was the pattern for YouTube, for example, which was initially a peer-to-peer video sharing application, but its use has become increasingly professional, with such partnerships as Vevo[402], and it is now an essential application for music and video professionals[403].

Competition from goods and services provided by individuals and the diversification of the goods and services available have tended to force businesses to cut their costs and margins. Once again, this erodes the corporate income tax base. An individual on a market place is willing to sell at a lower price to earn some extra spending money. In this case, the surplus is split between the consumer and the intermediary.

A more forward looking analysis must look at the *makers*[404] movement, for which Joël DE ROSNAY[405] coined a new French word "doueurs". "Do-it-yourself", "FabLabs" and "3D printing" are about to bring sweeping changes to the manufacturing industry. Militant thinkers and designers are currently leading this movement, which takes open source software as a precedent and is attempting to reproduce the same powerful effects of innovation, lower costs and economic development with regard to hardware. Intermediation models are likely to emerge in the future to leverage individuals' new capacity to produce tangible goods and, in a certain way, compete with the conventional manufacturing industry. A company like Amazon could seize the opportunity to transform its business model once again to free itself from the costs and the constraints inherent in running its warehouses and distribution circuit[406]. This will raise job issues[407], but once again, it will also have a direct impact on the corporate income tax base.

It is pointless to try to hold back the growth of intermediation and peer-to-peer economy. Regulations are sometimes used to this end, as was the case for Uber in several major cities of the United States[408] or for Coursera, a company developing a higher education

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fund. To illustrate what investors might talk about before making an investment in a business, Paul GRAHAM published this exchange on his blog with the permission of Fred WILSON and the founders of Airbnb.

"Paul Graham – Did they explain the long-term goal of being the market in accommodation the way eBay is in stuff? That seems like it would be huge. Hotels now are like airlines in the 1970s before they figured out how to increase their load factors. (…)

Fred Wilson – Airbnb reminds me of Etsy in that it facilitates real commerce in a marketplace model directly between two people. So I think it can scale all the way to the bed and breakfast market. But I am not sure they can take on the hotel market. I could be wrong. But even so, if you include short term room rental, second home rental, bed and breakfast, and other similar classes of accommodations, you get to a pretty big opportunity. (…)

Paul Graham – I know you're sceptical they'll ever get hotels, but there's a continuum between private sofas and hotel rooms, and they just moved one step further along it. This is after only a few months. I bet you they will get hotels eventually. It will start with small ones. Just wait till all the 10-room pensiones in Rome discover this site. And once it spreads to hotels, where is the point (in size of chain) at which it stops? Once something becomes a big marketplace, you ignore it at your peril."

Cf. Paul GRAHAM, « Airbnb », 17 March 2011. http://www.paulgraham.com/

402 Peter KAFKA, "Vevo's YouTube Deal Expires in Three Days. But the "Hulu for Music Videos" Site Won't Go Dark," *All Things Digital*, 7 December 2012. http://allthingsd.com/

403 John SEABROOK, « Streaming Dreams: YouTube Turns Pro », *The New Yorker*, 16 January 2012. http://www;newyorker.com/

404 Chris ANDERSON, *Makers: The New Industrial Revolution*, Crown Business, 2012.

405 Joël DE ROSNAY, *Surfer la vie : Vers la société fluide*, Les Liens qui Libèrent, 2012.

406 Theodore F. DI STEFANO, "Crystal Ball Gazing: Amazon and 3D Printing," *E-Commerce Times*, 18 October 2012. http://www.ecommercetimes.com/

407 "The digitisation of manufacturing will transform the way goods are made—and change the politics of jobs too," *The Economist*, 21 April 2012. http://www.economist.com/

408 Brian X. CHEN, "A Feisty Start-Up Is Met With Regulatory Snarl," *The New York Times*, 2 December 2012. http://www.nytimes.com

courses, in Minnesota. But such resistance is usually short-lived, since it is politically very difficult to resist the triple promise made by these operators: more choice and lower prices for consumers; extra revenue, which is particularly helpful in economically hard times, for individuals, who become suppliers on their market places; a spectacular innovation effort that, in itself, creates value for the economy as a whole[409]. This is why, rather than erecting regulatory obstacles, the priority should be on regaining the power to tax intermediaries' profits.

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All in all, multi-sided business models and the intermediation activities at their heart are having a triple impact that erodes the tax base: the intermediaries' earnings are *removed* from the tax base, since their profits are not usually declared in France; part of the tax base is *shifted* to individuals, whose earnings are not properly assessed by the tax administration; and the tax base is *shrunk* by the intermediaries' market power, which enables them to drive down prices for the benefit of consumers, resulting in smaller profits for the businesses present on their market places and declaring their taxable income in France.

Data produced by the users' activity play a major role in strengthening positions on intermediation markets. These data are used for five main purposes:

- Predicting changes in demand and adapting supply as far as possible;
- Matching supply and demand better, using auction systems or reputation measurement tools (eBay, Uber, Airbnb);
- Maximising both business volume and the intermediary surplus by matching prices to willingness to pay;
- Increasing the size of the market and transaction volume through recommendations and through the attraction of a market place that has become an essential venue;
- Overseeing and planning changes to the business model and diversification of the supply of services on the market place or related markets.

The intermediary is always inserted into the value chain at a strategic point, where it can forge a close relationship with users, inspire them to engage in activities that generate data and then leverage these data over the largest area possible. The disruption stemming from the arrival of digital economy intermediaries affects all sectors of the economy now.

4.1.2. The digital economy is spreading into all sectors

Marc ANDREESSEN has one of the highest profiles in the digital economy. He created the first Web browser (Mosaic, which became Netscape) and is now the respected and influential manager of the Andreessen-Horowitz venture capital fund[410]. In an article published in the *Wall Street Journal* in 2011, he stated:

> *"More and more major businesses and industries are being run on software and delivered as online services—from movies to agriculture to national defense. Many of the winners are Silicon Valley-style entrepreneurial technology companies that are invading and overturning established industry structures. Over the next 10 years, I*

[409] Mathew INGRAM, "Airbnb, Coursera, and Uber: the Rise of the Disruption Economy," *Business Week*, 25 October 2012. http://www.businessweek.com/

[410] The Andreessen-Horowitz investment fund was co-founded in 2009 by Marc ANDREESSEN and Ben HOROWITZ, former head of Opsware (sold to Hewlett-Packard in 2007). It holds or has held equity in Skype, Facebook, Groupon, Twitter, Zynga, Airbnb, Foursquare and many other flagship companies. The founders' respective blogs have tens of millions of readers and are some of the most influential sources in Silicon Valley and the digital economy in general. See http://blog.pmarca.com/ and http://bhorowitz.com/

expect many more industries to be disrupted by software, with new world-beating Silicon Valley companies doing the disruption in more cases than not."

The subject of the article is summed up in the headline: *"Why software is eating the world"*[411]. The digital economy is too frequently mistaken for a sector or an industry. As suggested by its voracious image, it is actually a *stand-alone principle* that is disrupting *every sector* of the economy and transforming many industries. For this reason, the digital economy is both disruptive for businesses that date back to the time before the digital revolution and difficult to apprehend for public policy in general, and for tax policy in particular.

4.1.2.1. Previously disrupted sectors

The sectors that have already been disrupted are the ones that lend themselves most readily to dematerialisation of the bulk of the value chain. These sectors are now highly concentrated and dominated by a handful of global players because of the low friction and network effects that are characteristic of the digital economy.

Historically speaking, advertising was the first sector to be transformed by the digital revolution. The free-content model initially chosen by most of the traditional media was then amplified by contributions from users, making it possible for the online advertising market to grow and specialise. There are actually two sides to this market: there is the *search* advertising side, linked to users' searches, and then there is the *display* advertising side linked to content or users' behaviour. Three trends have been observed on both sides of the market since the beginning: performance measurement, which is increasingly used to determine the amount advertisers pay; targeting, which adapts the advertisements shown to the user's profile and behaviour, with diversification of the models and retargeting; real-time, which gives rise to the famous ad exchanges, where advertisements are auctioned off in real time. The figure below hints at the number and diversity of players in the European display advertising market[412] – one segment of the market corresponds to activities related to "digital trust" (verification & privacy).

[411] Marc ANDREESSEN, "Why Software Is Eating The World," *The Wall Street Journal*, 20 August 2011. http://online.wsj.com/

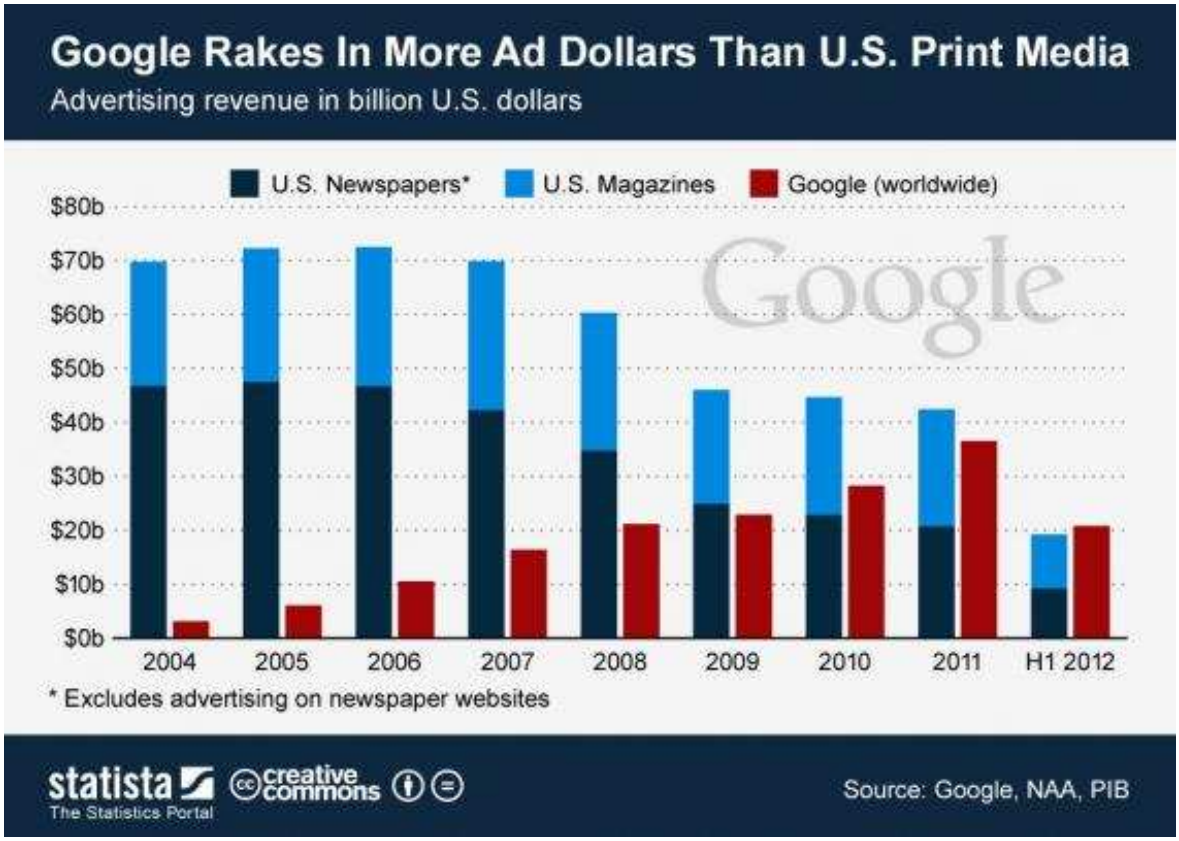
[412] IMPROVEDIGITAL, "2012 Display Advertising Ecosystem Europe," 2012. http://www.improvedigital.com/

2012 Display Advertising Ecosystem in Europe[413]

Google dominates the advertising market: after initially specialising in search advertising, it diversified into the display advertising market after acquiring DoubleClick and is now both an advertising agency and an advertising medium on both sides of the market. The figure below shows the shift of profits from the Websites of American print media to Google. As its market power as a global player on the advertising market grew, Google was able to increase its profit margins. Facebook and Twitter are also present in this market. Their business focuses on interactions between users and is complementary to Google's business. Amazon is developing an advertising business so that it can diversify into a market with higher margins than retail sales and to acquire a new lever for developing the ecosystem for its Kindle devices.

413 IMPROVEDIGITAL, *ibid.*

Changes in the respective advertising revenues of Google and American print media[414]



The next sector to be transformed after advertising was retail distribution, with some interaction between the two sectors within the framework of the affiliation model: companies that publish or host content provide retail firms with targeting and retargeting services. The online retail market was surrounded by great uncertainty a decade ago owing to the cutthroat competition between online merchants with razor-thin or even negative margins. This uncertainty has now dissipated and the online retail market is largely dominated by Amazon, which is offering shorter and shorter delivery times, pointing to a strategy of head-to-head competition with bricks-and-mortar retailers. By operating both as a market place and software platform, alongside its online shopping application, Amazon is virtually the only company to have overcome the difficulties associated with the thin margins in the sector and has even set itself up as the infrastructure for all of the innovative activities involving online shopping: group purchasing, community purchasing, peer-to-peer sales, peer-to-peer shopping recommendations. Historically, Amazon has specialised in selling cultural goods, but it is now setting itself up to compete with Apple on the market for services related to publishing, and e-books in particular.

Business models in cultural industries have also been deeply affected by the growth of the digital economy[415]**:**

- Back in the early nineteen-nineties, the music industry was the first to be affected, starting when burning CDs become easier, followed by the growth of illegal peer-to-peer music file sharing services, and finally the industry's problems finding a business

[414] Felix RICHTER "Google Rakes In More Ad Dollars Than U.S. Print Media," *Statista*, 11 December 2012. http://www.statista.com/

[415] Patrick ZELNIK, Jacques TOUBON, Guillaume CERUTTI, *Création et internet, Rapport au ministre de la culture et de la communication*, January 2010. http://www.culture.gouv.fr/

model that makes it possible to deal with illegal copying and ensure proper compensation for artists, producers and publishers[416]. Apple came up with the first sustainable business model for online music with the development of the iPod in 2004, the associated software, iTunes and mobile downloads[417].

Today, Apple dominates the online music market. In the second quarter of 2012, for example, Apple's share of the digital music market stood at 64% and its share of the total recorded music market in the United States stood at 29%[418]. The streaming music market is less rewarding than the download market. It emerged in 2009 with the spectacular growth of Spotify and Deezer. Smart radio is a smaller market, and the market leader, Pandora, is available in the United States only.

The music industry is now diversifying its business models, with locker and synchronisation services, payments for Internet clips, video game sound tracks and increasing integration into major social networking and cloud computing platforms. More importantly, the industry is recasting its value chain, with shifts in the rights negotiations between the different players, the reinvention of the music publishing business, as shown by the renaissance of BMG, and the development of crowdfunding, which promotes self-produced artists and has transformed the search for new talent.

- Disruption of the video industry, which includes both films and broadcasting, came later for two reasons. At first, the size of video files meant that the industry was less vulnerable to illegal copying and sharing and it was not until the capacities of telecommunications networks were substantially increased that bandwidth-hungry video applications could be developed. Secondly, the film industry managed to maintain and even increase ticket sales by constantly improving the cinema-going experience for audiences, thereby protecting a substantial share of its sales and profits.

  The increase in bandwidth then enabled YouTube, which was later acquired by Google, to take off and become the leading Internet video platform[419]. The increase in bandwidth also led to the development of video-on-demand services from Apple and Netflix, amongst others, but it also made the fortunes of Megaupload and other tools for illegal downloading and sharing of video files.

  Today, as television channels see their viewership and advertising revenues decline, the highest stakes in the video market seem to revolve around smart televisions. Internet access providers, television manufacturers and major companies, such as Google and Apple, that have developed smart television services, are staking out their preliminary positions on this market, where the adoption rate is still very low and the business models have not yet been clearly defined.

- The book publishing industry has undergone the most recent and the most rapid transformation. The e-book market was a minor market until 2010, when it was felt that the publishing business still had a few years left to learn from the difficulties of online music and embrace business models that created more value.

  But, in the interim, three major changes tipped the book publishing industry into the digital economy. The first was the agreement that Google and the publishing industry signed on digitising books. Google sent a first alert to the market by digitising a huge number of books, indexing their contents and making them available for its users' searches on Google Books. The second change, in response to Google's efforts to

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416 Fred GOODMAN, *Fortune's Fool: Edgar Bronfman, Jr., Warner Music, and an Industry in Crisis*, Simon & Schuster, 2010.

417 Walter ISAACSON, Steve Jobs, Simon & Schuster, 2011.

418 Robert ARCHER, "iTunes Dominates Download Market & Streaming Audio Grows," *CEPro*, 10 October 2012. http://www.cepro.com/

419 John SEABROOK, "Streaming Dreams: YouTube Turns Pro," *The New Yorker*, 16 January 2012. http://www;newyorker.com/

diversify into the book market, was Amazon's launch of the Kindle reader. Amazon wanted to anticipate the growth of the e-book market and use the same methods that enabled Apple to transform the music industry, so it launched its own device in order to develop an ecosystem for the distribution of e-books. Shortly after the first Kindle was launched, Apple developed the iPad, a tablet that can be used for reading e-books, as well as for surfing the Internet and using applications from the App Store. This established the new device, which was more sophisticated than an e-reader, as the preferred way to access e-books. Amazon, with Kindle Fire, Google, with Nexus, and Microsoft, with its Surface tablet, all fell into line with the new standard and caught up with Apple's innovation effort.

Today, the e-book market is posting exponential growth, representing 22% of sales in the United States publishing industry in the second quarter of 2012, compared to 14% one year earlier[420]. Amazon dominates the market, with Apple in second place, while Google, Microsoft and solutions operated by other players, such as Barnes & Noble, are now trailing far behind.

The travel industry has long since been transformed by the digital economy. Companies like TripAdvisor, Expedia and Booking.com have inserted themselves into the value chain as intermediaries enabling their users to plan their travel better and to reserve flights and hotel rooms. Google has started to compete with these companies by including hotels and other offers on its search results pages. The reservation management platforms like Amadeus or Sabre form the global software infrastructure for the air travel market. Companies like HipMunk have used design to reinvent the travel planning experience. And Airbnb, a company from the Y Combinator seed accelerator, has considerably expanded the size of the online travel market by attracting offers of rooms and residences rented by individuals, and, eventually, perhaps hotels to a single market place, where competition will become increasingly intense.

4.1.2.2. The Internet of things

The sectors that have already been transformed by the digital economy are those where development was based solely on "generic" devices, such as computers, smartphones and tablets:

- Telephones have been connected to the Internet since 2000, but it was not until they became "smart", with graphical browsers and applications developed by third-party developers, that they became the essential generic device for the development of a whole ecosystem.
- Similarly, after a few short years, e-readers now seem out-dated and, as shown with the substitution of the Kindle Fire for the Kindle, they are about to be overtaken by tablets[421], which are also generic devices and can, therefore, run Web browsers and a whole ecosystem of applications.
- Some doubt has already been expressed about the ability of smart televisions to establish themselves as generic devices. Smartphones and tablets could soon take their place as preferred Internet access points and even be used via the cloud to control smart televisions[422]. This has sweeping consequences for the value chain. The companies that control the control devices (Apple, Google and Amazon) will have an advantage over the companies that manufacture and connect television sets (television manufacturers and Internet service providers).

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[420] Source: Publisher Weekly.

[421] Greg BENSINGER, "The E-Reader Revolution: Over Just as It Has Begun?", *The Wall Street Journal*, 4 January 2013. http://online.wsj.com/

[422] Mat HONAN, "No One Uses Smart TV Internet Because It Sucks," *Wired*, 27 December 2012. http://www.wired.com/

The term "*Internet of things*" is used when mobile devices end up being connected to every object in our daily environment. For example, a rice cooker equipped with the Android operating system and controlled via a smartphone has just been developed and put on the market[423]. Mobile devices can be used as remote controls and for consulting the information gathered in this way. The number of connected objects is particularly high in different areas:

- In the area of energy and the environment, the Netatmo personal weather station shows the local weather conditions and, more specifically, the CO2 level. The Nest smart thermostat lets consumers control their energy costs by avoiding excessive consumption and by monitoring the temperature of their homes remotely. The device's sensors also enable it to detect the presence of a person in a room. The Nest was designed by an Apple veteran and its attractive design has made it a huge commercial success[424].
- In the area of health, objects produced by the French Withings company include some of the bestselling connected objects. The company's wifi scales measures weight, body mass index and percentage of body fat, and makes these data available for use by various applications. The company's blood pressure monitor connected to a mobile device can be used for in-home medical examinations[425]. Withings and other companies, such as Scanadu[426] are part of the growing Quantified Self[427] movement, which entails permanent tracking of the characteristics of the human body. The smart sensors are getting smaller and smaller and may soon be included in clothing for continuous "self-quantification".
- Generally speaking, connected objects are bringing about an industrial revolution as they are networked. All objects can be individually identified by using RFID (radio frequency identification) chips, and information about the product and the user could be stored on the Internet and updated continuously. Eventually, sensors could form networks by connecting to each other[428] for various applications and purposes: targeting advertising, customising services, increasing productivity through returns to scale, or even gathering information in disaster zones during emergencies.

The Internet of things expands the potential scope for the development of the digital economy to *every sector*, following paths that are now clearly understood:

- Making an object smart means putting software into it and connecting it to the network in order gather data and control it remotely. However, this does not make the object a *device.* As the example of smart televisions shows, generic devices, and smartphones and tablets in particular, are in the best position to be established as the preferred interfaces for using applications. But the existence of a smart object expands the scope of services provided by through the Internet by increasingly bringing the Internet into the real world. The Internet of things explains why the digital economy is "eating the

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[423] Cliff EDWARDS and Ian KING, "Google Android Baked Into Rice Cookers in Move Past Phone," *Bloomberg*, 8 January 2013. http://www.bloomberg.com/

[424] Sarah KESSLER, "Nest: The Story Behind the World's Most Beautiful Thermostat," *Mashable*, 15 December 2011. http://mashable.com/

[425] Jacqui CHENG, "Withings WiFi body scale review: weight data and cool graphs," *Ars Technica*, 28 January 2011. http://arstechnica.com/

[426] Robin WAUTERS, "Scanadu Raises $2M: "Check Your Body As Often As Your Email," *Techcrunch*, 8 November 2011. http://techcrunch.com/

[427] Emmanuel GADENNE, *Le guide pratique du* Quantified Self, FYP, June 2012. See also Henri VERDIER, «Connais-toi toi même (petite philosophie du #QuantifiedSelf) », 3 December 2012. http://www.henriverdier.com/

[428] Bernard BENHAMOU, « Les mutations économiques, sociales et politiques de l'Internet des objets », *Les Cahiers français*, n° 372, La Documentation française, Janaury-February 2013. http://www.ladocumentationfrancaise.fr/

world". It lets the digital economy transform sectors where the user cannot be connected solely through a generic device.

- In some cases, the object has its own control interface and looks like a device that is the preferred point of contact with the users. This model generates sales by diversifying the services provided through the device. To some extent, this was true for Kindle. But this strategy incurs the risk of running into competition later from an object that provides the same service *and* is generic (like the tablet, which has come to replace the e-reader) or can be controlled from a generic device (as is the case on the smart television market). It is impossible to provide access to an ecosystem as rich as the Internet from a device that is not adequately generic. This means that a non-generic object cannot be established as the preferred point of contact with users.
- Consequently, the business models for most smart objects are more ordinary. The object is sold, connected for use by means of a generic device, and it may come with some paid subscription services to ensure a steady flow of revenue. The fact that the object is sold makes it difficult to compare the business model to the models for purely intangible businesses, where users are drawn in by an initial promise of free services. Consequently, the business models for smart objects provide lower returns to scale for two reasons: the cost of reproducing the objects is higher than the marginal cost of each additional user of intangible services. It is hard to give the object away for free, unless it is part of a multi-sided business model and there have been few examples of such models to date[429].

Two trends in particular illustrate the specific economics of the Internet of non-generic things:

- Non-generic smart objects have a longer lifespan than generic devices: since they are connected, they can shift some of their computing workload to a remote server. To a certain extent, they can be updated without users having to replace them with a more recent and more powerful generation of objects. This means that the business models for smart objects cannot rely on users' purchasing successive generations of objects, or at least not with the same frequency as for computers and smartphones[430].
- Smart objects cost less and less to prototype and produce. Over the last few years, hardware has followed a similar pattern to that of open source software. The open hardware movement has cut manufacturing costs by such developments as the Arduino programming language, Fab Labs, which are workshops for fabricating objects born of the do-it-yourself movement, and 3D printing, which makes it possible to decentralise the fabrication of objects and bring it closer to users. In addition, there has been the spectacular crowdfunding movement, which, with such services as KickStarter, has enabled entrepreneurs to raise large sums to produce their first series, thereby greatly reducing market risks and fabrication costs.

With smart objects, the development dynamics of the digital economy are no longer bound by any real physical limits. Hardware will gradually be integrated into the specific digital economy business models, bringing it into value chains in all sectors where it takes more than merely connecting generic devices to provide the service. Even though it is slower and more uncertain than the development of the digital economy in the advertising industry and the media, the dynamics of the Internet of things promises to disrupt all sectors of the

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429 There is one precedent, which is telephone operators' and Internet service providers' subsidising (or rather offering payment in instalments) the purchase of mobile telephones or routers. Another theoretical example would be the subsidising of Nest thermostats by energy operators, which would supply their customers with the thermostats for free. The smart thermostats would generate such large additional energy savings that the operators could then use some of these savings produced by the widespread easing of demand. See http://www.nest.com/

430 Farhad MANJOO, "The World's Best Thermostat Just Got Better," *Slate*, 2 October 2012. http://www.slate.com/

economy. With the development of the Internet of things, the digital economy will eventually account for the bulk of profits in most sectors of the economy.

4.1.2.3. The digital economy is "eating" the world

The digital economy is eating all sectors of the economy in the same way. It inserts itself at a strategic point in the value chain, in contact with users, and leverages the data collected from the regular and systematic monitoring of their activity to conquer market share and cause of gradual shift of profit margins to itself. The Internet of things has unleashed the development of the digital economy in most sectors. Regulations will hinder this development in some cases. Competition laws could attenuate its development in other cases. But it is important for the purpose of making informed public policy decisions to consider that *no sector* will be spared the industrial disruption, profit shifting and potential losses of tax revenue in the long run. In each sector, there are pronounced trends or weak indications that hint at the shape of current or future transformations.

The digital economy has affected business models in the banking industry several ways. Peer-to-peer lending, a promoted by companies such as Lending Club, are taking on banks on the consumer credit market. Crowdfunding is taking on banks on the business loan market. More and more payment solutions that bypass the banking system are offering their services, such as PayPal or Square and the future development of payment solutions run by Google or Facebook. The introduction of virtual currencies, such as Bitcoin[431], represents an even more radical innovation. Retail banking services have been disrupted by the growth of online banking, as well as by the efforts of rapidly growing companies like Simple[432], which concentrate on innovation in customer service[433]. Banks themselves are setting up programming interfaces that leverage their customer data and give rise to application ecosystems, in addition to their information systems, that diversify the services that they offer. For example, in France, Crédit Agricole offers the Crédit Agricole Store[434], and Axa Bank has set up a documented API for developers[435].

The telecommunications sector, is an integral part of the digital economy, but it too has been disrupted by digital economy principles and dynamics:

- Telecommunications operators have been part of this economy from the start, since they operate its infrastructure. They also have special relationships with their Web-user customers and are seeking to develop services for these customers, such as access to content, but they are encountering stiff competition from the major digital economy companies. Skype, which has since been bought out by Microsoft, competed with the operators' telephony services very early on. It did this by undertaking large-scale development a technology that enables users to make telephone calls over the Internet without the need for any infrastructure other than the users' own computers.
- And yet, very few telecommunications operators have taken the step of transforming their telecommunications networks into programmable platforms in order to leverage

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431 Ruth WHIPPMAN, "Bitcoin: the hacker currency that's taking over the web," *The Guardian*, 12 June 2011. http://www.guardian.co.uk/

432 Jenna WORTHAM, "A Financial Service for People Fed Up With Banks," *The New York Times*, 8 January 2013. http://www.nytimes.com/

433 In the United States, professional tax preparers are gradually being put out of business by online applications that offer the same service automatically, and, more importantly, for free, in exchange for the collection of helpful data that can be aggregated and put to profitable use elsewhere. See Bruce UPBIN, "How Intuit Uses Big Data For The Little Guy," *Forbes*, 26 April 2012. See also Maribel LOPEZ, "3 Trends That Impact Every Business From Intuit's CEO," *Forbes*, 3 January 2013. http://www.forbes.com/

434 https://www.creditagricolestore.fr/

435 https://developer.axabanque.fr/

their customers' activities within an application ecosystem. In the United States Twilio developed a platform with an application programming interface (API) that can be used to develop applications that incorporate Web browsing, landline telephony and mobile telephony. This turned out to be a potential ecosystem that had not been tapped by telecommunications operators. In other words, it was a direct threat to their profits[436]. In early 2012, Twilio spurred AT&T to react by opening its own API, Appcelerator, after making the decision in 90 days. AT&T has since caught up in terms of the number of requests handled and the number of developers using its API[437].

- Furthermore, the wish expressed by such companies as Apple or Google to own the SIM cards installed in telephones is a sign of a shift in the distribution of value between network operators and over-the-top service operators, and a likely increase in the shifting of profits to the latter, which have more intense and more frequent relations with individual users than telecommunications operators do.

The automotive sector is one of the other sectors in the midst of transformation. Using a simple and attractive application, Uber has been an overnight success. It will be a keen competitor for taxi companies by offering the availability and quality of service that have been the preserve of customers of chauffeur driven limousines up until now. In some cities, the company has run into regulatory obstacles[438]. Waze, a collaborative GPS service, proposes to optimise driving routes in cities by relying exclusively on the community use data, including data for drawing the background maps. On the car hire market, the recent acquisition of ZipCar by Avis, the third ranking rental company on the global market, suggests changes that could result in professionals operating a market place for peer-to-peer car rentals[439]. Finally, the Google Car shows the way for carmakers to develop future smart cars, where users will have even more time to be on the Internet, since they will no longer even need to drive[440]. Google's strategic objective is to operate the control system for tomorrow's self-driving cars and to integrate them into both mobility information and management systems, with the advent of multimodal transportation[441], and into the advertising market that Google currently dominates. In response to these preliminary moves, Ford has just announced[442] that its own AppLink platform has been handed over to an open source community so that all carmakers can put it into their vehicles[443] in the hope that an application ecosystem emerges based on the platform provided by Ford.

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[436] Nick HUGHES, "Why Twilio Will Kill AT&T," *Business Insider*, 5 January 2012. http://www.businessinsider.com/

[437] Ingrid LUNDEN, "Move Over, Twilio: AT&T Integrates Speech, Messaging And Payment APIs Into Appcelerator's Developer Platform," *Techcrunch*, 18 October 2012. http://techcrunch.com/

[438] Brian X. CHEN, "A Feisty Start-Up Is Met With Regulatory Snarl," *The New York Times*, 2 December 2012. http://www.nytimes.com/

[439] Lydia DEPILLIS, "If Avis Is Smart, It Won't Stop With Zipcar," *The New Republic*, 4 January 2013. http://www.tnr.com/

[440] Tom VANDERBILT, "Let the Robot Drive: The Autonomous Car of the Future Is Here," *Wired*, 20 January 2012. http://www.wired.com/

[441] As suggested by Rob CONEYBEER, manager of the Shasta Ventures fund, a stream of self-driving cars in separate reserved lanes could travel faster and more safely. As long as each car carried several passengers, they could constitute a collective transit solution that is relatively efficient in economic and ecological terms. See Rob CONEYBEER, "Build an Autobahn from SF to LA, Not High-Speed Rail" and "Just Say No to High-Speed Rail," *280.vc*. http://280.vc/

[442] Damon LAVRINC, "Exclusive: Ford Wants to Create the Android of Automotive Apps," *Wired*, 7 January 2013. http://www.wired.com/

[443] The R-Link software platform recently launched by Renault is based on the Android operating system (from Google, but available as open source software). R-Link comes with its own application store and is another example of an attempt to compete with Google in the vast emerging market for smart cars. The main difference is that R-Link is not published as open source software, which means that it cannot be used by other carmakers, unless they sign a deal with Renault. See Jeremy LAIRD, "Renault R-Link: Everything you need to know," *TechRadar*,

Urban services are the focus of a substantial transformation effort by IBM, which is gradually reorganising its services around the *smarter cities* theme. IBM recently played a driving role in redeploying the water management network on the island of Malta[444], bringing it into direct competition with such companies as GDF-Suez and Veolia Environnement for a share of the profits on the urban services market. Following in the footsteps of IBM and Cisco, many companies in an emerging ecosystem are inventing smart devices that will help consumers improve tracking and management of their consumption of energy and water or help improve waste management. Ultimately, urban services management will learn to leverage local residents' activity to increase the potential for innovation, improve services and achieve savings of the taxpayers' money that finances them[445]. Future smart cities software platforms will generate more revenue if they become the media for applications containing geolocalised advertising[446].

In the energy sector, smart networks "powered" by digital innovations will revolutionise the production and consumption of energy. In the United States, the Green Button programme[447] provides home automation applications for energy savings with access to consumption data, which are collected by a connected smart meter, in order to assist consumers with the day-to-day management of their energy use and inform their decisions when purchasing electrical appliances. The Nest thermostat is a trailblazer for the connection of an everyday object and for the use of learning algorithms so that the thermostat can adapt automatically to the habits of the people living in the home. Recent press coverage reports that Google and Apple are competing to acquire R2, which has yet to announce the nature of its services, other than a mobile home automation application that provides remote control of the lights and heating in the user's home. In the longer term, smart electricity grids, made up of a multitude of connected electrical objects, could become the distributed energy production infrastructure of tomorrow[448]. Such an infrastructure would be more resilient than today's grids and probably would not have failed after hurricane Sandy hit[449].

Manufacturing is also being transformed by the digital economy, with the development of robotics and the introduction of smart and connected robots[450]. Several articles have hinted at Apple's intention to gradually relocate its production facilities closer to its customers through increased automation of its factories and greater reliance on robots. Amazon is also looking into robotics innovation to increase the productivity of its logistics. One move has been to acquire Kiva, a pioneer in the sector. Manufacturing as a whole has been disrupted by the digital economy in two ways. First, the development of connected smart robots will make factories less labour intensive and increasingly operated by remote control, which is bound to raise tax territoriality issues, since production on demand will gradually be melded with distribution, as supplying a good will increasingly be limited to providing the design and specifications for fabrication and assembly as close to the customer as possible. Secondly, the digital economy will bring manufacturing activities closer and

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23 October 2012. http://www.techradar.com/. On the same subject, see also Andrew McAfee, "Why My Next Car Needs to Be LESS Digital," *Andrew McAfee's Blog*, 26 November 2012. http://andrewmcafee.org/

444 Katie Fehrenbacher, "IBM: Welcome To Smart Grid Island," *GigaOM*, 4 February 2009. http://gigaom.com/. Shifra Mincer, "IBM: Learning To Speak Smart Grid In Malta," *Energy AOL*, 9 June 2011. http://energy.aol.com/

445 Usman Haque, "Surely there's a smarter approach to smart cities?" *Wired UK*, 17 April 2012. http://www.wired.co.uk/

446 McKinsey Global Institute, *Big data: The next frontier for innovation, competition, and productivity*, May 2011. http://www.mckinsey.com/

447 Carl Franzen, "White House Energy Program 'Green Button' Quietly Lurches Forward," *Talking Points Memo*, 7 December 2012. http://idealab.talkingpointsmemo.com/

448 Joël de Rosnay, *Surfer la vie : Vers la société fluide*, Les Liens qui Libèrent, 2012.

449 Tim Wu, "Power Is Finally Back in Manhattan. Here's How to Make Sure It Never Goes Out Again," *The New Republic*, 8 November 2012. http://www.tnr.com/.

450 Paul Krugman, "Rise of the Robots," *The New York Times*, 8 December 2012. http://www.nytimes.com/

closer to end customers by such means as "3D printing", accelerating the transition to fabrication and assembly by customers themselves. This opens up the possibility of using the data collected from the connection of 3D printers to leverage customers' activities to improve design and fabrication processes.

Fundamental aspects of education are being challenged by the digital economy. The level of debt incurred by students at American universities has become unsustainable[451] in recent years, leading to faster progress on replacing the current university model and increased innovation efforts in the digital economy to transform higher education[452]. More and more students want better degrees, but at a lower price: software makes it possible to meet these needs. Coursera, which was founded in 2012, has created a platform that makes university courses from all over the world available for free. The company has designed degree programmes around these courses, based on improvement of the courses by the students and interactions between students, which generate data. As of this writing, 1.9 million students have enrolled on the platform, illustrating the emerging notion of "*massive open online courses*". Coursera is in such direct competition with conventional universities that it has already run up against regulatory obstacles in Minnesota. However, pressure from Coursera and its users quickly overcame these obstacles[453]. For primary and secondary schools, Clever[454] has developed an API to facilitate connection of schools to the network, integration of existing databases and opening education system data access to pupils, parents and other stakeholders. Once again, this unleashes a potential for innovation that is likely to give rise to an ecosystem of educational applications.

The healthcare sector could achieve huge productivity gains from the digital economy. The *Quantified Self* concept consists of enabling individuals to measure their personal data, particularly health-related data, and track changes over time to learn from them and respond to them through behavioural changes. Innovations are transforming the practice of medicine, facilitating self-diagnosis and self-medication through the use of connected devices, like the ones developed by Scanadu. Other innovations focus on health insurance reimbursements and optimising courses of treatment, with the Blue Button programme offered to US army veterans, for example. At present, these innovations have the most promising prospects for controlling government healthcare spending in the long term. Consequently, the digital economy is one solution to one of the most serious problems, which is the deficit of national health insurance systems that is burdening public finances in developed countries. Investments in the United States are much greater since these innovations hold out the possibility of saving billions of dollars in the government's healthcare spending.

Even government is concerned. Driven by the desire to improve the services provided to citizens, the conviction that it has a role to play in starting an innovation ecosystem and the need to reduce costs, government could gradually come round to the strategy of *government as platform* and invite application developers to operate public services jointly with the government in a more innovative way that is able to meet the specific needs of citizens better[455]. Estonia's government is one of the most advanced in this area, with its public

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[451] Kevin CAREY, "A Radical Solution For America's Worsening College Tuition Bubble," *The New Republic*, 10 January 2012. http://www.tnr.com/

[452] Gregory FERENSTEIN, "Move Over Harvard And MIT, Stanford Has The Real 'Revolution In Education,'" *Techcrunch*, 9 May 2012. http://techcrunch.com/. Ariel DIAZ, "Re-thinking education for the Internet Age," *Pando Daily*, 31 October 2012. http://pandodaily.com/

[453] Max EHRENFREUND, "Coursera and Minnesota: What Was All The Fuss About?" *The Washington Monthly*, 22 October 2012. http://www.washingtonmonthly.com/

[454] Rip EMPSON, "Twilio For Education Data, Clever, Lands $3M From Kevin Rose, Mike Maples & Ashton Kutcher, Now In 2K Schools," *Techcrunch*, 22 October 2012. http://techcrunch.com/

[455] Tim O'REILLY, "Gov.2.0: It's All About the Platform," *Techcrunch*, 4 September 2009. http://techcrunch.com/. Tim O'REILLY, *Government as a Platform*, O'Reilly Media, 2010. http://ofps.oreilly.com/

software platform e-Estonia[456]. In the United States, after completing the first step of putting a portal online http://www.data.gov/, the White House recently published a digital strategy that sets out the principle of making Web APIs the default so that developers can mash up software resources (data and computer programs) from federal agencies with their applications[457].

It is the height of irony that venture capital, the main source of financing for the digital economy, is also being disrupted by this economy. Unlike market financing, venture capital funds have done little to leverage data in their investment activities, preferring frequent interactions with entrepreneurs to help them choose good investments. But data-based venture capital models are now starting to emerge. The 500startups fund is testing a model for early investment in a large number of companies, striving to replace face-to-face discussions with increasingly collective interactions between investors and entrepreneurs at organised events, and, most importantly, with massive and systematic data collection to measure the performances of the companies in the fund's portfolio, supporting their growth and using only quantitative data and analysis to guide later investment choices[458]. In a same vein, the Startup Genome Project collects financial and operating data provided voluntarily by a large number of startups (10,000 as of today), in exchange for giving them an opportunity to compare themselves against samples of startups and to improve management of their "traction" through a performance-based process. Aggregated data are then sold to venture capital funds so that they can assess the companies in their portfolios and inform their investment decisions[459].

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The digital economy is not a sector. Nor is it limited to a few sectors. The changes that it brings about, including changes in employment, purchasing power and the tax base, will gradually spread to all sectors of the economy and have huge consequences.

4.2. The consequences of inadequate taxation are catastrophic for the economy

4.2.1. The digital economy is destroying jobs without generating any extra tax revenue

The digital economy is a major factor for productivity gains in all sectors of the economy in two ways.

- First, technology itself contributes to productivity gains. Organisations' use of information technology has led to automation of certain tasks, reallocation of human resources, optimisation of processes and the elimination of certain purchases. However, it is difficult to measure the contributions that these technologies have made to productivity gains in the economy. As the Nobel laureate for economics, Robert

[456] *Cf.* http://e-estonia.com/. See also Peter Thomas KEEFER, "How Estonia Became a World Leader in Digital Governance," *The Aspen Institute*, 25 October 2012. http://www.aspeninstitute.org/

[457] THE WHITE HOUSE, *Digital Government: Building a 21st Century Platform to Better Serve the American People*, May 2012.

[458] Paul SINGH, "Moneyball: A Quantitative Approach to Angel Investing," *500startups*, August 2012. http://fr.slideshare.net/

[459] They are also used to publish a report comparing the innovation ecosystems that gave rise to the startups in the database. See Rip EMPSON, "Startup Genome Ranks The World's Top Startup Ecosystems: Silicon Valley, Tel Aviv & L.A. Lead The Way," *Techcrunch*, 20 November 2012. http://techcrunch.com/

SOLOW, famously quipped in 1987, "*You can see the computer age everywhere, but in the productivity statistics*"[460].

A few years later, Erik BRYNJOLFSSON from the Sloan School of Management at MIT, highlighted four reasons why the productivity effects of computer investment by companies do not show up in the statistics (see figure below)[461]. In a 2003 article in the *Harvard Business Review*[462], Nicholas G. CARR formed the hypothesis that information technology had become cheaper and easier to deploy, meaning that it was no longer a factor for productivity gains per se; that IT only boosted productivity when combined with other resources in a business model designed to leverage IT by using a competitive advantage.

Why computers have not improved corporate productivity[463]

(Sidebar:) **Why Haven't Computers Measurably Improved Productivity?**

1. Measurement Error: Outputs (and inputs) of information-using industries are not being properly measured by conventional approaches.
2. Lags: Time lags in the pay-offs to IT make analysis of current costs versus current benefits misleading.
3. Redistribution: Information technology is especially likely to be used in redistributive activities among firms, making it privately beneficial without adding to total output.
4. Mismanagement: The lack of explicit measures of the value of information make it particularly vulnerable to misallocation and overconsumption by managers.

- A larger productivity increase stems from the gradual transformation of application users into auxiliaries for the production of goods and services. Their "free labour" has produced exponential productivity growth, since this growth is proportional to the network effects generated by the large number of users of an application or of a platform hosting several applications. In other words, user-generated data, rather than the technology itself, are what lie behind the productivity gains in the digital economy.

The productivity gains from the growth of "free labour" are already visible in the digital economy. Google's profit margin, the valuation of Facebook for its IPO, Amazon's market shares and Apple's cash pile testify to the return on these companies' business activities. Digital economy companies may be very capital intensive, but they have relatively few employees relative to their revenue, the number of their customers and users or their market capitalisation, which suggests that they have achieved substantial gains in labour productivity. Most importantly, these companies trigger sweeping price cuts in every market that they enter, even resulting in a number of services being offered for free, thereby

[460] Robert SOLOW, "We'd better watch out," *New York Times Book Review*, 12 July 1987.

[461] Erik BRYNJOLFSSON, "The Productivity Paradox of Information Technology: Review and Assessment," *Communications of the ACM*, December 1993. http://ccs.mit.edu/

[462] Nicholas G. CARR, "IT Doesn't Matter," *Harvard Business Review*, May 2003. http://fr.scribd.com/

[463] Erik BRYNJOLFSSON, *ibid.*

increasing the consumer surplus. This surplus, which is difficult to measure, distorts productivity calculations.

It should be noted that, contrary to the precedents in economic history, these productivity gains have not led to a net increase in employment. The first signs of this were seen with the economic recovery following the 2001 recession[464]. More recently, economists have shown an apparently structural decoupling of rising productivity from stagnant job creation in the United States[465]. The decoupling can be attributed to various factors: changes in taxation and government policies in general, globalisation and offshoring, along with changes stemming from the growth the digital economy[466]. These changes include the spread of digital technologies and, once again, the "free labour" arising from the enrolment of users in the production process enabled by these technologies.

Decoupling of productivity from employment in the United States[467]

Source: BLS

[464] John B. JUDIS, journalist with the American weekly, *The New Republic*, noted in 2011 that the economic crisis of 2008 had, "*the same unique causes and the same initial trajectory*" as the 1929 recession. "*Both downturns were triggered by a financial crisis coming on top of, and then deepening, a slowdown in industrial production and employment that had begun earlier and that was caused in part by* ***rapid technological innovation****. The 1920s saw the spread of electrification in industry; the 1990s saw the* ***triumph of computerization in manufacturing and services****. The recessions in 1926 and 2001 were both followed by 'jobless recoveries'."* See John B. JUDIS, 2011, "Doom! Our Economic Nightmare is Just Beginning," *The New Republic*, 14 September 2011. http://www.tnr.com/

[465] Jared BERNSTEIN, "The Challenge of Long Term Job Growth: Two Big Hints," 5 June 2011. http://jaredbernsteinblog.com/

[466] Erik BRYNJOLFSSON and Andrew MCAFEE, "Jobs, Productivity and the Great Decoupling," *The New York Times*, 11 December 2012. http://www.nytimes.com/

[467] Jared BERNSTEIN, *ibid.*

This year, Marc GIGET from the Paris Club of Innovation Managers[468] presented data[469] showing the weakness of job creation in the digital economy proper. In the United States, instead of the 2.7 million new jobs predicted by the Bureau of Labor Statistics (BLS) in in 1998, the digital economy shed 68,000 jobs, even before the crisis of 2008. In 1998, the Americans expected that technical progress would help concentrate high-value-added jobs in the United States, such as engineering, advertising and design jobs, even if low-value-added blue-collar jobs moved offshore to developing countries or workers were replaced by machines in fully-automated factories. However, these creative jobs only represent at most 7% to 8% of jobs and their growth has not come close to offsetting the losses of production jobs. In 1998, the BLS predicted that 1.87 million jobs would be created in computer services by 2008, but the actual number was barely more than 500,000. In the communications sector, productivity gains wiped out 150,000 jobs, whereas the BLS had predicted the creation of nearly 300,000 new jobs. Companies without factories, or *Fabless* companies are a non-starter in terms of job creation.

Weak job growth in the digital economy[470]

American predictions for high-tech jobs turned out to be wrong

Actual change

Predictions for 1998 to 2008

Service job creation fell far short of predictions and did not offset production job losses

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[468] The Paris Club of Innovation Managers is managed by Institut européen de stratégies créatives et d'innovation, which does constant research on innovation in all its forms throughout the world and designs and produces training courses in innovation culture and implementation for business executives, government agencies, research organisations and universities. http://www.directeur-innovation.com/

[469] Marc GIGET, « Réflexions autour de l'innovation industrielle », *Le numérique dans la réindustrialisation*, Rencontres de Cap Digital, 27 March 2012. http://capdigital.webconf.tv/

[470] Marc GIGET, *ibid*.

Instead of 2.7 million new jobs being created, 68,000 jobs were destroyed (before the crisis)

It is understandable that the growth of "free labour" has had effects both in terms of productivity gains and the substitution of users' labour for that of employees. The development of the digital economy has led to three noteworthy macroeconomic effects: lower prices that increase consumers' purchasing power, productivity gains that promote economic growth and job destruction stemming from the substitution of users' "free labour" for employees' wages, payroll taxes and contributions, and other assets. The labour factor has been squeezed out by the data generated by the activity of the users of online applications. Amazon, with a similar sized operation and revenue that was only half that of the Carrefour group in 2011, had only one-sixth as many employees[471].

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The growth of the digital economy holds great promise. But it also has asymmetrical effects on domestic economies. Just as there are not yet any tax rules to ensure that doing business with users in one country will generate tax revenue for the government of that country, there are no economic rules to ensure that technical progress systematically leads to new jobs:

- The large digital economy companies contribute to job creation. Google funded a report by McKinsey highlighting the fact that the digital economy was the source of one quarter of the new jobs created in France since 1995[472]. Meanwhile, Facebook commissioned a report by Deloitte estimating the value added that Facebook generates directly and indirectly at 15.3 billion euros and the number of jobs that Facebook finances in the European Union at 232,000[473]. In the same vein, a report by Copenhagen Economics published at the beginning of 2012 stressed that the major digital economy applications classified as hosts, within the meaning of the 2000 Electronic Commerce Directive, generate an economic surplus of some 300 billion euros each year in the European Union[474].
- But industrial policy, research and innovation grants, social welfare and education must also play a role in coping with such a radical transition as the one brought about by the development of the digital economy. It is up to governments to implement suitable public policies. Before the digital revolution, productivity gains in a country generated additional tax revenue, which was used to finance such policies. After the digital revolution, the main players' business models and strategies deprive governments of the additional revenue generated by productivity gains. This is why tax law needs to be updated urgently: *the digital economy must contribute to financing the policies to cope with the transition brought about by its growth.*

All in all, the impact of the digital revolution calls for an industrial policy where taxation of the digital economy plays a dual role. Tax rules can be used to re-establish fair competition between companies located in France and those located in other countries. They can be used to have all digital economy companies contribute to financing the public policies

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471 The Carrefour group reported sales of 81,271 billion euros in 2011, with 412,464 employees. Meanwhile, Amazon reported sales of 48.07 billion dollars in 2011, with 69,100 employees in the second quarter of 2012. See http://en.wikipedia.org/

472 GOOGLE INC, in collaboration with MCKINSEY & COMPANY, *Impact d'Internet sur l'économie française, Comment Internet transforme notre pays*, March 2011. http://www.mckinsey.com/

473 FACEBOOK INC, in collaboration with DELOITTE, *Measuring Facebook's Economic Impact in Europe*, January 2012. http://www.deloitte.com/

474 EUROPEAN DIGITAL MEDIA ASSOCIATION, in collaboration with COPENHAGEN ECONOMICS, *Online Intermediaries: Assessing the Economic Impact of the EU's Online Liability Regime*, January 2012. http://www.copenhageneconomics.com/

made necessary by the impact of their development on the domestic economy. The point is not merely developing special taxation for a specific sector or industry. It concerns the domestic economy as a whole, including jobs, purchasing power, competitiveness and financing for social welfare and public services.

The conclusion is not that the digital economy does not create any jobs. It is that it does not create jobs unless there is an aggressive industrial policy with two complementary purposes: *promoting* organic growth of the digital economy in France[475] and *organising* the dissemination of the resulting productivity gains to the rest of the economy, more specifically by removing barriers to entry to the use of data as a key flow of the digital economy[476]. Tax policy is one instrument of such an industrial policy. It can be used to promote fair competition between digital economy companies, channel their R&D efforts and *generate the tax revenues that the government needs to cope with this transition.* This calls for an industrial policy aimed at French startups.

4.2.2. The digital economy has made the conventional conception of R&D obsolete, which is hampering innovation by French companies

The foundations of government policies to subsidise research and innovation have been undermined by the changes brought about by the digital economy. The international standard for defining R&D activities is set out in the *Frascati Manual*[477]. The OECD first published the Manual in 1963 for the purpose of standardising the measurement of human and financial resources allocated to R&D. It makes distinctions between basic research[478], applied research[479] and experimental development[480]. The *Frascati Manual* was initially compiled for the purposes of standardising statistics and it has inspired the criteria used in France to identify companies' expenditure that is eligible for the research tax credit[481]. It is also used to qualify companies as New Innovative Companies or for various R&D or innovation aid schemes. European law lays down the ground rules for government aid[482]. It requires the use of unequivocal definitions to identify the eligible companies and projects and that the share of the relevant expenditure covered by the aid is never more than half. More specifically, R&D should be distinct from innovation[483] and production[484].

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[475] For more on this subject see Paul GRAHAM, "How To Be Silicon Valley" and "Why Startups Condense in America," May 2006. http://www.paulgraham.com/

[476] Paul KRUGMAN, Nobel laureate for economics, pointed out in a recent editorial how the growing gap between compensation of capital and compensation of labour and weak job growth were due to *both* technological progress *and* the dominant positions of large corporations, which constitute barriers to entry and hamper innovation. See Paul KRUGMAN, "Robots and Robber Barons," The New York Times, 10 December 2012. http://www.nytimes.com

[477] OECD, *Frascati Manual, Proposed Standard Practice for Surveys on Research and Experimental Development,* 2002. http://browse.oecdbookshop.org/

[478] "*Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view*."

[479] "*Applied research is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective*."

[480] "*Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed*."

[481] INSPECTION GENERALE DES FINANCES, Rapport de la *Mission d'évaluation sur le crédit d'impôt recherche*, n° 2010-M-035-02, September 2010. http://www.igf.finances.gouv.fr/

[482] See Articles 107 to 109 of the Treaty on the Functioning of the European Union.

[483] In the Oslo Manual published by the OECD in 1997 defines innovation activities as, "*all those scientific, technological, organisational, commercial and financial steps, other than R&D, necessary for the implementation of new or improved products or services and for the commercial use of new or improved processes. These include the acquisition of disembodied technology and know-how, acquisition of embodied technology, tooling up and industrial*

After the digital revolution, R&D moved closer to the users, just like all of companies' other activities. In other words, users have become auxiliaries in R&D, just as they have in the production chain. More specifically, users contribute to digital economy companies' R&D through the data generated by regular and systematic monitoring of their activity. Organisations collect these data and use them for R&D, as shown in the work of Eric VON HIPPEL on the "*consumer-innovator*"[485], Erik BRYNJOLFSSON on the "*extroverted firm*"[486] or Henry CHESBROUGH on "*open innovation*"[487]. Meanwhile Norbert ALTER puts forward the idea that an innovative company is increasingly defined by its "*capacity to share*"[488].

However, it is not clear how compatible this R&D involving users is with the definitions in the *Frascati Manual.*

- *On the one hand, the* Manual *does not count "systems or programmes that were publicly available prior to the commencement of the work"*[489] *as R&D.* In this, the *Manual* seems to prefer the idea of R&D closed off inside the organisation, remote from users and even characterised by the absence of interaction with users. However, R&D in the digital economy is often carried out in contact with users (it is part of the growth hacking rationale and a guiding principle for the notion of a lean startup). Applications can be made available to users or an existing application already in use can be taken as a starting point for R&D purposes.
- On the other hand, several parts of the *Manual* suggest a broader definition of R&D that includes:
  - *"Development of information technology at the level of operating systems, programming languages, data management, communication software and software development tools".*
  - *"Development of Internet technology" (sic).*
  - *"Software development that produces advances in generic approaches for capturing, transmitting, storing, retrieving, manipulating or displaying information".*
  - *"Experimental development aimed at filling technology knowledge gaps as necessary to develop a software programme or system".*
  - *"R&D on software tools or technology in specialised areas of computing (image processing, geographical data presentation, character recognition, artificial intelligence and other areas)."*

It is difficult to reconcile these contradictions and come to an unequivocal conclusion about the exact limits of R&D in the digital economy. The tax administration has taken a stab at it by issuing a tax instruction that gives many specific examples, rather than setting

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engineering, industrial design (not classified elsewhere), other capital acquisition, production start-up and marketing for new or improved products."

[484] Production and related technical activities cover, "*industrial preproduction and production and distribution of goods and services and the various allied technical services in the business enterprise sector and in the economy at large, together with allied activities using social science disciplines, such as market research."*

[485] Eric VON HIPPEL, Susumu OGAWA and Jeroen P.J. DE JONG, "The Age of the Consumer-Innovator," *MIT Sloan Management Review*, Autumn 2011. http://web.mit.edu/evhippel/

[486] Prasanna TAMBE, Lorin M. HITT and Erik BRYNJOLFSSON, "The Extroverted Firm: How External Information Practices Affect Innovation and Productivity," to be published in *Management Science*, 2011. http://ebusiness.mit.edu/erik/

[487] Henry CHESBROUGH, *Open Innovation: The New Imperative for Creating and Profiting from Technology*, HBS Press, 2003.

[488] Norbert ALTER, « Les trois piliers de l'innovation », *ParisTech Review*, 11 January 2013. http://www.paristechreview.com/

[489] Inspectors are willing to consider that a company attempting to "rediscover" a technology that already exists in another country or that another company already uses is eligible for the research tax credit.

down general principles, and does little to clear up the uncertainty[490], especially since digital economy startups may also be eligible for a similar, but separate, aid scheme for New Innovative Companies. This troubling situation leads us to point out three problems:

- Difficulties with the interpretation and enforcement of tax rules on R&D are in themselves an obstacle to growth and innovation in the digital economy. A substantial share of the innovation in this economy depends on startups that have little advice or poor advice, or even no advice at all, from business services professionals. Their shaky finances at this point in their development mean that they rely heavily on government aid schemes for R&D. Therefore it is crucial for them to be able to apply for the grants quickly, by means of simple procedures that do not require much in the way of human and financial resources[491]. As Yochai BENKLER at Harvard University points out, "*low-cost experimentation and adaptation on a mass scale, underwritten by the ease of cheap, fast implementation and prototyping, (…) have been more important to innovation and growth in the networked economy than models of innovation based on higher-cost, more managed innovation aimed at planning for predictable, well-understood returns. Judges and legislators who want to increase growth (…) in this unusual space should therefore orient their efforts towards minimizing institutional barriers to experimentation and implementation.*"[492]

  The difficult application process for these schemes leads to unfair advantages for some companies. In the event of a dispute with the administration, an application for the research tax credit will first be examined by the experts at the Ministry of Finance, to assess its compliance with tax laws and the terms of the *Frascati Manual*. If there are any doubts, academic experts appointed by the Minister for Research will assess the scientific rigorousness of the project. There are very few new companies that have the writing skills needed to satisfy both sets of experts. Poorly written applications may be rejected, even though the spirit and nature of the projects should have made them not only eligible, but also immediately convincing for experts who are theoretically abreast of the state of the art… *they are either experts or they are not*.
- The government has trouble talking to digital economy companies about a better definition of R&D. These companies are found in every sector and they are transforming every industry, which means that they are rarely represented as digital economy companies. The digital economy companies of tomorrow cannot make their voice heard in the public debate or by decision-makers because do not exist yet[493]. Unlike their American counterparts, the French venture capital funds that finance the digital economy do not have their own trade association[494] or any independent power

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490 DIRECTION GENERALE DES FINANCES PUBLIQUES, « Instruction n°4 A-3-12 », *Bulletin officiel des impôts*, 21 February 2012. http://www.minefi.gouv.fr/

491 The difficulties involved in interpreting tax law as regards R&D explain the rising fortunes of accounting firms and law firms, as well as a service industry dedicated to helping companies apply for government R&D and innovation aid. The conditions under which these services are provided and paid for are legally doubtful and their net contribution to the growth of the digital economy is, to put it mildly, far from being proven.

492 Yochai BENKLER, "Growth-Oriented Law for the Networked Information Economy: Emphasizing Freedom to Operate Over Power to Appropriate," *Rules for Growth: Promoting Innovation and Growth Through Legal Effort*, Ewing Marion Kaufman Foundation, 2011. http://www.kauffman.org/. For more detail about this aspect, see also behavioural economics research, such as Cass R. SUNSTEIN and Richard H. THALER, *Nudge: Improving Decisions About Health, Wealth, and Happiness*, Penguin Books, 2009.

493 France Digital, founded in 2012, is the only association that aims to have both digital economy companies and the venture capital funds that finance them belong to the same organisation. http://www.francedigitale.org/

494 The National Venture Capital Association was founded in the United States in 1973. In France, venture capital funds are represented by a growth investors association, *Association française des investisseurs pour la croissance* (AFIC), which also represents other types of investors (development capital, buyout capital and turnaround capital). See http://www.nvca.org/ and http://www.afic.asso.fr/

to influence the debate[495]. Even though they are responsible for certifying companies, the competitiveness clusters specialising in the digital economy have not been asked by the government to help clarify the criteria for defining R&D or to help apply these criteria to individual companies applying for grants, even though they already do so for joint R&D projects.

- In its texts and practices, the government adopts the most restrictive and narrowest interpretation possible of the notion of R&D. It tends to prefer an approach to R&D that is in line with practices in more conventional and better-understood industries and sectors. As a result, there is a bias in favour of R&D that appears to be more technological, more administered, organised into projects and sub projects, shut up inside organisations and remote from users. However, this is not the pattern for R&D in the digital economy, which is radically different. It systematically seeks contact with users in order to leverage their activity, iterations are made quickly and existing resources are frequently combined in new ways[496]. In the digital economy, R&D is open, dynamic and crosscutting, and it is not limited to technology at all. For digital economy startups, experience and interface design, business models, data analysis, strategy and "traction" are just as critical areas for R&D as algorithms, displays, software architecture or real-time operation.

Introducing a competitiveness tax credit would undoubtedly help to overcome some of these problems. But, rather than extending the research tax credit to innovation, the key issue is still to review the very concept of R&D in the digital economy:

- The theoretical basis for the research tax credit is the idea that the knowledge acquired from R&D "*is usually impossible to own entirely because it is intangible and easily shared ("conventional" argument), as are its indirect long-term macroeconomic effects ("evolutionist" argument).* Government R&D aid is aimed at overcoming a market failure stemming from the fact that "*no institution, or even any instruments to protect intellectual property, such as patents, can entirely control the external effects, meaning interactions outside the market"*[497].
- In the digital economy, this theoretical foundation should lead to a review of the boundaries of R&D and its extension from technology to business models and design, for at least three reasons:
  - Business models and design are decisive criteria for explaining the success or failure of digital economy companies. Yet, they are subject to a similar market failure to the one affecting knowledge acquired from R&D: there is nothing that enables a company to own all of the effects. Once the activity starts, business models and design, no matter how radically innovative they are, can be imitated by rivals to a large extent. This is particularly true for large companies that have enough resources to counter the entry of a "disruptive" new competitor on the market very quickly[498].
  - Another differentiation criterion is "traction", the capacity to forge close relationships with users very quickly and then leverage the data gathered from

[495] For more on this subject, see Sarah LACY, "The eerie silence about carried interest amid the fiscal cliff hysteria," *Pando Daily*, 18 December 2012. http://pandodaily.com/

[496] This approach is something like hacking, which is fundamental to the business culture of the digital economy. "*A 'hack' denotes an ingenious combination, an invention that nobody thought of before, that nobody thought possible with the available resources, a shortcut that gets the job done more quickly and more elegantly."* See Mathieu TRICLOT, *Philosophie des jeux vidéo*, Zones, 2011.

[497] Andrea ZENKER and Jean-Alain HERAUD, "Le Crédit Impôt Recherche en débat : un éclairage franco-allemand," *Bulletin de l'Observatoire des politiques économiques en Europe*, Université de Strasbourg, Winter 2009. http://www.opee.unistra.fr/

[498] Scott D. ANTHONY, "The New Corporate Garage," *Harvard Business Review*, September 2012. http://hbr.org/

regular and systematic monitoring of users' activity to improve the goods and services provided and to win a bigger market share even sooner. The available literature[499] provides ample documentation of the imperative need to get to market as soon as possible. This enables a company to protect its R&D through rapid execution, but also, and more importantly, to enhance its R&D with contributions from users[500]. But early arrival on the market makes the business model and the experience design that much more vulnerable to imitation by competitors. The emerging new discipline called *growth hacking* suggests the increasingly technological dimension of marketing and commercial development.

- The speed with which applications are brought to market in the digital economy stems from the radical changes in the role of technology in value creation. Most disruptive technologies from the digital economy were produced or developed by communities of developers. The dominant role of free software is one of the factors contributing to the considerable decline in the cost of technology[501]. The fact that technological R&D has shifted from inside organisations to outside means that companies are focusing their R&D efforts in other fields, including business models, design (closely linked to data collection), "traction" and processing the data from regular and systematic monitoring of users' activity[502].

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Our obsolete conception of R&D, compared to the realities of the digital economy, is a strategic threat to competitiveness. Government R&D aid schemes and their underlying concepts have a decisive influence on the specialisation of our companies and their capacity to find their way in the digital economy. The bias stemming from an obsolete conception of R&D explains why so few French companies are major players in this economy. Rather than encouraging them to create innovative business models, design, data collection and processing, or application programming interfaces (APIs), the current schemes limit them to making real or simulated technological innovation efforts, which have become pointless in these days of free software and software platforms[503], and prevent them from making "traction" a priority and from using the data generated by users' activity.

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499 Eric RIES, *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Crown Business, 2011.

500 This leads to the powerful concentration seen in digital economy markets. See VERSION ONE VENTURES, "Traction is the New IP," 18 October 2012. http://versiononeventures.com/

501 There are other factors, including the falling cost of microprocessors ("Moore's law") and increasing availability of large corporations' technological resources through software platforms, such as Amazon Web Services, Microsoft Azure or Google Cloud Platform.

502 This means that R&D in the digital economy, which is largely based on the use of data (modelling, optimisation and learning), is more like R&D in the financial sector than like R&D in the automotive, pharmaceutical or food sectors.

503 This bias is exacerbated by a pronounced slant towards patents, which are largely pointless in the digital economy and under French law. Functional designs cannot be patented in France, contrary to what the famous example of Amazon's patent on one-click shopping seems to suggest. This example is misleading, because it is based on American intellectual property law. Computer code cannot be patented, since it is protected by copyright and, in practice, it is largely produced by communities of free software developers or available from platforms at little cost. The debate in the United States about patents in the digital economy has been fuelled by the recent dispute between Apple and Samsung, as well as recurrent controversy about the practices of "patent trolls", which are companies with vast portfolios of patents that derive their revenue exclusively by suing other companies for allegedly infringing their intellectual property rights. For more on this subject, see Jim KERSTETTER and Josh LOWENSOHN, "Inside Intellectual Ventures, the most hated company in tech," *CNET*, 21 August 2012. http://news.cnet.com/. For a more general discussion of patents in the digital economy, see Vivek WADHWA, "Why We Need To Abolish Software Patents," *Techcrunch*, 7 August 2010. http://techcrunch.com/. VERSION ONE VENTURES, "Traction is the New IP," 18 October 2012. http://versiononeventures.com/

The poor showing of French companies in the digital economy has major macroeconomic effects. Growth, productivity, job creation, purchasing power and, of course, tax revenue all depend on correcting this bias.

4.2.3. The deployment of very high speed Internet will accelerate the trends at work in the digital economy

The Government recently reasserted[504] **its commitment to full deployment of very high-speed Internet throughout France by 2022.** Compared to high-speed Internet services over DSL[505], very high-speed Internet (VDSL) offers many advantages.

- It provides subscribers with stable high-speed connections (100 Mbps), regardless of the length of the local fibre optic cable and the distance from the fibre optic network node.
- It improves reliability. Very high-speed access over fibre optic cable is less vulnerable to electromagnetic disturbances and interference.
- It ensures shorter transmission delays than today's ADSL access methods, which use error-correction techniques that have a substantial impact on certain real-time and highly interactive applications, such as network games.
- It makes symmetrical upload-download speeds possible, offering upload speeds that are much higher than with the asymmetrical ADSL access that most residential users have today.

Upgrading network infrastructures will boost the development and improvement[506] **of existing ADSL services.** Broadcasting formats such as high definition (HD), ultra-high definition (UHD), and stereoscopy (3D) will provide steady improvements in picture quality. Over-the-top audio and video services will provide access to audio and video content on users' televisions through their Internet connections. Simultaneous use will be possible for one or more users on the same connection, as the number of connected domestic devices continues to grow. Residential videoconferencing will make it possible for video calls to become more popular than voice calls. Telemedicine could help optimise in-home care as the population ages or in medically underserved areas. Distributed computing is part of the recent trend for hosting applications and computing resources on the network or in the cloud (cloud computing). Teleworking can develop, as can new online games that include multiple-player functions or that operate with computing power hosted on the network, along with home automation, with the connection of various electrical household appliances.

In the longer term, VDSL will also make it possible for new services to emerge, such as:

- Community computing based on the principle of sharing computer resources within a closed group of users, where computing resources are given and received by making a request to the community.
- New education services based on the use of digital blackboards and interactive whiteboards.
- Behavioural avatars, a sophisticated development of ways of representing individuals on social networks that could offer possibilities for customisation, expression and, ultimately, a degree of digital ubiquity.

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504 Communication to the Council of Ministers on 10 October 2012 on the Government's digital strategy.

505 *Digital Subscriber Line*, which is a telecommunications standard.

506 Report commissioned by the following authorities ARCEP, CNC, CSA, DGCIS, DGMIC and HADOPI, *Le très haut débit : nouveaux services, nouveaux usages et leur effet sur la chaîne de la valeur*, 26 July 2011. http://www.arcep.fr/

Deployment of VDSL will boost companies' competitiveness and contribute to local development by providing a wide range of high-quality digital services in sparsely populated areas. But it also promises to be a factor for a radically faster pace of transformation in the post-digital-revolution economy, *including domination by large American digital companies and their growing presence in the value chains of all sectors of the economy.* As is the case with any advances made based on networked software, VDSL contains the seeds of the developments that will widen the gap between the companies that dominate the market and the rest[507]. This makes tax reform all the more urgent at both the domestic and international level, as part of a broader industrial policy.

[507] For more on this subject, see Françoise BENHAMOU, *L'économie du star system*, Odile Jacob, 2002, or Jean-Baptiste RUDELLE, *Vous avez dit progrès ? Pourquoi votre avocat ne peut plus se payer de baby-sitter*, L'Harmattan, 2005.

5. Proposals

The Task Force has made to main sets of proposals:

- The first set deals with international negotiations about the allocation between governments of the power to tax major digital economy companies and about the economic bases, related to users' "unpaid labour", that could be used for a definition of a permanent establishment that is specific to the digital economy.
- The second set of proposals deals with domestic measures that could be taken pending the outcome of these international negotiations. The purpose of these measures is to back up France's potential economic arguments on the international stage with practical achievements and thus *build up some bargaining capital*.

5.1. Re-establishing the harmony between taxes on profits and the digital economy

Taxes on major companies' profits are largely governed by international tax law, which aims to prevent double taxation. This raises two issues: the definition of a permanent establishment, which is the criterion used to attribute the power to tax, and determining transfer prices, which have a decisive impact on where profits are located.

5.1.1. Permanent establishment: the urgently needed adaptation hinges on international negotiations

For the French government to have the power to tax a multinational digital economy company, the company must have a permanent establishment in France performing functions that are likely to produce significant profits that are declared in France. These functions must be entrepreneurial functions and not merely routine functions.

- According to the current OECD Model Tax Convention, a permanent establishment is defined as "*fixed place of business through which the business of an enterprise is wholly or partly carried on.*" The commentaries on the model convention adopted by the OECD member countries stipulate that this definition calls for the existence of a "*place of business*", meaning a facility, such as premises, or, in certain instances, machinery or equipment. The place of business must be "*fixed*", meaning that it must be established at a distinct place with a certain degree of permanence, and that the enterprise carries on its activities through that place, which means usually that the persons who, in one way or another, are dependent on the enterprise (personnel) conduct the business of the enterprise in the country in which the fixed place of business is situated. Even though the commentaries on the Model Convention are not binding, they influence the tax court's interpretation of bilateral conventions, or at least they do when they predate the signature of the bilateral convention in question[508].
- The OECD Committee on Fiscal Affairs made some amendments to this very "tangible" definition of a permanent establishment when the commentaries were revised in 2003 to take into consideration the specific characteristics of the digital economy. For example, the commentaries concede that a server hosting an application and making it accessible is a piece of equipment that has a physical location and, as such, it can constitute a "*fixed place of business*". But the OECD makes a distinction between the server, on the one hand, and the data and software, on the other hand, which the

[508] CE, Sect., *Andritz*, n°233894, 30 December 2003. *Cf.* RJF 3/04 n°238.

commentaries maintain cannot constitute a permanent establishment since they do not involve any tangible property. Nevertheless, the OECD stipulates that a piece of computer equipment in a specific place cannot constitute a permanent establishment unless it is fixed, which effectively excludes any application operated from a cloud computing platform from the definition.

- The French administration's position expressed in its doctrine, which is binding on enterprises[509], is in line with that of the OECD. The notion of a permanent establishment, according to several "ministers' answers", implies a physical presence of the enterprise in the country. It is only in the exceptional case where a foreign company has its own computer equipment in France and employs personnel to operate it that it is deemed possible to consider that this company has a permanent establishment in France[510].

The convention's definition of a permanent establishment prevents the enforcement of domestic laws that could be used in some cases to tax the profits of digital economy companies.

- Article 209 of the French General Tax Code stipulates that profits liable to corporate income tax are to be determined "*solely in consideration of the profits of enterprises operating in France (…) and profits that are to be taxed by France under the terms of an international convention on double taxation.*" However, the case law of the Conseil d'État deems that an enterprise carrying out a "*complete business cycle*" in France should be treated as an enterprise operating in France, even if it has no physical presence there. This was the case for a company with its headquarters in the Principality of Monaco that took orders from French clients for radio advertising messages that were broadcast to French listeners[511]. In the case of advertising, collecting data from users located in France to target advertising in France, could, in the same way, be qualified as a *complete business cycle*, which make it possible to tax the profits in France on the basis of domestic law. But it would be impossible to do so because of the clauses of the Model Convention, which reserve the right to tax the profits of industrial and commercial companies from one Contracting State for that State only. Only in cases where the company carries on a business through a permanent establishment in another State does that other State have the power to tax its profits.
- As the clauses of the bilateral tax conventions stand, as clarified by the OECD's commentaries and the French administration's doctrine, it is highly unlikely that a permanent establishment could be identified solely on the basis of the leverage of the "free labour" of a large number of users in France, even if these users contribute actively to the digital economy company's profits by consenting to the collection of their data[512].

Without sacrificing the benefits of the necessary network of bilateral tax conventions aimed at avoiding double taxation, we need to adapt the notion of a permanent establishment defined by these conventions.

- The purpose of this adaptation should be to make sure the notion of permanent establishment more effectively captures the "free labour" phenomenon, meaning the economic activities generated in a given country by the voluntary collaboration of application users in the production process of a foreign company. Several proposals

[509] Article L. 80 A of the tax procedures book.

[510] Ministers' answers to Mr DE CHAZEAUX, Deputy, JO AN 26 October 1998 p.5849 and JO AN 30 July 2001 p. 4395.

[511] CE 13 July 1968, n°66503, *société X*, Lebon p. 454.

[512] As the law stands, it is bound to be necessary to prove that an entrepreneurial function exists in France, such as negotiating and signing contracts with customers.

deal with the notion of a virtual permanent establishment[513], but no specific definition of this notion has been put forward yet. In the context of the digital economy, a company that provides a service in a country by using data collected through regular and systematic monitoring of users in that country could be deemed to have a virtual permanent establishment there.

- There is nothing artificial about introducing such a definition of a permanent establishment in the context of the digital economy. It is not a matter of "decreeing" that a permanent establishment exists, when the nature of things do not support this assertion, for the sole purpose of surreptitiously adjusting the rules allocating the power to tax profits to the source State, at the expense of the State of residence. It is merely a matter of accepting the fact that, in the digital economy, the notion of a fixed place of business is not relevant for determining the place where the substance of a business activity is carried on. Therefore, we are not seeking to distort the facts, but to find a way of reasoning that, on the contrary, makes it possible to capture reality more accurately.
- International tax law must be changed in order to introduce this approach and apply it to the entire digital economy. The clear expectations resulting from the G20 summit seem to be favourable for negotiations at the OECD. The purpose of these negotiations should be to add a separate definition of a virtual permanent establishment that is specific to the digital economy. After that, France's bilateral tax conventions with its partners that are home to the main places of business of major digital economy companies[514] could be renegotiated to bring them into line with the new standard. Merely amending the commentaries may not be enough, because the current Model Convention does not appear to be very compatible with the new definition being proposed. In any case, the commentaries are merely a guide for tax administrations and the courts. In view of the interpretations already given, it is far from certain that any new commentaries would serve any useful purpose.

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The objective of adapting the rules for allocating the power to tax profits between States is the central thrust of this report. It should be stated as a strategic objective for France. The discussion about how the digital economy creates value, by leveraging user-generated data, is bound to inform tax negotiations, which could move forward at a fairly satisfactory rate, given the G20's influence over the OECD's activity.

5.1.2. Profits: transfer prices must account for users' "free labour"

Amending bilateral tax conventions will make it possible to attribute to France the power to tax profits from activities aimed at France, using data from France, by companies that are not located in France. But such amendments would be pointless without a discussion of how to share the tax base between countries. The profits that France obtains the right to tax could be greatly reduced by royalty payments made to foreign companies or permanent establishments in other countries for the use of intangible assets, such as algorithms or software.

The royalties paid for the use of intangible assets could be subject to a withholding tax when they are paid by a debtor doing business in France to entities that do not have a permanent place of business in France. But Article 182 B of the French General Tax Code, which provides for this withholding tax, cannot be enforced if the actual beneficiary of the

[513] Such as the French Digital Council's proposal in its Opinion No. 8 of 14 February 2012 on discussions about digital taxation.

[514] Primarily Ireland and Luxembourg.

royalty payment is located in a country that has signed a bilateral tax convention with France using the OECD model[515]. All of the European Member States have signed such conventions with France. Furthermore, subject to certain conditions (including an equity threshold), the withholding tax does not apply between associated companies inside the European Union under the terms of Article 182 B bis of the French General Tax Code, which is the transposition of Council Directive 2003/49/EC of 3 June 2003, which eliminates withholding taxes on interest and royalty payments between associated companies within the European Union. All the same, in cases where the final recipient of the royalty is not located in a State party to a bilateral convention or in a Member State of the European Union, the taxpayer may get around the withholding tax by have it pass through a "conduit" country that has signed a bilateral tax convention with France and where domestic laws allow payments to be forwarded to a third country tax free.

5.1.2.1. Restricting profit shifting on the grounds of value creation by users

A new definition of a permanent establishment is not enough. It is also important to create an incentive to keep a portion of the profits in the country. Discussions must start on the respective contributions of different factors of production in the creation of value in the digital economy, otherwise only minimal profits will be captured for taxation. This is a prerequisite to enable the tax administration to discuss transfer prices, especially royalties charged by major digital economy companies for the use of intangible assets.

In order to do so, we need to determine the portion of the profits of the companies concerned that can be attributed to the activity of their users in France. Very little research has been done to determine the share of value contributed by application users from an economic point of view. This contribution comes from the regular and systematic monitoring of users' activity, which generates data, and personal data in particular. However, these contributions are obvious, given the functions of the relevant applications. They produce value in the form of externalities under the business models used. Research work by economists and other scientists is gradually starting to address these contributions and develop theories. More importantly, the market and market observers are documenting these contributions more and more thoroughly.

It is not a matter of seeing application users as volunteer employees of the company, whose work should be compensated by receiving a share of the profits[516]. Instead, on the basis of Article 57 of the French General Tax Code, the point is to determine by subtraction, the excess share of compensation paid for intangible assets situated in other countries, if the contributions of those assets to the profits of the permanent establishment are overstated, which would constitute a transfer of profits. This approach means considering the capacity to make users work and the capacity to collect data as the equivalent of an asset, which needs to be attributed to the permanent establishment in France and its contribution should be compensated at fair value. In this way, the profits would be allocated between the different countries on the basis of the locations of conventional intangible assets, business activity and the application users, who contribute to generating profits through their activities and through the data obtained from regular and systematic monitoring or their activity.

Such an approach may seem both ambitious and legally shaky. But we must consider the fact that taxation of multinational groups is largely the result of negotiations, since it is difficult to make a fully objective analysis of the allocation of the tax base between the

[515] Article 11 of the OECD Model Convention.

[516] If this were case, and we took this line of reasoning to its extreme, we could ask whether it would not mean taxing the sums in question in France, not as the corporate income of the company's permanent establishment, but as the personal income of these volunteer employees, who are compensated in kind in the form of free provision of a service.

countries with the power to tax. A power relationship is established with each of the tax administrations concerned and legal and economic arguments are put forward. These relationships result in a balance of power that determines the allocation of the overall profits between the different countries.

The objective is not to come up with a formula based on unequivocal scientific, technological or economic arguments. As is the case for determining the transfer prices charged between entities in the same group, the objective is to obtain a declaration of profits that reflects the actual respective contributions of the factors of production located in France and the factors located in other countries, such as the intangible assets (particularly software) that the permanent establishment uses, and pays for, in order to carry on its own operations. The first task is to come up with principles and computation methods. The adaptation of these methods to different business models is bound to be discussed on a case-by-case basis, as is often true for taxes on the profits of multinational groups.

5.1.2.2. Using available information to monitor profit transfers

The difficulty with regard to value created by application users does not lie solely in the absence of legal definitions[517]. Determining the value of "free labour" is also difficult because of the scarcity of economic research on this subject. Not one of the economists that the Task Force spoke to was able to come up with a formula for determining the share of value created in a given company through regular and systematic monitoring of users.

However, there is abundant and detailed information available on the market. The digital economy is probably even one of the best-documented economies ever, for two main reasons. First, the very foundation of the digital economy is the collection and processing of data: the companies operating applications and the companies operating the platforms that the applications are built on all know the data relating to audience shares, commitments, interactions, browsing, transactions and geographical, locations. Second, the large numbers of players in the market, doing business inside or alongside major ecosystems, generate large numbers of data flows and, most importantly, they make it necessary for players to agree on how to measure the indicators used to determine prices. Such indicators include the number of HTTP requests for the use of an API, the number of unique visitors for advertising space sales, and the number of clicks for determining affiliation commissions.

Two main sources provide access to this type of data. On the one hand, major digital economy companies provide their own measurement tools for their ecosystems. Any market observer can use tools like Google Trends[518] for free. On the other hand, trusted third parties are emerging in the market, similar to the groups providing ratings specific to the media. They include comScore, Nielsen, Médiamétrie NetRatings and Alexa. Competition in the ratings market[519] has revealed discrepancies between the ratings measured by different

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[517] Even though such a definition already exists for the notion of a "*host*" as a, "*natural or legal person that provides, even at no charge, the storage of signals, texts, images, sounds or messages of all kinds provided by the recipients of these services to make them available to the public by means of online public performance services."* See the Digital Economy Trust Act 2004-575 of 21 June 2004, which transposes this point of Directive 2000/31/EC of 8 June 2000 of the European Parliament and of the Council on Electronic Commerce.

[518] Yossi MATIAS (*Senior Engineering Director in Search, Head of Israel R&D Center*), "Insights into what the world is searching for – the new Google Trends," *The Official Google Search Blog*, 27 September 2012. http://insidesearch.blogspot.fr/

[519] Michael ARRINGTON, "Jason Calacanis Punches Comscore In The Face. Comscore Punches Back. Fred Wilson Drags Us Into It. $SCOR," *Techcrunch*, 24 January 2010. http://techcrunch.com/

companies[520], which stem from the diversity of methods and the pace of changes in technology and products, which require constant adaptation of rating methods[521].

Taxation of large corporations has long relied on market data. Taxes on multinational groups' profits depend on the transfer prices charged by different entities in different countries. To ensure that these prices conform to the arm's length principle derived from the work of the OECD, the tax administration has to compare the prices charged by a taxpayer to a sample of "comparables" drawn from observation of the market. There are many free or paid-access databases that can be used to identify these "comparables" and to back up the arguments put forward by the tax administration or by taxpayers:

- Economic intelligence companies offer databases that can be used to generate samples of comparables in order to determine transfer prices. Examples of such companies include Bureau van Dijk[522] (generalist), S&P Capital IQ[523] (generalist) and KTMine[524] (intangible asset specialist).
- The Security and Exchange Commission (SEC) in the United States provides a free public database called EDGAR, which contains all of the data from the financial disclosures of companies listed in the United States[525]. Specialised companies enhance the data from EDGAR.

However, the data from these sources provide only a partial picture of the digital economy. For example, they cover transactions in intangible assets involving listed companies. On the other hand, they omit data about qualified audience shares, prices on the advertising market and, most importantly, about the flows of personal data and the value they generate. This is understandable, given the recent emergence of the digital economy. This lack of professional market observation is offset to some degree by databases and the vast amount of information available from other sources. In addition to the data available from trusted third parties and market observation and rating professionals, other sources include:

- Data derived from emerging business models based on collecting, aggregating and structuring market data: the Startup Compass product from the Startup Genome Project is one example of a database of operating and financial data provided by tens of thousands of startups[526]. Wikipedia pages on companies centralise a great deal of information from official and informal sources found on the Internet. Glassdoor relies on trusted contributors to collect internal information about working conditions and pay in companies, particularly digital economy companies[527].
- The huge mass of information available from the press, blogs and social networking platforms. The digital economy is so closely scrutinised and analysed by the players in it that, given the dominance of strategies for openness, value creation is often dependent on the speed with which information circulates. Many experts use their blogs or other channels to fill in the many gaps in listed companies' financial

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520 Fred WILSON, "Whose Numbers Are Right?" *A VC*, 10 October 2006. http://avc.blogs.com/

521 Fred WILSON, "comScore Total Universe Report," *A VC*, 22 April 2011. http://avc.blogs.com/

522 http://www.bvdinfo.com/

523 https://www.capitaliq.com/

524 http://www.ktmine.com/

525 EDGAR is used to identify comparables for transactions involving intangible assets: listed companies are required to disclose *"material agreements not made in the ordinary course of business*", which often involve such assets and therefore can be used to reveal their price or economic potential. http://www.sec.gov/edgar.shtml

526 Rip EMPSON, "Startup Genome Ranks The World's Top Startup Ecosystems: Silicon Valley, Tel Aviv & L.A. Lead The Way," *Techcrunch*, 20 November 2012. http://techcrunch.com/

527 Erick SCHOENFELD, "At Glassdoor, Find Out How Much People Really Make At Google, Microsoft, Yahoo, And Everywhere Else," *Techcrunch*, 10 June 2008. http://techcrunch.com/

disclosures through comparative calculations and abundantly documented extrapolations[528].

- Finally, increasingly sophisticated tools are being made available for integrating, analysing and visualising data from different databases. This can be seen in the success of companies like Palantir[529], or, Captain Dash[530] in France. The use of these applications could be transposed to tax audits and investigations.

Looking farther into the future, it is conceivable that players similar to Bureau Van Dijk will emerge, but specialised in the digital economy and leveraging the abundance of data available about it. These specialists would use their databases to track monetary transactions and audience shares on the basis of financial disclosures or ratings by trusted third parties, but they could also track transactions based on data and the value of such transactions, based on samples of comparables derived from different business models.

In the meantime, the digital economy is far from being the most difficult one for the tax administration to monitor. Its development is taking place in plain sight, with intense competition, abundant coverage in the business press, analysis from every angle in countless blogs and, most importantly, a growing volume of data that the tax administration will soon be able to use. Governments should rely on the relevant agencies or academic research centres[531] to build up expertise in this area so that they will be in a stronger position later on, when they have to negotiate with the companies concerned about the allocation of the tax base.

5.1.3. Recovering the power to tax profits should be addressed with a strategy on several fronts

In the short term, objectives relating to corporate income tax will be achieved by practicing tax audits of digital economy companies with two aims:

- Revealing any permanent establishments, by analysing the actual activities of the leading digital economy companies' representatives in France (particularly subsidiaries). This may take the form of demonstrating that the subsidiary constitutes a fixed place of business in France, from which the foreign company's operations are carried out, or demonstrating that the subsidiary is actually a dependent agent with the authority to conclude contracts in the name of the foreign company for its operations in France.

  In this respect, the case law of the Conseil d'Etat is still firmly attached to the actual legal status of an agent, when that agent is dependent in economic terms, but legally independent and does not make commitments to third parties that are legally binding on the principal[532]. In contrast, the commentaries on Article 5(5) of the OECD Model Convention (32.1) hint at greater flexibility. They suggest that an agent may possess actual authority to conclude contracts where he solicits and receives (but does not

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[528] The Slideshare application, where users have now shared more than seven million presentations, is a particularly rich source. Slideshare was acquired by LinkedIn a few months ago, which reflects the value of the information shared on Slideshare in a professional context. See Erik SAVITZ, "LinkedIn To Buy SlideShare For $118.75M; Q1 Crushes Estimates," *Forbes*, 5 March 2012. http://www.forbes.com/

[529] Oliver CHIANG, "Super Crunchers," *Forbes*, 23 February 2011. http://www.forbes.com/

[530] Vincent BERDOT, "Captain Dash ouvre le décisionnel à des sources externes de l'entreprise," *01 Net*, 17 September 2012. http://pro.01net.com/

[531] e.g. the new "personal data" chair at France's Institut Mines-Télécom.

[532] CE, 31 March 2010, *Sté Zimmer Limited*, n°304715 and 308525, which comes up again in CE, Sect., 20 June 2003, *Min c/ Sté Interhome* AG, n°224407.

formally finalise) orders that are sent directly to a warehouse from which the goods are delivered and where the foreign company routinely approves the transactions[533].

- Challenging deductions for royalties paid to foreign entities for the right to use an intangible asset: these royalties may give rise to an adjustment if they are really made for the purposes of treaty shopping, under the cover of a payment to a beneficiary located in a country that France has signed a bilateral tax convention with, when the royalties are actually destined for an effective beneficiary that is subject to the withholding tax.

In the medium and long term, the objective is to complete the negotiations on the allocation of the power to tax digital economy companies between governments.

- In the medium term, this means starting negotiations within the European Union to eliminate uncooperative behaviour by Member States that can be qualified as "conduit" countries, which allow royalties to transit through their territory without being taxed or where the laws allow for "hybrid" arrangements.
- In the longer term, this means engaging international negotiations within both the European Union and the OECD to achieve new rules for allocating the power to tax profits made in France from personal data collected in France.

On the issue of permanent establishments, renegotiation of bilateral tax conventions may not be the only way to reform international law:

- Negotiations at the OECD could lead to a multilateral convention to prevent double taxation of digital economy companies with clauses that the States parties could substitute for the relevant clauses in their bilateral conventions. This type of approach is currently being considered by the OECD as part of its action to combat base erosion and profit shifting. The issue of taxation of the digital economy could receive a boost from such negotiations if they actually start.
- A more original initiative could also be considered within the European Union. The Union does not have the authority to harmonise legislation on direct taxes[534]. However, Article 115 of the Treaty on the Functioning of the European Union allows the Council of the European Union, after consulting with the Parliament and the Economic and Social Committee, to issue directives for the approximation of such laws, regulations or administrative provisions of the Member States concerning taxes, other than those that the Union has the authority to harmonise, "*as directly affect the establishment or functioning of the internal market*." The Commission is already making recommendations about the coordination of domestic tax systems[535]. A European Union initiative could be considered, on the basis of Article 115, to issue a Directive defining a common rule on allocating the power to tax the profits of digital economy companies located in a Member State. Once the Directive has been transposed into domestic law, the rule could be grounds for taxing profits generated by the regular and systematic monitoring of French users' activity by companies located in other Member States. Since the enforcement of bilateral tax conventions is subject to their compliance

[533] See the instructive conclusions by Julie BURGUBURU (BDCF 6/10 n°64) on the scope of this part of the commentary on Article 5(5), which was added to account for laws in common law countries, as well as the commentary on this point by Patrick DIBOUT and Jean-Pierre LE GALL (Dr. fisc. 47/04, étude 44, p. 1662).

[534] The power that the European Union derives from Article 113 of the Treaty on the Functioning of the European Union to harmonise Member States' legislation, "*to the extent that such harmonisation is necessary to ensure the establishment and the functioning of the internal market and to avoid distortion of competition*" applies only to turnover taxes, excise duties and other forms of indirect taxation.

[535] See, for example, the Commission's Recommendation of 6 December 2012 on aggressive tax planning, which urges Member States to have the bilateral tax conventions that they sign with each other or with third countries include clauses aimed at preventing double non-taxation.

with European Union law, this taxation could not be challenged by invoking the clauses of those conventions[536].

- The issue in the short term is to make the economic argument that the users' "free labour" is a source of value creation and thus re-engage and enrich the discussion about taxation of the digital economy by aligning it with the vision that the digital economy has of itself. Its business models are spreading to all sectors of the economy where innovation and growth are driven by data derived from regular and systematic monitoring of application users' activity.

5.2. In the meantime, build up some bargaining capital with a well designed special tax

The plans for special taxes for the digital economy that have been put forward so far are not very credible, since they only capture a few sectors or business models. They are likely to be circumvented and result in undesirable biases in players' economic choices. Furthermore, the taxes being considered turn out to be easy for the statutory taxpayers to pass on to other economic agents in most cases, since the taxes affect markets where the statutory taxpayers have a great deal of bargaining power.

This does not mean that we should give up any ambitions in this area. A special tax could be helpful in the run-up to international negotiations to amend the territoriality rules for corporate income tax. But the tax must meet certain criteria. It must apply to the entire digital economy and yet be neutral with regard to the choice of business models. It must be aimed at a tax base that is at the heart of the digital economy and not merely a consequence of it. It must be beneficial for Web users and not be a burden for them. The tax must support and promote economic development and industrial innovation, instead of stifling them. It must be consistent with the long-term objective of recovering the power to tax the profits of the companies concerned.

5.2.1. Introducing a tax incentive for the collection and use of data

Data form the raw material that fuels the digital economy. They have a special value, that economic science[537] and government statistics[538] still have trouble capturing. They are produced by the "free labour" of Web users contributing to the output of digital economy companies that the tax system has a hard time measuring. This means that any special tax needs to be designed with regard to user-generated data and the use of these data. In the short term, without waiting to see how international negotiations on taxing profits turn out, we can introduce *tax incentives based on companies' use of the data that they collect through regular and systematic monitoring of the activity of the users of their applications.*

There are three main reasons why this avenue is the most promising of all of those that the Task Force presented to its many contacts:

- Data play a central role in the digital economy: they are the factor that is common to all successful business models in all of the sectors that have been transformed by the digital economy. Making data a tax base will fulfil the need for neutrality.

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[536] See CJEU, 12 May 1998, C- 336/96, *Gilly*; CJEU, 12 December 2002, C-385/00, *de Groot* ; CE, 27 July 2012, No. 337656 and 337810, *Ministère c/ Regazzacci*.

[537] Erik BRYNJOLFSSON, "Measuring the 'Attention Economy'," 19 September 2012. and "Techonomy 2012: Why it Matters that the GDP Ignores Free Goods," 7 December 2012, The MIT Center for Digital Business. http://digitalcommunity.mit.edu/

[538] Michael MANDEL, "Beyond Goods and Services: The (Unmeasured) rise of the Data-Driven economy," *Progressive Policy Institute Policy Memo*, October 2012. http://www.progressivepolicy.org/

- Governments have undisputedly legitimate authority to regulate the collection and use of personal data. The founding of the French Data Protection Commission (CNIL) so long ago and the tasks performed by this independent administrative authority are testimony to this legitimacy. Alongside competition law, personal data protection is the main lever for action with regard to digital economy companies.
- Focusing on data collected from Web users located in France makes it possible to develop a territoriality rationale based on the geographical origin of the data, the location of the individual data subjects and the jurisdiction of the regulator, which is the Data Protection Commission (CNIL) in this case.

5.2.1.1. Objectives of the proposal

A tax on data collection must avoid two pitfalls. *On the one hand*, it cannot be an indirect tax based on the quantity of data collected by companies. Such a tax would comply with only some of the criteria set out above. Furthermore, it is not certain that it would comply with the principle of equal tax treatment, which calls for the tax burden on taxpayers to be proportionate to their ability to pay. Not all data have the same economic value and the quantity of data collected is not necessarily related to the profits that can be earned from them. The same type of pitfalls could appear as those seen in the case of a tax on bandwidth use. *On the other hand*, the primary objective of such a tax cannot be to generate fiscal resources.

Using data as a tax base can only have the aim of providing an incentive for the taxpayers to act in accordance with public interest objectives:

- France's Constitutional Council[539] has agreed that, for this type of levy, the tax burden can be allocated according to a criterion other that the ability to pay without infringing the principle of equal tax treatment. The Council requires only that the allocation criteria be justified by the objectives that lawmakers have set for the tax.
- Therefore, what we are proposing is a special tax, like the general tax on pollution-producing activities or the "carbon tax". But instead of applying to emissions of greenhouse gases, this tax would apply to practices involving the collection, management and commercial exploitation of personal data generated by users located in France. The underlying rationale is to use the tax to discourage practices that are "non-compliant" with the objectives and to encourage, through a tax reduction or exemption, practices that a "compliant" with these objectives.

The public-interest objectives that this tax is aimed at achieving would be based on two elements: *on the one hand*, the potential for economic development offered by personal data and, *on the other hand*, the dangers that uncontrolled practices regarding the use of these data are likely to raise for the protection of public freedoms. In other words, the aim is to achieve convergence of the business models based on the use of data on users' activity and "alternative models" based on data protection and their restitution to users. There are four of these objectives:

- Enhancing protection of individual freedoms on the Internet, by returning ownership of their personal data to users.
- Facilitating access to new services.
- Supporting innovation in the digital trust market.
- Promoting productivity gains and value creation in the domestic economy.

[539] See Decision 2000-441 DC of 28 December 2000.

5.2.1.2. Details of the proposal

The general design of this special tax could be as follows:

- The scope of its base and territorial application would be defined as a set of companies, regardless of the country where they are established, that use data collected from large numbers of users located in France. However, not all data seem to be the same with regard to the objectives set out above. The tax could apply only to data that are collected through the "free labour" of users who are dynamically participating in the companies' value chains. By way of analogy with a notion used in data protection legislation, the tax could affect only data derived from the *regular and systematic monitoring of users' activity*[540]. The processing of these data is the most critical with regard to protecting public freedoms, in contrast to the processing of data collected occasionally and independently of any context related to the behaviour of the data subject.
- The tax would only apply above a threshold expressed as a number of users to be determined, with a distinction between identified users and anonymous users. This is because the need to enhance protection of public freedoms with regard to the use of personal data is especially imperative when dealing with large aggregates of data. Setting such a threshold would also be desirable to avoid handicapping startups with new taxes and to facilitate the administration of the tax by limiting the number of taxpayers concerned.
- The tax could take the form of a unit charge per user monitored[541]. The charge would be determined according to the company's position on a chart showing its performance with regard to the objectives of the tax. The more "compliant" the company's practices are regarding the collection, management and use of data derived from users' activity, the lower the unit charge would be. The charge could even be waived for the most compliant companies. On the other hand, the more "non-compliant" the company's practices are the higher the unit charge.
- The tax could be assessed on the basis of dual declarations. In one declaration, the company would quantify the volume of data that it collects and uses through regular and systematic monitoring of users, subject to an audit by the tax authorities. In another declaration, the company would be required to commission external audits by independent third parties[542] to qualify its behaviour and practices with regard to the criteria set out in the performance chart, which would then determine the unit charge applied.

It is not yet time to determine exactly which practices could be qualified as "compliant" or "non-compliant". But a few examples could be given:

- For the objectives of enhancing protection of individual freedoms and supporting innovation on the digital trust market, the compliance of practices could be assessed according to how users can exercise their rights under the French Data Protection Act[543]. "Compliant" practices would include providing full disclosure to users about the nature of the data collected, including a record of pages viewed, presenting clear and

[540] See the proposed European Regulation on Data Protection - SEC (2012) 72 final. Its Article 35 stipulates that a data protection officer must be named, "*when… the core activities of the controller or processor consist of processing operations, which, by virtue of their nature, their scope and/or their purposes, require regular and systematic monitoring of data subjects.*"

[541] Using a unit to be determined, which could be each account opened in the application or each device, as defined by its IP address, used to access the application.

[542] Similar to statutory auditors.

[543] Data Protection Act 78-17 of 6 January 1978.

accessible consent agreements[544], properly integrating access functions into the user interface[545] and making the user interface readable by software agents for personal data protection[546]. "Non-compliant" practices, on the other hand, could include failing to provide enough information about data collection or an interface that is not user-friendly for access to data for correction[547]. The point is to assess whether, in addition to meeting its legal obligations, which it must do in any case, the company's approach goes above and beyond compliance with the letter of the law.

- With regard to the objective of promoting access to new services, practices could be assessed for compliance, for example, on the basis of the portability of the users' personal data[548] collected by the service in the event that the user's account is closed (as is the case for the portability of telephone numbers when users change operators).
- With regard to the objective of promoting productivity gains and value creation, the assessment could consider whether users can request and control access to their data by third parties offering new services[549], in keeping with the idea of restitution of personal data.

5.2.1.3. Scope of the tax

We might wish to run an experiment with the new tax that is limited to a small number of taxpayers, selected as far as possible from the digital economy. In doing so, it is critical use objective criteria to limit the scope of the tax in order to avoid infringing the principle of equal treatment of taxpayers.

- The most indisputable criterion is to consider only data collected through regular and systematic monitoring of users' activity, within the meaning of the European Regulation on personal data protection.

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544 For example, by making the user agreement readable for software "agents" to facilitate the analysis of points that are of the greatest concern for users and to inform their consent decision.

545 This could be based on the certification policy that the French Data Protection Commission is developing and on a number of simple technological and ergonomic criteria, such as the number of clicks needed to access the user's data from the home page. Thought could also be given to enabling software operated by digital trust market players to read and parameterise anonymous session cookies, as is the case for the YourAdChoice platform, operated by the Digital Advertising Alliance, which provides American Web users with a function called the AdChoices Icon. (http://www.youradchoices.com)

546 "*In computer science, an agent, which derives from the Latin agere (to do) is the equivalent of a software robot. It is a computer program that carries out tasks like an automat in accordance with the developer's instructions. In the context of the Internet, intelligent agents are linked to the semantic Web, where they are used to act on behalf of humans to carry out searches and make correlations between the results of the searches. They do so according to set rules. They are capable of acting with some degree of autonomy and can talk to each other. For example, the intelligent agent of a person wishing to make a purchase can talk to the agents of sellers to compare prices, quality and services. Furthermore, the study of interactions between several agents is the specific area of multi-agent systems, a computer science discipline that emerged in the nineteen-eighties.*" http://fr.wikipedia.org/

547 An example of the practical problems of accessing certain functions related to personal data protection is described in detail in the following article (in the American legal system): Rebecca Greenfield, "Facebook Now Knows What You're Buying at Drug Stores," *The Atlantic Wire*, 24 September 2012. http://www.theatlanticwire.com/

548 For example the option of downloading personal data in a machine-readable format, such as XML or JSON.

549 The existence of an Application Programming Interface (API) for third-party development of applications that reuse the data under the control of and on behalf of the user (like the applications installed on an iPhone that have access to all of the iPhone functions and some of the personal data stored on the device) or else making data collected from users accessible in aggregated form as long as every precaution has been taken to ensure statistical secrecy. See Renaud FRANCOU, « MesInfos : quand les "données personnelles" deviennent vraiment… personnelles », *Internet Actu*, 4 December 2012. http://www.internetactu.net/

Box – Netflix's conversion to regular and systematic monitoring of users

An article from the Netflix tech blog[550] **illustrates what the notion of "*regular and systematic monitoring*" entails** and how it is consistent with the objectives set in the Task Force's proposals.

Netflix used to specialise in DVD rentals through the mail. At the time, it won customers on the strength of its online recommendation engine, which aimed to recommend films that matched the customers' tastes and also took account of the fact that DVDs could not be reproduced infinitely, which meant that Netflix could not rent the same film to too many customers at the same time.

As Internet bandwidth increased in the United States, Netflix diversified into the streaming video market. This second line of business has become its core activity, which it is now taking to new markets outside the United States, in several European Union countries.

In a blog post on changes to the Netflix recommendation algorithm, two employees explain that, "*one of the reasons our focus in the recommendation algorithms has changed is because Netflix as a whole has changed dramatically in the last few years. Netflix launched an instant streaming service in 2007. Streaming has not only changed the way our members interact with the service, but also the type of data available to use in our algorithms.*

For DVDs our goal is to help people fill their queue with titles to receive in the mail over the coming days and weeks; selection is distant in time from viewing, people select carefully because exchanging a DVD for another takes more than a day, and we get no feedback during viewing.

For streaming members are looking for something great to watch right now; they can sample a few videos before settling on one, they can consume several in one session, and we can observe viewing statistics such as whether a video was watched fully or only partially." **When DVDs are sent through the mail**, the point is to analyse past consumption and opinions about films to ensure that the user makes the right choice. This analysis includes comparisons with other users for the purposes of collaborative filtering. **When films are streamed, much more abundant data are collected** and the point becomes to observe all of the user's browsing in the catalogue and viewing of trailers to come up with recommendations in real time, by means of relatively simple statistical computations that are less algorithm-heavy, but involve larger data sets.

In other words, the more data are collected (or the more regular and systematic the monitoring is) the less the algorithm matters. Consequently the case of Netflix outlines the argument that value creation, with the introduction of regular and systematic monitoring, shifts from the company's intangible assets (the algorithms) to the users' own activity (the data collected). *The algorithmic intensity of the service rendered is inversely proportional to the intensity of data collection.*

- Another approach would be to determine the scope of the tax on the basis of the "host" status, within the meaning of the Directive on Electronic Commerce[551]. Hosting service providers are not liable under civil or criminal law for the data posted online by users. In this way, they signify that they do not claim to exercise any control over these data, which is why the restitution of the data to users is organised by adopting practices that are "compliant" with the highest level of requirements, so that the users have full control of the online data with no legal obstacles (some licences entitle the company exclusive de facto control) or technical obstacles (problems exercising the right of access or the lack of an API for the re-use of data in other applications). Inspections could be carried out in this regard.

[550] Xavier AMATRIAIN and Justin BASILICO, "Netflix Recommendations: Beyond the 5 stars (Part 1)," *The Netflix Tech Blog*, 6 April 2012. http://techblog.netflix.com/

[551] Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market. Hosts are defined as "*natural or legal persons that provide, even at no charge, the storage of signals, texts, images, sounds or messages of all kinds provided by the recipients of these services to make them available to the public by means of online public performance services.*"

- We could also use criteria relating to the nature of the data (observed data, data volunteered by users or inferred data derived from further processing[552]) or to the application environment, for example by limiting the tax to "native" applications that are used directly through the operating system of a smartphone, tablet or another device under the terms of the user agreement of an application store, such as the Apple App Store or Google Play, but the distorting effect of these criteria would be significantly greater than that of the previous criteria[553].
- Combining the criterion of regular and systematic monitoring with a high threshold means that only a small number of taxpayers would be liable to the tax at first and we could experiment on them to see how much of an incentive the new tax provides for adopting "compliant" practices[554].

5.2.1.4. Taxation and data restitution

A tax incentive for data restitution must be backed up by educational efforts and, most importantly, by experimentation.

- The objectives related to enhancing the protection of public freedoms by restoring users' ownership of their personal data (promoting practices that are "compliant" with the right to access and rectify data) are likely to garner a broad consensus. But the objectives relating to open access to data might be a different story, even if they involve greater control by the data subjects and even if this open access is aimed at providing users with more services and promoting innovation and growth.
- The mood with regard to open access and restitution of personal data practices is ambivalent. Some see these developments as a means of regaining control of their data (restitution) while others see them as practices involving the risk of uncontrolled dissemination of their data. Furthermore, exposing users to market pressure that puts a value on their data and makes money from them could be seen as contrary to data protection, which is considered a fundamental right.
- To overcome this ambivalence, the "MesInfos" project run by Fondation Internet Nouvelle Génération (FING) provides a basis for noteworthy experimentation[555]. The project aims to highlight the common interests of companies and consumers served by introducing data restitution practices and is a precursor of potential innovation on the digital trust market.

The share-alike license, used in open access policies for public data (by the City of Paris, for example), provides an interesting parallel. This license authorises enterprises

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[552] The Bain report for the World Economic Forum defines three notions: *volunteered data* (personal data voluntarily provided by individuals explicitly submitted and shared), *observed data* (personal data captured by tracking the use of a service, where data collection is authorised but does not result from any action for the explicit purpose of providing these data from the user's point of view), *inferred data* (personal data derived from processing by the company, which collates other personal and non-personal data). See WORLD ECONOMIC FORUM, in collaboration with BAIN & COMPANY, *Personal Data: The Emergence of a New Asset Class*, January 2011. http://www.bain.com/

[553] The Task Force recommends ruling out criteria based on the device (computer, table, smartphone, connected object, payment medium, boxes). This criterion is not neutral with regard to technologies or business models. This means it is also liable to be overturned on the grounds of unequal treatment of taxpayers, as has been shown in a non-tax matter by the rules on royalties for private copies. This is why the Task Force recommends concentrating on the criterion of regular and systematic monitoring of users' activity, regardless of the device and application environment used.

[554] Under these conditions SMEs using an application that involves regular and systematic monitoring and large companies that do not engage in such monitoring would not be concerned.

[555] Renaud FRANCOU, « MesInfos : quand les "données personnelles" deviennent vraiment… personnelles », *Internet Actu*, 4 December 2012. http://www.internetactu.net/

accessing public data free of charge to make commercial use of them, provided that the results of this use are also made available free or charge. On the other hand, if the company wants to charge money for the results of its use of the data, it must pay the administration for a non-exclusive license for commercial use of the data. The idea of promoting "compliant" practices, including "restitution" of users' data is similar. The commercial use of data derived from regular and systematic monitoring of users' activity *without monetary consideration* would create a tax liability, unless the company implements "compliant" practices[556].

Another type of example is French copyright law, which combines a moral right, which is the right to authorise or prohibit use of the work (similar to the consent of a person for the collection and processing of their personal data), **with property rights** that assure authors of compensation if they authorise commercial exploitation of their work. The notion of property rights is absent from the laws governing personal data[557]. The precedent of the hybrid nature of copyright under French law[558], unlike the copyright system in common-law countries, shows that the notion of property is in no way compatible with a perpetual, inalienable and permanent moral right.

5.2.1.5. Tax audits

The administration needs to be able to carry out effective audits to ensure that the companies concerned comply with their tax obligations, even though many of these companies are not located in France. For this purpose, it seems necessary to require them to appoint a tax representative in France. Such a requirement does not raise any problems for companies located outside the European Union. But for companies located in another Member State, the matter is more delicate. The Court of Justice of the European Union case law sees such a requirement as an impediment to the freedom of establishment and the freedom of provision of services or the free circulation of capital and only allows such requirements when they are justified by sufficient public interest grounds. The desire to collect taxes and combat tax fraud is not considered sufficient grounds on its own[559], given that there are already mutual assistance arrangements for combating tax fraud[560] and collecting debts[561] in the European Union.

The objective of protecting individual freedoms that underpins our proposal could change things. It involves more than just collecting taxes and might therefore be seen as sufficient public interest grounds to justify a restriction of the free provision of services

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[556] As part of the opening up of the City of Paris data, the share-alike license "*authorises companies that so wish to use the data for commercial purposes, provided that they then agree to share their creation under the same conditions (this is the "share-alike" clause, like the one in the Creative Commons CC-By-sa license used by Wikipedia). Companies that do not wish to agree to this share-alike requirement can purchase a non-exclusive license."* See Jean-Louis MISSIKA (Deputy Mayor of Paris for Innovation), "Open Data : Paris ouvre ses données," *Speech to the Paris City Council*, June 2010. http://www.paris.fr/

[557] Absent, but still a subject of debate. See, for example Julien BREITFELD, "De l'économie des données personnelles," *Error 404*, 13 January 2013. http://blog.marklor.org/. Pierre BELLANGER, "La liberté compétitive – Contribution à la mission d'expertise sur la fiscalité de l'économie numérique," 2 October 2012. http://www.skyrock.fm/bellanger/

[558] SOCIETE DES AUTEURS ET COMPOSITEURS DRAMATIQUES, "Droit moral, droit patrimonial," *Le statut juridique de l'auteur*. http://www.sacd.fr/

[559] See for example CJEU 5 May 2011 C-267/09 European Commission v/ Portuguese Republic

[560] See Council Regulation (EU) 904/2010 on administrative cooperation and combating fraud in the field of value added tax, Council Regulation 2073/2004 and Council Directive 2004/106 concerning mutual assistance by the competent authorities of the Member States in the field of direct taxation, certain excise duties and taxation of insurance premiums and Council Directive 2011/16/EU on administrative cooperation in the field of taxation.

[561] The procedures for mutual assistance for collecting debts have been modernised and the scope of this assistance extended by Council Directive 2010/24/EU, which was transposed into Articles L.283 A to D of the French Tax Procedures Book and by Commission Regulation 1189/2011.

within the European Union[562]. In any event, setting a threshold number of users, under which the tax would be waived, means that the number of taxpayers would be limited so that it would not be unreasonable, failing the appointment of a tax representative, to rely on international mutual assistance arrangements if necessary. Furthermore, since the companies concerned are very careful about their public image, which they regard as a strategic asset, the French tax administration would not be left totally toothless in the highly unlikely event that the tax administrations of other Member States fail to live up to their mutual assistance obligations.

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The proposal to introduce an incentive-based data tax presents clear advantages:

- It can be discussed and implemented independently of any international negotiations, but still echo the discussions to be engaged as part of the previous proposal on the power to tax profits derived from the activity of French Web users. It is actually the same subject. The data collected and processed represent the value created by French Web users and captured by major digital economy companies. The special tax would enable the tax administration to acquire knowledge of these companies' economic models and how they are organised and how they operate. This knowledge will be extremely helpful for any discussion of transfer prices.
- It has the potential to be a virtuous source of constraints, like eco-taxes, for companies that make money off of data collected from their customers, starting with the major digital economy companies, which will eventually have to decide between paying the tax or changing their practices. At the same time, it is a clear opportunity for digital economy startups, since the "restitution" of data to the control of the data subjects could facilitate their development efforts. The measure ends the systematic alliance between major digital economy companies and startups to face down any new tax proposal.
- The proposal would enable France to gain an industrial advantage by becoming a focus of innovation that would attract innovative companies from all over the world and by taking the initiative to standardise computerised protection of user data, which would be useful for the future development of the market for software agents designed to protect these data. This is a segment of the digital trust market where French companies can still gain favourable positions.

The Task Force wishes to highlight three crucial points with regard to implementation of this new tax.

- The data tax cannot be merely a tax on collecting personal data. It must be progressive and provide an incentive for practices that are "compliant" with public interest objectives. Otherwise, it would infringe the constitutional principle of equal tax treatment, because the volume of data collected is not related to the taxpayers' ability to pay.
- The data tax must provide an incentive for "compliant" practices, to avoid a perverse effect that deters French companies from collecting data. As a recent editorial published in *Le Monde* stated, "*by failing to build a Web 2.0 industry, [France] has deprived itself of access to this resource [data], including data generated in France. (…) Because we failed to develop this industry, we are soon likely to be buying many goods and services, produced and consumed in France, such as train tickets or electricity, from a foreign provider, which will generate a large percentage of the value added and control the industrial chain."* France must not deter companies from collecting data. On the

[562] Like the requirement to appoint a tax representative set out in Article 302 bis ZN of the French General Tax Code for entities that are not located in France and liable for one of the levies cited in Articles 302 bis ZG, 302 bis ZH and 302 bis ZI of the same code (levies on online gambling).

contrary, it must encourage them to do so, as long as they adopt "compliant" practices, such as the restitution of such data to users.

- Finally, an innovative tax with a base that is still poorly captured by economics, accounting and tax law requires an experimental phase, where it is applied only to the largest taxpayers. Ideally, it should be underpinned by a political determination to use the appropriate instruments of industrial policy to make sure French companies adopt "compliant" practices. For this reason, the tax cannot be seen as a revenue-generating measure, or at least not at first.

5.2.1.6. Ensuring consistency with the territorial authority of the French Data Protection Commission (CNIL) and the provision of electronic services subject to VAT

5.2.1.6.1. Strengthening the authority of the French Data Protection Commission (CNIL) to regulate data collected in France

Discussions are now under way in Brussels on a proposal for a European Union Regulation[563] dealing with the processing of personal data.

- The European Commission and the large companies concerned are seeking to impose the competence of the regulator of the State where the main establishment is located. If they succeed, the Irish counterpart to France's Data Protection Commission would have sole competence to regulate the personal data that the major digital economy companies located in Ireland collect from every State in the European Union, including France.
- If, as the Task Force proposes, personal data become the base for a special tax and, eventually, corporate income tax, this new attribution of competence is unacceptable from France's point of view. Such a tax can be applied only in a context where the major digital economy companies are directly accountable to the French authorities for the collection and processing of the personal data of French residents. Therefore, the French Data Protection Commission must be the direct and permanent point of contact for these companies. Otherwise, an unbridgeable gap will open up between the companies concerned and the French government, and this gap will have a practical impact when a tax is applied to data collection.
- Consequently, it is essential for the Ministry of the Economy and Finance and the Ministry for Industrial Renewal to have a say in the negotiations. It must argue for digital sovereignty and help the French Data Protection Commission defend and reassert its attributions with regard to the European Commission and the other Member States, which are being lobbied intensely by the major digital economy companies located in Ireland.

5.2.1.6.2. Territoriality of VAT on electronically-supplied services

The key criterion for applying French VAT rules to electronically supplied services is the place where the customer is established, has his permanent address or usually resides[564]. However, at present, this criterion applies only to services provided from outside

[563] SEC (2012) 72 final

[564] Combined provisions of Articles 259, 2°, 259 B and 259 D.

the European Union. As the law stands[565], the provision of services is taxable in France if, on the one hand, the customer for the service is a non-taxable person who is established, has his permanent address, or usually resides in France and, on the other hand, if the service provider has established his business or has a fixed establishment from which the service is supplied outside the European Union (or who, in the absence of such a place of business or fixed establishment, has his permanent address or usually resides outside the European Union)[566].

As of 1 January 2015, this territoriality rule will be extended to all electronically supplied services provided to non-taxable persons who are established, have their permanent address or usually reside in France, regardless of where the service provider is located (France, another European Union Member State or a third country or territory outside the European Union)[567].

The notion of establishment largely overlaps that of place of business. According to the case law of the Court of Justice of the European Union[568], another establishment should only be taken into consideration in cases where using the main place of business would not lead to a rational solution from the tax point of view or would create a conflict with another Member State. In principle, the *permanent address* of a taxable or non-taxable natural person is the one declared to the tax administration[569]. The *usual place of residence* of a taxable or non-taxable natural person is the place where, at the time when the services are provided, that person usually resides because of personal and professional relationships or, in the case of a person with no professional relationships, because of personal relationships showing close links between the person and the place where they live[570].

Sometimes, the notion of place of effective use or enjoyment of the service also comes into play.

- This happens primarily when Member States opt to "offshore" the service outside the European Union. Article 59a(a) does allow Member States to consider the place of supply of services, which should be situated in their country under the general territoriality rules, as being situated outside the European Union if the *effective use and enjoyment* of the services takes place outside the European Union. Conversely, Article 59a(b) allows Member States to consider the place of supply of services, which should be outside the European Union country under the general territoriality rules, as being situated in their country, if the *effective use and enjoyment* of the services takes place there. But, as of today, this "onshoring" option does not apply to electronically supplied services under the terms of the last paragraph of Article 59. It will not apply until 2015 and only if Member States take up the option.
- The notion of *place of effective consumption of the service* is also used in the VAT administration rules. The Implementing Regulation of 15 March 2011 laying down implementing measures for the VAT Directive of 2006[571] sets out the service provider's obligations with regard to determining the place of establishment of the of the

[565] The version incorporating the transposition of Council Directive 2008/8/EC of 12 February 2008 amending Directive 2006/112/EC with regard to the place of provision of services.

[566] If, on the other hand, the service provider is located in another Member State of the European Union, other than France, the service provided to the same taxable recipient is deemed to be located in the State where the provider is located.

[567] Instruction 3 A-1-10 of 4 January 2010, No. 154.

[568] See: CJEC 4-7-1985 C-168/84, Berkholz ; CJEC 2-5-1996 C-231/94, FG Linien, 6th ch.: RJF 10/96 No. 1256 ; CJEC 20-2-1997 C-260/95, DFDS.

[569] Instruction 3 A-1-10 of 4 January 2010, No. 19.

[570] Instruction 3 A-1-10 of 4 January 2010, No. 20.

[571] Council Implementing Regulation (EU) 282/2011 of 15 March 2011 laying down implementing measures for Directive 2006/112/EC on the common system of value added tax.

customer (Articles 23 and 24). If the supply of services is taxable in the European Union at the customer's place of establishment, or in the absence of an establishment, at his permanent address or the place where he usually resides, the supplier shall establish that place based on factual information provided by the customer, and verify that information by normal commercial security measures like those relating to identity or payment checks. The Regulation stipulates that when the services are provided to a non-taxable person *who is established in more than one country or has his permanent address in one country and his usual residence in another, priority shall be given to the place that best ensures taxation at the place of actual consumption.*

The territoriality rules for data derived from regular and systematic monitoring of users' activity should be laid down to be consistent with the territoriality rules for VAT, with the emphasis on the place where the user is established, has his permanent address or usually resides. The criterion of place of effective use of the service should only be resorted to if the main criteria are not helpful. Furthermore, if, by 2015, France has taken up the options offered under the new wording in Article 59a of the Directive to "offshore" or "onshore" services by applying the criterion of place of effective use and enjoyment, the same choice should be made for the data tax.

5.2.1.7. In the absence of compliance with filing obligations, capture data outflows from France using the interconnection with telecommunications operators' networks.

Online application operators with large numbers of users in France sign interconnection agreements with telecommunications operators. They pay French operators the agreed sums, which depend on their traffic volume and their market power, in order to obtain substantial improvements in the performance of their applications, such as the time it takes for pages to load.

Interconnection agreements have already been considered as a potential tax base. A bandwidth tax, considered by a report on smart television[572], would tax the supply of consumer bandwidth services, such as YouTube, a service operated by Google. It would rely on French telecommunications operators for its assessment and collection. The aim of such a tax would be to capture indirectly, by means of an excise tax, the profits earned in France by companies established in other countries. However, this tax has one major drawback, which is that there is no relation between bandwidth consumption and the profitability of a service.

However, it is still possible to look into the traffic flow through interconnection points for tax purposes, but from another angle. Instead of looking at downloads (e.g. video content), we should look at the data flowing out of France via the interconnection points. The way the Internet is set up means that these data outflows contain all of the data that foreign companies collect from French Web users through the use of applications like Google, YouTube and Facebook. Two methods for capturing the data outflows could be considered:

- The first would be an excise tax on the volume of data outflows. Such a tax would have several drawbacks, however. From the economic point of view, it would run into the problem explained above, namely that the operating profits earned from data outflows are not necessarily proportionate to the volume of data, and also the fact that the data do not all have the same intrinsic value. From the legal viewpoint, such a tax could also be seen as an impediment to the freedom to provide services, if it was applied only to companies established abroad, at least as far as companies established in a Member State other than France are concerned. Therefore, an identical tax would have to be levied on French companies for the personal data that they collect on French Web users.

[572] See above the discussion about the proposals in the report on the future of smart television.

- The second possible use for data outflows could be to offset foreign companies' potential lack of awareness of their filing obligations with regard to the volume of data that they collect from France. The flows measured at the interconnection points could be used as a base for a tax on the use of data by applying a unit charge, as discussed above. However, it would not be easy to give such monitoring power to the tax administration. The monitoring would have to distinguish outflows corresponding to services that French companies provide to foreign Web users from those that actually correspond to outflows of personal data, and, where appropriate, to distinguish data flows that are just meaningless "noise". This would entail requiring French access providers to perform such outflow sorting by implementing a deep packet inspection (DPI) procedure[573]. Although it is technically possible, this should only be considered as a last resort. It runs the risk of being perceived as irregular government intrusion into the content of data flows exchanged over the Internet.

5.2.1.8. Finally, investigate the possibility of a special tax on mobile application platforms

Introducing a tax on all of the companies that collect and use personal data from their users in France is an ambitious project. We could consider a preliminary experiment with a data tax that is more limited in scope, a tax that would only apply to the application platforms that are presented as application stores.

With the spread of mobile devices, applications distributed through application stores form a rapidly expanding market. Several companies have set up such distribution platforms to promote their own applications and to showcase applications from other developers. Examples include Apple's App Store, Google's Google Play Store, RIM's Blackberry App World and Amazon's Kindle Fire Apps. These platforms are now central to the major companies' strategies and have been used for billions of downloads. They offer several thousand new applications every day.

Application platforms constitute an economic model and an autonomous market. They are fully dedicated to specific devices, smartphones and tablets. They are ring fenced and the platform manager controls access. They deal only with users who are identified by name, since users need to have an account with the platform manager. The platform operator invoices the users. These features mean that the platforms are not in direct competition with companies selling Web applications for use with a browser. The platforms have even been reckoned to be "*the death of the Web*"[574]. This makes it possible to consider a special tax that would not infringe the principle of equal tax treatment.

Furthermore, the user agreements of these platforms give them control over the data collected by the applications using their resources. Developers determine the titles and content of their applications and the relevant pages, but they must still comply with the platforms' user agreements[575]. These platforms have more or less stringent verification and approval procedures for new applications.

The result is that it is legally possible to make the platforms liable for the tax on the use of data. It would then be up to them to require the application developers that they agree

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[573] *Deep packet inspection* (DPI) consists of network infrastructure hardware analysing the content, and not just the header, of a network packet (IP packet in most cases) to compile statistics, filter packets, or detect intrusions, spam or any other predefined content. DPI can be used to censor the Internet or as part of arrangements to protect intellectual property. It is contrasted with stateful packet inspection, which concerns only the packet headers.

[574] Chris ANDERSON, "The Web Is Dead. Long Live the Internet," *Wired*, 17 August 2010. http://www.wired.com/

[575] For example, the Apple distribution agreement stipulates that the developer must comply with the Personal Data Protection Act of 6 January 1978.

to host, especially those that serve large numbers of users, to comply with constraints on the collection and use of user data. For example, the platforms could provide a programming interface for application developers that can be used for restitution of user data across the entire platform or they could require developers to adopt "compliant" practices in their user agreements. It should be noted that, by increasing their already hefty cut of the prices that users pay, the platforms could, where appropriate, pass the tax on to users who purchase paid applications.

5.2.2. Adapting taxation of R&D and market financing to the realities of the digital economy

The digital economy features experimentation, rapid prototyping, successive iterations, constant adjustments and the occasional spectacular "pivot"[576]**.** In just fifteen years, technological progress has reduced the cost of such experimentation for companies to such an extent that technology is not always a decisive differentiation criterion when it comes to determining success or failure. But technological innovation is still a very strong force and it is the reason why the digital economy is so capital intensive, at every stage of companies' development. This is especially true as the digital economy gradually spreads to connected objects and sectors where the specific economic, legal or even cultural features make them more difficult to transform.

France must not merely submit to the development of the digital economy. Its exponential growth in France should produce additional tax revenue. This is the ultimate purpose of this report. But, the best way to ensure that the productivity gains stemming from the digital economy benefit the domestic economy is still to make sure that French companies manage to emerge and attain dominant positions in the various markets. Taxation of the digital economy must therefore be favourable for the development of French companies, from startup to global scale, and it should provide them with access to appropriate financing. Financing of digital economy companies depends on taxation in two ways. Taxation of R&D needs to be more in line with the realities of the digital economy and offset the structural weakness of French companies through a special effort to provide access to market financing.

5.2.2.1. Adapting taxation of R&D to the digital economy

Taxation of R&D operations is biased because of a misunderstanding of the crucial activities for success in the digital economy: design, business models and traction are just as much a part of R&D as data collection and processing, algorithms and software architecture. Taxation of R&D is also incompatible with the underlying principle of the digital economy: breaking down barriers between the inside and the outside of organisations. This principle means that all activities, including R&D, are carried out in closer contact with customers and users. Legislation and, more especially, practices with regard to the research tax credit give companies, particularly startups, an incentive to focus their efforts on obsolete priorities that do not lead anywhere. Correcting this bias is a major issue for competitiveness. There are two ways to achieve this.

[576] Jenna WORTHAM, "In Tech, Starting Up by Failing," *The New York Times*, 17 January 2012. http://www.nytimes.com/

5.2.2.1.1. Merging the research tax credit and the New Innovative Company scheme for startups

As indicated above, the dual characteristics of startups are their fragile finances, which make them especially reliant on tax breaks for R&D, **and their weak human resources**, which should be concentrated on growth rather than undertaking long, complicated and expensive administrative formalities.

There are two main assistance schemes at present for digital economy startups' R&D: the research tax credit and the New Innovative Company scheme. Today, young companies have to deal with administrative formalities that they are barely capable of managing in order to benefit from these two schemes early enough to maximise their effects.

- The fact that two separate schemes serve virtually the same purpose and have the same effects, even though they have slightly different bases, is in itself a source of complexity, since companies have to devote much greater resources to complete the formalities successfully. On top of that, there are many special or sector-specific assistance schemes in the digital economy, such as those awarded by OSEO, as well as, where appropriate, applications for the "*Innovative Company*" classification, which is a prerequisite for being eligible for equity investment from tax-sheltered Innovation Investment Funds (FCPI).
- The very fact that startups have to fill out detailed applications raises questions. Startups often have abundant documentation (fundraising literature, sales literature, business plans), which is sometimes public (press and blog coverage) and is often sufficient as is to present their business to experts. Requiring companies to describe the state of the art that they are seeking to disrupt is in contradiction with the fact that the experts examining the application are supposed to know more than the applicants about the state of the art.
- The professionals who advise startups, such as accountants or lawyers, are rarely specialised in such companies, which are not very rewarding clients for them, or in the digital economy in general. Therefore, they often know little about these special assistance schemes and have trouble advising their clients about them. This has given rise to a prosperous specialised consultancy business, which in too many cases obtains a cut of the aid received in exchange for basically rewriting the company's presentation of its activity to make it appear more in keeping with the traditional conception of cutting-edge technological R&D.
- Finally, the conception of R&D underlying these schemes is, as we have seen, out of step with R&D and innovation in the digital economy. This gap is hard to overcome and it increases the companies' administrative burden by requiring them to recast the authentic presentation of their business to make it conform more to an obsolete conception of R&D.

The Task Force proposes the following measures to correct these many problems.

- Merging the research tax credit and the New Innovative Company scheme for digital economy startups by rolling both procedures into one and combining both types of aid for the same set of eligible expenditures. Startups benefitting from the special single scheme for the digital economy will not be allowed to receive the ordinary research tax credit as long as they are classified as New Innovative Companies. In practice, this measure would consist of recasting the New Innovative Company scheme and making it the sole tax and corporate aid for R&D and innovation in digital economy startups. The recast scheme could then be used as a criterion for access to certain aid schemes and for the reduction in wealth tax granted for investment in small and medium-sized enterprises.

- Undertaking sweeping reform of the examination and qualification of R&D activities in the digital economy, in two ways:
  - Replacing the current dual administrative examination (tax administration and Ministry of Research) with two categories of trusted third parties to qualify New Innovative Companies: first, the *competitiveness clusters* that these companies will be required to join and which are already experts in qualification procedures for collaborative R&D; second, *venture capital funds* that invest in these companies in the first two years[577]. These funds would also be required to join the competitiveness clusters and their investment in a company would be equivalent to qualification by the cluster. Qualification, which can be used to validate the innovative character of the activity and the reality of the R&D activities, would not automatically make companies eligible for the scheme, but it would allow the administration concentrate on the financial and tax aspects of the application, as it does for collaborative R&D.
  - Having the competitiveness clusters[578] design and implement a qualification system that is adapted to the constraints of startups: requiring applicants to provide pre-existing documents first (fundraising literature, sales literature, technical literature, press and blog coverage, online demonstrations), instead of a standardised application; providing an opportunity for the applicant and the examiner to talk, making it possible for applicants to ask competitiveness clusters to help them successfully complete the procedure, particularly when compiling the application, having the tax administration and the Ministry of Research set up a system for certifying the competitiveness clusters' procedures for qualifying New Innovative Companies.
  - If a competitiveness cluster or an investment by a venture capital fund belonging to a cluster qualifies a company in its first two years, the administration could not reject its eligibility for any reason other than those relating to the content of its R&D operations, unless it can provide its own proof that the R&D does not advance the state of the art.
  - Basically, the qualification criteria must relate to characteristics of companies that are likely to grow to a large scale in the digital economy: the company must be set up from the outset to attain strong and rapid growth. It must rely primarily on digital technologies, ideally open source developments. It must base its activity and its potential productivity gains on the collection and use of data.

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One of the main advantages of the research tax credit is its neutrality. *In theory*, it covers R&D in every sector of the economy and in companies of all sizes. But, *in practice*, the research tax credit applies differently in each sector. Since its implementation causes distortions, its theoretical neutrality is hard to defend. More specifically, the examination of companies' applications introduces procedural biases that favour large groups and companies with good advice over startups. The examination of the applications is based on a

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[577] By calling on venture capital funds to act as trusted third parties, the arrangement is similar to the co-investment concept implemented on a large scale in the Israeli innovation ecosystem as part of the "Yozma" programme. See Ilene R. PRUSHER, "Innovation center? How Israel became a 'Start-Up Nation.'" *The Christian Science Monitor*, 9 March 2010. http://www.csmonitor.com/. On Israel in general, see Dwyer GUNN, "How Did Israel Become "Start-Up Nation"?" *Freakonomics*, 12 April 2009. http://www.freakonomics.com/. Ilan MOSS, "Start-up nation: An innovation story," *OECD Observer*, No. 285, 2011. http://www.oecdobserver.org/

[578] There are seven digital economy competitiveness clusters. Four of them are national clusters: Cap Digital (digital content and services – Paris region), Systematic (design, production and control of complex systems – Paris region), Images et Réseaux (images and networks – Rennes) and Minalogic (micro-electronics – Grenoble). Three of them are regional clusters: Transactions (secure electronic transactions – Le Mans), Solutions (secure communications – Sophia-Antipolis) and Picom (commerce – Lille).

conception of R&D that is more or less adapted to software technologies by the *Frascati Manual* and administrative doctrine, but it still favours the conventional economy over the digital economy and R&D inside organisations over open R&D. Introducing a special scheme for the digital economy and for startups, with a reformed and specialised New Innovative Company scheme, does not mean giving up on the neutrality of the research tax credit, but it does provide a means for re-establishing this neutrality and overcoming the most serious flaws.

All of the shortcomings of R&D assistance in the digital economy point to a "missing paragraph" in the *Frascati Manual*. France could take the initiative to have this paragraph included in the future. This paragraph should apply, not to information and communication technology in general, but to the specific R&D of digital economy startups exclusively. This means companies that rely on intensive use of digital technology and have acquired the human resources for this purpose; companies that base their activity on regular and systematic monitoring of their customers and the users of their applications; companies that use constant design improvements and an innovative business model to pursue their strategic objective of transforming a sector of the economy; companies that are designed from the outset to achieve strong and rapid growth.

5.2.2.1.2. Starting research on transforming the research tax credit into an insurance scheme that unleashes positive externalities

The growth of the digital economy is not attributable solely to startups, even though they do play a decisive role. It is also driven by large companies, for which the research tax credit could also be reformed to adapt it to the characteristics of R&D in the digital economy.

- R&D is a form of risk taking. Like any other risk (accident, disease, loss of employment or death), it can be covered by insurance. Market flaws, such as moral hazard or adverse selection, must be countered with certain provisos. But this can be achieved without challenging the insurance aspect of the scheme's risk coverage, as has been shown by the example of social insurance schemes.
- In the digital economy, it is difficult to keep R&D confined inside organisations. When it addresses design or business models, it cannot be protected by patents and improvements can be copied by competitors as soon as they reach the market. When improvements concern computer code, they are often outclassed by open source software developments. When improvements concern algorithms, the value of the R&D does not lie in the algorithm itself so much as in the learning that comes from the ensuing collection of massive amounts of user-generated data. In other words, in the digital economy, R&D always takes place outside the organisation, in execution and in contact with users.

This means that the research tax credit is counter-productive for large companies. It is supposed to cover them for the risks that they incur in their R&D activities, but it does not provide an incentive for them to open up their R&D to unleash its full potential and achieve better results through contacts with other companies or with users. Consequently, it subsidises R&D that companies fail to make full use of and it encourages retention rather than preventing it.

The digital economy research tax credit could take the form of insurance in order to overcome this flaw. Instead of compensating future expenditure, it would become an indemnity for losses after they occur. In this case, a loss for an R&D project would mean work that fails to produce a marketable innovation. This virtuous line of reasoning would encourage taxpayers to make every effort to realise the potential of their R&D before reporting a loss and seeking an indemnity. Examples of such efforts could be:

- Selling R&D results (or licensing them) to another company through an auction or through a joint venture with a partner contributing complementary resources. The advantage of such a move for the company is that it achieves a partial return on its investment. The advantage for the government is that the company can apply for the research tax credit only on the residual expenditure that has not been offset by the proceeds from the sale or the license.
- Making R&D results available on a software platform for use via an application programming interface, so that open innovation can build on the company's unfruitful efforts to transform its R&D into innovation. Once again, the platform could generate revenue, which would mean that the government would grant the research tax credit only for the residual expenditure that is not offset by the revenue from the platform.
- Making R&D results open source so that communities of developers can build on the company's efforts to unleash the full potential of its R&D. In this case, the company does not receive compensation, but this option lets it become part of an innovation ecosystem and gain a strategic advantage for the future. In this case, the research tax credit covers all of the expenditure.
- There is only one case where no indemnity would be paid for a loss. That is the case where the R&D fails to produce an innovation, but the company still prefers to retain the results under the protection of industrial secrecy, rather than releasing them to the market through a sale, a software platform or a contribution to an open source community.

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The Task Force does not go beyond the principles of transforming the research tax credit for large companies into an insurance scheme to adapt it to the characteristics of the digital economy:

- The underlying rationale is that of software economics[579], which show that opening up R&D and building on it in an ecosystem creates more value than going to any length to keep R&D efforts confined inside organisations. This proposal makes its possible, at no extra cost for public finances, to cover R&D "losses" while promoting the development of an innovation ecosystem by maximising the positive externalities stemming from openness.
- The proposal does not call the entire research tax credit system into question. Instead, it consists of setting up a special version that is more consistent with the fundamentals of the digital economy. Its more attractive tax base rules and rates would give companies an incentive to choose this option, which would not necessarily be more costly for public finances.

5.2.2.2. Enhance tax incentives for market financing of the digital economy

As shown by the examples of Silicon Valley and the Israeli digital ecosystem, the availability of capital for startups is a decisive factor for development of the digital economy, not so much because of capital intensity of individual projects, but because an economy at the technological frontier needs to generate a multitude of projects in order to maximise the chances of at least a few of them succeeding. Venture capital, where the economic model is based on achieving capital gains, plays a key role in these ecosystems. But it is far from being the sole market financing vector for a digital ecosystem.

[579] And tomorrow, it will be that of hardware, with the growth of the open hardware movement.

France's 2013 Budget Act has taken this into account and maintained the flat-rate withholding tax for managing partners in companies[580], even though the capital gains tax rules have been reformed to bring them into line with those applying to earned income. To address the issues on a broader basis than just capital gains tax, the Task Force would like to put forward the following topics for examination and discussion.

- Large companies have a role to play in backing digital economy startups, through direct corporate venture capital investment in startups. The ultimate purpose of corporate venture capital is primarily for large companies to forge relationships with an ecosystem of startups that can be both sources of inspiration for innovation and potential takeover targets when their growth and specialisation makes them ripe for incorporation into the shareholder's organisation. Corporate venture may make for more virtuous relationships between large companies and startups than subcontracting, which makes the startup dependent on its customer in operational terms and requires it to have enough working capital to cover the lags in cash flow resulting from invoice collection times. Incentives for corporate venture capital investment could take two forms: a corporate income tax credit, coordinated with the competitive tax credit adopted in France's 2013 Supplementary Budget Act, or partial inclusion of the relevant operations in the expenditures eligible for the research tax credit, if the companies invested in are eligible for the reformed New Innovative Company scheme.
- Another way to promote venture capital equity financing for digital economy startups would be to simplify and unify the tax breaks for investors in New Innovative Companies (under the reformed scheme) along the lines of the "Innovative Company" scheme that makes some companies eligible for investment from tax-sheltered innovation investment funds "FCPI). However, eligibility for the scheme would be obtained through qualification by a competitive cluster or a venture capital fund. Eventually, all of the incentive schemes for private equity investment in SMEs, which have been criticised for their dispersion and lack of effectiveness[581], could be brought together in the case of the digital economy and merged into a single scheme based on the reformed New Innovative Company scheme. Since the digital economy features a high level of risk for investors, as well as the promise of huge returns to scale for successful companies, the tax incentive could focus primarily on capital gains tax[582], and, secondarily, on wealth tax.
- A third way to promote equity financing for digital economy startups would be to draft legislation for experiments with crowdfunding modelled on the Crowdfunding Bill proposed by Barack OBAMA and passed by the United States Congress as part of the JOBS Act[583] in the spring of 2012. This bill was the focus of considerable criticism and concerns[584]. Crowdfunding has played an increasingly important role in financing new companies and organising events, with the spectacular growth of Kickstarter, the standard bearer for this business model[585]. Kickstarter raised more than 300 million

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580 See Article 10 of the 2013 Budget Act 2012-1509 of 29 December 2012. http://www.legifrance.gouv.fr/

581 COMITE D'EVALUATION DES DEPENSES FISCALES ET DES NICHES SOCIALES, *Evaluation des dispositifs fiscaux en faveur du capital-investissement dans les PME*, rapport n° 2010-M-042-03, ministère de l'économie, de l'industrie et de l'emploi, ministère du budget, des comptes publics et de la réforme de l'État, 2010. http://www.economie.gouv.fr/

582 Like the exemption under Article 150-0 A, III, 7 of the French General Tax Code

583 "With passage of JOBS Act, Steve Case, AngelList founder and others look forward to a less-regulated start-up world," *The Washington Post*, 27 March 2012. http://www.washingtonpost.com/

584 See, for example, the impact on startups, Ben POPPER, "JOBS Act passes House: What the new crowdfunding bill would mean for startups," *Venture Beat*, 8 March 2012. http://venturebeat.com/

585 Carlye ADLER, "How Kickstarter Became a Lab for Daring Prototypes and Ingenious Products," *Wired*, 18 March 2011. http://www.wired.com/. For a critical point of view, see Noreen Malone, "Fund me, I'm useless: The False Promise of Kickstarter," *The New Republic*, 16 November 2012. http://www.tnr.com/

dollars from 2.2 million people to prefinance more than 22,000 projects in 2012[586]. It has the potential to disrupt the venture capital business[587]. Many observers also see crowdfunding as a critical factor for the growth of the Internet of objects[588]; the capital cost of manufacturing the first series could be financed through crowdfunding from a community of investors who are also future customers. The prefinancing model is reassuring for the company, since the financial risk of prototyping and even the first production series is borne by this community of early backers. Given its capacity to raise larger and larger sums[589], crowdfunding is no less of a vector for competitiveness and sovereignty than venture capital.

- Finally, a special tax, combined with the research tax credit recast as insurance, could be introduced to support future advances in financial engineering for innovation in large listed companies and to give them the possibility to have the market bear their innovation risks without adding to their liabilities. As the digital economy "eats" up all economic sectors, the large groups with dominant positions in these sectors have their own role to play in innovation efforts. Otherwise, they might let the large companies that dominate today's digital economy eventually start siphoning off the bulk of profits in all sectors' value chains without paying French taxes on the corresponding income.

5.2.3. Developing expertise within the tax administration

The digital economy is not a sector of the economy. It is a vector for the transformation of all sectors of the economy, where it is causing a major shift of profits from conventional companies towards companies that operate networked software services.

The radical nature of the transformations should rule out any wait-and-see stance or a purely defensive response. These transformations require the Ministry of the Economy and Finance to acquire suitable expertise, even if it is only for two or three years, to achieve three objectives:

- Having a say in and driving international discussions and negotiations relating to the digital economy, its impact on taxation and the changes that are needed in domestic and international tax laws.
- Familiarising the rest of the tax administration, including tax inspectors, with the digital economy, its business models and the key role played by user activity and user-generated data in value creation.
- Putting forward arguments in dealings with the financial markets and the academic world that best capture how the digital economy disrupts value creation and challenges our conceptions regarding the territoriality of taxes.

This expertise can rely on some pre-existing resources at the Ministry of the Economy and Finance, in the Directorate General of Public Finance and the Directorate General of the Treasury.

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586 KICKSTARTER, "The Best of Kickstarter". http://www.kickstarter.com/year/2012

587 Ki Mae HEUSSNER, "Fred Wilson: What crowdfunding means for the VC business," *GigaOM*, 8 May 2012. http://gigaom.com/

588 Sarah KESSLER, "How Kickstarter Is Saving Hardware Innovation," *Mashable*, 4 May 2012. http://mashable.com/

589 Recently, the "Elite: Dangerous" project beat the record for the amount raised on Kickstarter, by collecting *1.25 million dollars* to pre-finance the production of an updated version of a nineteen-eighties video game. See Carol PINCHEFSKY, "'Elite: Dangerous' Sets the Record for Highest Kickstarter Goal to Be Successfully Funded," *Forbes*, 3 January 2013. http://www.forbes.com/

Complementary work could be started, in conjunction with the National Statistics Institute and the Accounting Standards Authority, **on the economic nature of data** and how their value can be captured in the national statistics system and by accounting standards.

CONCLUSION

"There are many things that have changed in secret, that we haven't seen changing, but which have completely disrupted the world."

— Michel SERRES[590]

The digital revolution is a transformation every bit as crosscutting and radical as the invention of electricity was in its time. The purpose of the painting "*The Electricity Fairy*" that the Paris electricity company commissioned from Raoul DUFY in 1937 was to "*highlight the role that electricity plays in national life and show in particular the leading social role played by electric light*." The mural illustrates the dissemination of electricity throughout the economy and the sweeping changes that it triggered in society as a whole, far beyond the confines of the electrical industries. There is an explanatory law for electricity: once it has been produced, electricity cannot be stored, which means that supply has to match demand at all times. There is also an explanatory law for the digital economy: it breaks down the barriers between the interior and the exterior of organisations and makes it possible to leverage the activity of millions of users, whose "free labour" makes them auxiliaries for the production of goods and services.

Recognising the role in creating value played by users of the applications that make up the digital economy leads to the conclusion that France must tax some of the profits derived from companies' regular and systematic monitoring of users' activity. As individual users become more connected, better equipped and more educated, value creation increasingly shifts from inside companies towards those individual users. The data derived from their activity represent a significant share of the value created in the economy as a whole. To remain competitive, companies have to adapt their strategies to leverage this activity in the production chain and acquire a new class of assets that facilitate data collection and processing. These assets include interfaces, algorithms and business models. Finally, data collected in a country should be taken into account when determining tax bases. The attribution of these data to the country where the user of the service is located is indisputable, especially in the case of personal data. This should be reflected in the tax system.

It is important to ensure two types of consistency in this effort:

- Consistency between domestic taxation and international tax negotiations: Both sets of proposals are based on data derived from regular and systematic monitoring of users' activity. These two topics ultimately converge, since, as is the case for transfer prices, we will gradually have to learn how to put a price on data flows. Filing requirements will be much easier to comply with because, in the digital economy, the taxpayers track everything.
- Consistency between tax policy and industrial policy. A special tax for the digital economy would only make sense if it were part of an industrial policy. This means the tax must have two objectives: correcting the tax advantage enjoyed by digital economy companies located in other countries and encouraging French companies to choose strategies that are line with the dynamics of this economy by providing them with the necessary support.

[590] Laurent VALDIGUIE, « Serres : "Ce n'est pas une crise, c'est un changement de monde" », *Le Journal du dimanche*, 30 December 2012. http://www.lejdd.fr/

The tax must also create an incentive for French firms holding large volumes of data about the users of their services and engaging in regular and systematic monitoring of users' activity. If French companies fail to use their current market positions to leverage these data by becoming software platforms, as today's digital economy giants have done, they will eventually have to compete with these giants. The arrival of these companies in the value chain will reduce the French companies' profits to nothing and deprive the government of tax revenue as well. Therefore the tax should be an incentive for companies that have fallen behind to catch up to the state of the art in the digital economy (exploitation of data in compliance with fundamental rights) and even advance beyond it (enhanced data protection and restitution).

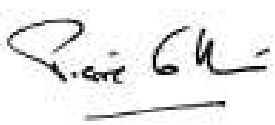
With this objective in mind, the Task Force's proposals are organised as follows:

- The proposals dealing with R&D support are aimed at fostering innovative startups in France and inciting large companies to make innovation efforts that are more consistent with the digital economy.
- The proposals dealing with taxation of equity financing are aimed at fostering support for digital economy startups achieving large-scale development from France.
- Introducing tax incentives for the collection and processing of personal data is aimed at taxing companies that are not established in France and at encouraging French companies to change their strategies, leverage the customer and user data more effectively and, where necessary, acquire for this purpose startups whose development has been facilitated by the two previous sets of proposals.

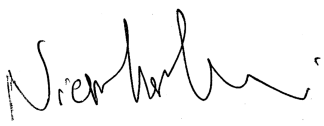
The strategic objective guiding the drafting of this report is that France should recover the power to tax the profits derived from the "free labour" of Web users situated in France. The keys to the potentially successful implementation of its proposals are the intrinsic qualities of the arrangements to be put in place, political backing in the long term from domestic leaders and international organisations, along with gradual implementation of the proposals that includes the necessary consultation and information sharing with the French and foreign companies concerned.

Paris, January 17, 2013,

PIERRE COLLIN
Conseiller d'État



NICOLAS COLIN
Inspecteur des finances



ANNEXES

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ANNEX 1

Letters of Appointment

Annex 1

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

LE MINISTRE DE L'ECONOMIE ET DES FINANCES

LE MINISTRE DU REDRESSEMENT PRODUCTIF

LE MINISTRE DELEGUE AUPRES DU MINISTRE DE L'ECONOMIE ET DES FINANCES CHARGE DU BUDGET

LA MINISTRE DELEGUEE, CHARGEE DES PETITES ET MOYENNES ENTREPRISES, DE L'INNOVATION ET DE L'ECONOMIE NUMERIQUE

Paris, le 24 juillet 2012

Monsieur,

La révolution numérique s'étend aujourd'hui à tous les secteurs de l'économie où elle provoque de profondes mutations. Même si elle est commencée depuis plusieurs années, cette diffusion va connaître une très forte progression dans les années à venir. Au-delà de la simple évolution des modèles existants, le numérique pose de nombreuses questions nouvelles et remet souvent en cause les modèles d'organisation existant. Il pousse notamment à l'apparition de nouveaux mécanismes économiques fondés sur les actifs incorporels et sur l'économie de l'immatériel.

Source de richesse et de croissance, le numérique a fait émerger de nouvelles formes d'activités, de consommation et de transactions que notre système fiscal appréhende encore difficilement. En effet, le rôle central de la publicité dans le financement de services gratuits pour le consommateur final, l'extrême souplesse d'organisation territoriale des prestations et des transactions ont rendu souvent obsolètes et inefficaces les règles classiques de la territorialité permettant d'asseoir l'impôt.

Ainsi, il est aisé pour les grands opérateurs de l'économie numérique de s'établir dans les Etats à fiscalité avantageuse : il en résulte un manque à gagner pour nos finances publiques et un désavantage compétitif pour les opérateurs français, par rapport aux groupes internationaux qui s'organisent pour éviter ou réduire leur imposition.

Trois types d'activités devront faire l'objet d'un examen de votre part, notamment au regard de l'imposition du chiffre d'affaires et de l'imposition des bénéfices :

- le commerce électronique ;
- la prestation de services électronique payante ;
- la prestation de services électroniques gratuite pour le consommateur.

Monsieur Pierre COLLIN
Conseil d'Etat
1, Place du Palais Royal
75001 PARIS

Le commerce électronique, qu'il donne lieu à une livraison physique d'un bien acheté à distance ou au téléchargement d'un contenu par voie dématérialisée, fait l'objet de règles fiscales propres : notamment le régime des ventes à distance, en matière de TVA, qui ne soulève pas en lui-même de difficulté de principe. La question se pose aujourd'hui de savoir si le commerce électronique subit une charge fiscale équitable au regard de l'ensemble des charges fiscales pesant sur le commerce « physique ».

Les prestations de services payantes font l'objet d'une réforme en cours au niveau de l'Union européenne. Le changement des règles de territorialité de la TVA applicable aux services électroniques en 2015 devrait permettre de supprimer la concurrence fiscale entre pays puisque les services payants seront dès cette date soumis à la TVA dans le pays du consommateur et non plus celui du prestataire de services. La concurrence entre opérateurs, liée au taux de TVA de leurs Etats respectifs d'établissement, devrait donc disparaître. La réforme des règles de territorialité de la TVA, si elle traite de la taxation du chiffre d'affaires, laisse toutefois sans réponse la problématique de la taxation des bénéfices.

Concernant les services gratuits, dont le modèle économique repose notamment sur les recettes publicitaires, le droit fiscal existant est inopérant pour frapper la matière taxable d'opérateurs non résidents. La gratuité ne fait pas obstacle par ailleurs au développement de mécanismes de co-création qui peuvent faire naître des enjeux fiscaux liés à la propriété intellectuelle.

Votre mission devra en premier lieu dresser l'inventaire des différents impôts et taxes qui concernent aujourd'hui les acteurs du secteur. Cet inventaire permettra de connaître le poids de l'impôt sur les entreprises du numérique en France. Ce constat sera éclairé par les données issues d'une comparaison internationale – avec une attention particulière pour les fiscalités des autres pays européens - permettant d'évaluer la situation des sociétés au regard de cette fiscalité multiforme.

En second lieu, vous formulerez des propositions d'évolution du droit qui permettront de taxer les opérateurs exerçant une activité en France ou fournissant un bien ou un service à des consommateurs français. Au-delà, vous pourrez présenter toute proposition de mesures qui conduiraient à adapter le système fiscal aux pratiques économiques nouvelles qui sont nées de la révolution numérique. Vous veillerez à avancer, au moins en partie, des préconisations dont la mise en œuvre peut s'envisager à court terme sans attendre l'issue des négociations en cours (Union européenne, OCDE).

Vos conclusions contribueront à créer les conditions, pour ce secteur, d'une participation à l'effort fiscal mieux répartie entre ses différents acteurs et favorable à la compétitivité de la filière numérique française. Cette réforme fiscale devra s'inscrire dans la sécurité juridique, mettre fin aux différences de traitement face à l'impôt constatées aujourd'hui et garantir un rendement conforme aux objectifs budgétaires de l'Etat.

Pour la réalisation de vos travaux, vous veillerez à associer largement à vos réflexions les opérateurs de la filière numérique, et bénéficierez du soutien des administrations placées sous l'autorité du ministère de l'Economie et des Finances et du ministère du Redressement productif.

Vous serez attentifs aux réflexions menées au sein du Conseil national du numérique ainsi qu'à l'évolution des travaux parlementaires en cours. Vous veillerez également à une bonne articulation de vos travaux avec ceux qui seront conduits par Pierre Lescure dans le cadre de sa mission sur le futur « acte II de l'exception culturelle ».

Nous souhaitons que vous rendiez vos conclusions au plus tard le 15 décembre 2012.

Nous vous prions de croire, Monsieur, à l'assurance de notre considération distinguée.

Pierre MOSCOVICI

Arnaud MONTEBOURG

Jérôme CAHUZAC

Fleur PELLERIN

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RÉPUBLIQUE FRANÇAISE

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Monsieur Nicolas COLIN
Inspection générale des finances
139, rue de bercy – Bâtiment Colbert
Télédoc 335
75532 PARIS cedex 12

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Pierre MOSCOVICI

Arnaud MONTEBOURG

Jérôme CAHUZAC

Fleur PELLERIN

ANNEX 2

List of Persons Met by the Task Force (in French)

Annex 2

Annex 2

PERSONNES RENCONTREES

M. Eric ADERDOR, président, Syndicat des régies Internet

Mme Isabelle AMAGLIO-TERISSE, conseillère, cabinet de la Ministre de l'artisanat, du commerce et du tourisme

M. Oussama AMMAR, fondateur, TheFamily

Mme Marie-Pascale ANTONI, directrice des affaires fiscales, Mouvement des entreprises de France

M. Jacques ANTZENBERGER, direction des affaires fiscales, Mouvement des entreprises de France

M. Jean-Luc ARCHAMBAULT, président, Lysios

M. Gilles BABINET, *Digital Champion* de la France, Commission européenne

M. Bernard BACCI, directeur fiscal, Vivendi

M. Gilles BACHELIER, président de sous-section, Conseil d'Etat

M. Maxime BAFFERT, directeur général, Publicis Webformance

M. Olivier DE BAILLENX, directeur des affaires publiques, Iliad

M. Fabrice BAKHOUCHE, conseiller technique, cabinet du Premier ministre

M. Philippe BAUER, consultant senior, Interel

M. Pierre BELLANGER, président-directeur général, Skyrock

M. Pierre-Jean BENGHOZI, directeur de la chaire innovation et régulation des services numériques,École polytechnique ParisTech

M. Bernard BENHAMOU, délégué aux usages de l'Internet, Ministère de l'enseignement supérieur, de la recherche et de l'innovation

Mme Françoise BENHAMOU, membre du collège, Autorité de régulation des communications électroniques et des postes

M. Yochai BENKLER, professeur, Harvard Law School

M. Jean-Marc BENOIT, directeur général, June21

M. Laurent BENZONI, professeur, Université de Paris 2-Panthéon-Assas

M. Frédéric BEREYZIAT, directeur juridique, Centre national du cinéma et de l'image animée

M. Denis BERTHOMIER, conseiller culture, cabinet du Premier ministre

M. Bruno BEZARD, directeur général, Direction générale des finances publiques

M. Jean-Jacques BERTRAND, *Partner*, Orkos Capital

Mme Véronique BIED-CHARRETON, directrice, Direction de la législation fiscale

M. Loïc BODIN, délégué général, Renaissance numérique

Mme Aude BORNENS, administratrice principale, Sénat

M. Michael BORRUS, *General Partner*, XSeed Capital

Mme Laura BOULET, directrice des affaires publiques et juridiques, Union des annonceurs

Annex 2

M. Denis BOUCHEZ, délégué général, Association « Information politique générale »

M. Claude BOULLE, président, Conseil du commerce de France

M. Amaury DE LA BOURDONNAYE, chef du service fiscalité, Procter & Gamble Holding France SAS

M. Fabien BOUSKILA, directeur associé, Greenwich Consulting

M. Christophe BRESSON, directeur fiscal groupe, Groupe France Télécom Orange,

M. Philippe CAHANIN, direction des vérifications nationales et internationales, Direction générale des finances publiques

Mme Brigitte CANTALOUBE, directrice générale, Yahoo! France

Mme Emilie CARIOU, conseillère technique, cabinet de la Ministre déléguée chargée des petites et moyennes entreprises, de l'innovation et de l'économie numérique

M. Andrew CECIL, directeur affaires publiques, Amazon EU

Mme Claire CHALVIDANT, responsable des affaires réglementaires et institutionnelles, Groupe France Télécom Orange

Mme Valérie CHAVANNE, directrice juridique, Yahoo! France

M. Bruno CHIOCCHIA, chef de bureau, Direction générale de la compétitivité, de l'industrie et des services

M. Martin COLLET, professeur, Université de Paris 2-Panthéon-Assas

Mme Nathalie COLLIN, présidente, Association « Information politique générale »

M. Yvon COLLIN, sénateur du Tarn-et-Garonne, rapporteur pour la Commission des finances du Sénat

M. Philippe COLLOMBEL, *Managing Partner*, Partech International

M. Olivier COROLLEUR, directeur des affaires économiques et de la prospective, Autorité de régulation des communications électroniques et des postes

M. Jean-Michel COUNILLON, secrétaire général, TF1

M. Jean-Luc CHRETIEN, directeur général, Groupe Accor

Mme Liz CUNNINGHAM, *Head Tax EMEA*, Google

M. Stephen DALE, avocat associé, Landwell & Associés

M. Pascal DALOZ, *Executive Vice President, Strategy & Marketing*, Dassault Systèmes

M. Jean-Marie DANJOU, directeur général délégué, Fédération française des télécommunications

M. Nicolas DEBOCK, chargé d'affaires senior, XAnge Private Equity

M. Arnaud DECKER, secrétaire général, Lagardère Active

M. Nicolas DEFFIEUX, directeur des affaires économiques et de la prospective, Autorité de régulation des communications électroniques et des postes

M Pierre-Frédéric DEGON, responsable des Relations Institutionnelles, Association française des éditeurs de logiciel

Mme Marie DELAMARCHE, directrice générale, Syndicat des régies Internet

M. Giuseppe DE MARTINO, président, Association des services Internet communautaires

Mme Maxence DEMERLE, déléguée générale adjointe, Syndicat de l'industrie des technologies de l'information

Mme Laurence DERMENONVILLE, conseillère technique, cabinet de la Ministre de l'artisanat, du commerce et du tourisme

M. Carlos DIAZ, *Chief Executive Officer*, Qwarter

M. Philippe DISTLER, directeur général, Autorité de régulation des communications électroniques et des postes

M. Francis DONNAT, *Senior Policy Counsel*, Google

M. François-Xavier DOUAY, directeur fiscal, HP

M. Julien DOURGNON, conseiller politique, cabinet du Ministre du redressement productif

M. Laurent DUC, président, Union des métiers et des industries de l'hôtellerie

Mme Anne-Sophie DUFERNEZ, Direction générale du Trésor

Mme Diane DUFOIX, chargée des relations institutionnelles, FNAC

Mme Sophie DUVAL, conseillère auprès de la Ministre, cabinet de la Ministre de l'artisanat, du commerce et du tourisme

M. Graham EDWARDS, *Entrepreneur in Residence*, XSeed Capital

Mme Marie EKELAND, co-présidente, France Digitale

M. Nicolas EL BAZE, *General Partner*, Partech International

Mme Laurence ENGEL, directrice du cabinet, cabinet de la Ministre de la culture et de la communication

M. Olivier ESPER, *Director, Public Policy*, Google

Mme Anne-Florence FAGES, directrice de mission numérique, Mouvement des entreprises de France

Mme Isabelle FALQUE-PIERROTIN, présidente, Commission nationale de l'informatique et des libertés

Mme Séverine FAUTRELLE, chargée de mission affaires européennes et internationales, Canal+

M. Hugues FEBVRET, direction des opérations spéciales, Mouvement des entreprises de France

M. Jean-Luc FECHNER, directeur des relations extérieures, Groupe Casino

M. Xavier FILLIOL, président de la commission « Musique », Groupement des éditeurs de services en ligne

M. Frédéric FILLOUX, éditeur, Monday Note

M. Benoît FOUILLAND, directeur financier, Criteo

Mme Sylvie FORBIN, directrice des affaires institutionnelles et européennes, Vivendi

Mme Anne-Marie FOWLER, auteur, enseignante et consultante

M. Aaron FRANK, *Business Development Manager*, Singularity University

M. Thibaud FURETTE, adjoint au chef de l'unité marché des services de capacité de la téléphonie fixe, Autorité de régulation des communications électroniques et des postes

Mme Maïté GABET, directrice de la Direction de vérification des situations fiscales, Direction générale des finances publiques

M. Emmanuel GABLA, membre du collège, Conseil supérieur de l'audiovisuel

M. Eric GARANDEAU, président, Centre national du cinéma et de l'image animée

M. Alexandre GARDETTE, chef de service, Direction générale des finances publiques

Annex 2

M. Nicolas GAUME, président, Syndicat national du jeu vidéo

M. Edouard GEFFRAY, secrétaire général, Commission nationale de l'informatique et des libertés

M. Ari GESHER, *Senior Software Manager*, Palantir Technologies

M. Marc GIGET, fondateur, Club de Paris des directeurs de l'innovation

Mme Claire GIRAUDIN, chef de cabinet, Société des auteurs, compositeurs et éditeurs de musique

M. Jean-Baptiste GOURDIN, administrateur, Mission « Lescure » sur l'Acte II de l'exception culturelle

M. Olivier GREVOZ, directeur comptable et fiscal, Bouygues Télécom

Mme Delphine GRISON, directrice générale du numérique, Lagardère Active

Mme Elisabeth GRODHOMME LULIN, présidente, Paradigmes et caetera

M. David GROSZ, secrétaire général et directeur juridique de la division contenus, Groupe France Télécom Orange

M. Bertrand GSTALDER, directeur général, Fnac.com

M. Christian GUENOD, conseiller du président, Autorité de régulation des communications électroniques et des postes

M. Olivier GUILLEMOT, directeur financier, Centre national du cinéma et de l'image animée

M. Etienne GUILLOU, avocat associé, Salans

M. Aymeril HOANG, conseiller technique, cabinet de la Ministre déléguée chargée des petites et moyennes entreprises, de l'innovation et de l'entrepreneuriat

Mme Emmanuelle HOSS, conseillère du Maire de Paris, Ville de Paris

M. Stéphane HOYNCK, directeur général adjoint, Autorité de régulation des communications électroniques et des postes

M. Xavier HUBERT, conseiller juridique, cabinet du Ministre du redressement productif

M. Tom HUTCHINSON, *Tax Director*, Google

M. Salim ISMAIL, *Chief Executive Officer*, Singularity University

M. Matthew O. JACKSON, professeur, Stanford University

M. Olivier JAPIOT, secrétaire général, Conseil supérieur de l'audiovisuel

M. Renaud JAUNE, maître des requêtes, Conseil d'Etat

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