ARTIFICIAL INTELLIGENCE & TRANSFER PRICING: THE FUTURE OF INTERNATIONAL TAX PLANNING

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Thesis framework and acknowledgements

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Summary

Introduction

Multinationals are facing multiple threats that affect their business model in the XXI century. The digital revolution is part of these challenges as a source of increased social responsibility combined with transparency. For decades (1980s – 2008)[1], multinationals were using new technologies to expand internationally through aggressive tax planning. In a post subprime mortgage crisis era (2008 – 2019)[2], States found themselves impecunious and saw in the struggle against international tax evasion a good way to tackle populism, public deficit and the collective perception of tax unfairness highlighted by NGOs. So the OECD (Organization for Economic Co-Operation and Development) launched in 2013, under the initiative of the G20, the Base Erosion and Profit Shifting (BEPS) project. This period was then marked by the beginning of the use of algorithms and the exploitation of digital data against multinationals, to tackle their tax optimization. Now, the OECD, is suggesting a new way to tax digital business models, by consolidating its soft law in guidelines for multinational enterprises and tax administrations[3], and by publishing articles and consultations on the topic[4]. Meanwhile, tax administrations are starting to use algorithms and data mining against multinationals to cleverly challenge their new business models and tax schemes[5].

In this context, multinationals are undergoing the aggressiveness of tax administrations. It is obviously legitimate that all corporations contribute to the political organization of the states in which they are able to create value. It could also certainly be argued that the BEPS project aims precisely to restrict the use of very low-tax jurisdictions, so that tax revenues increase automatically in high-tax countries, which can then reduce their own taxes, after recovering their resources. However, as Montesquieu said in his Book XX of the Spirit of the

[1] The 1980 – 2008 period of free-market started with Ronald Reagan election and finished with the Lehman Brothers bankruptcy.

[2] The 2008 – 2019 period of increased regulation started on the altar of the financial crisis and has led to the return of protectionism under the mandate of Donald Trump.

[3] OECD, Transfer pricing guidelines for multinational enterprises and tax administrations, July 2017.

[4] OECD, Public consultation on the tax challenges of digitalisation, 2019.

[5] EY, Tax authorities are going digital, 2017.

Laws, “the natural effect of commerce is to bring peace”, and it is exactly the possibility of using very low-tax jurisdictions, such as the Cayman and Bermuda Islands, the British Virgin Islands, Jersey, Panama, Hong Kong, Luxembourg and Delaware to name only a few, that allows multinationals to capitalize on their profits so that the company or its shareholders can, in the end, reinvest these funds wherever they want. It is the whole question of whether individuals are better positioned than the State to determine where to invest the money they have legitimately acquired, and it is the frontier between jurisdictions with a socialist bias and those with a capitalist one.

In this respect, the aim of this thesis is not to promote tax evasion but to provide the keys to understand and build on what a digital tax strategy can mean for a multinational group, so that it is no longer a risk but a shield and then a new added value. Because in no more than ten years, tax administrations could be allowed to carry out an automated day-to-day control over the financial transactions of international corporations. Therefore, without a digital tax planning organization and without a robust automated monitoring of their activities around the globe, multinationals are going to be penalized both by governments through tax administrations and by society through consumers.

International tax planning is now mostly composed of two parts: transfer pricing and artificial intelligence. Transfer pricing is meant to value transactions between affiliated enterprises of a multinational company “by seeking to adjust profits by reference to the conditions which would have been obtained between independent enterprises in comparable transactions and comparable circumstances” [6], which is the core of the current international consensus called the “arm’s length principle”. Artificial intelligence is considered[7] as a branch of computer science dealing with the simulation of intelligent behavior in computers and the capability of a machine to imitate intelligent human behavior. For now, in 2019, the tools used by transfer pricing professionals in their day to day tasks are still based on computer programs that are mainly dependent of human input.

[6] OECD, Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations, July 2017.

[7] As defined by the Merriam-Webster dictionary.

However, since the second decade of the XXI century a real beginning of artificial intelligence has emerged and is radically changing our societies: it operates with immense databases, machine learning and increasingly autonomous artificial neuronal systems. Although it is necessary to look at the whole range of existing digital tools to understand the challenges of the current digitization[8] of the tax function, artificial intelligence is what will truly digitalize the tax function by revolutionizing both transfer pricing professionals' activity and international tax planning.

International tax planning is often accused of causing all the world's ills. Many NGOs like OXFAM in France and the "Tax Justice Network" in the UK are also very active on the topic, claiming that inequalities and poverty are directly caused by unequal tax systems. Not to mention that the "Panama Papers", the "Swiss leaks" and the "Lux leaks" scandals[9] have damaged the image of international tax planning, but also its practice, practitioners, and the image of multinationals. The OECD also has an entire website page dedicated to "Aggressive tax planning", and even newspapers like the Financial Times have their own section "Tax evasion and avoidance". In this context, the right to tax optimization and to not pay more tax than is owed is generally remembered by tax experts. It is even an obligation for the management of a multinational company, which operates in an extremely complex and competitive environment. In France, this fundamental right to tax optimization – within the limits of the legal framework – has been recognized by the Constitutional Council[10] in 2013, when the so-called "wise elders" censured a law requiring any person commercializing or developing and implementing a tax optimization scheme to declare it to the administration before its commercialization or implementation, having regard to the restrictions imposed on the entrepreneurial freedom and, in particular, on the conditions under which legal and tax consultancy activities are carried out.

[8] It is necessary to distinguish "digitalization" that refers to an organization becoming digital and adopting new working paradigms, and "digitization" that is limited to the paperless transformation.

[9] France 24, "Panama papers", "Lux Leaks", "Swiss Leaks": gros scandales, petits impacts sur les paradis fiscaux (big scandals, small impacts on tax havens), 2016.

[10] Conseil Constitutionnel (Constitutional Council), Decision n° 2013-685 DC 29 December 2013.

However, it appears that the gradual inclusion of OECD guidelines in a growing number of national legislations has so far increased documentation and compliance on mid-sized multinationals without reducing the use of tax havens by large monopolistic groups, so the sole affirmation of the right to opt for the most advantageous tax treatment is not sufficient to convince governments and consumers of its legitimacy. Artificial intelligence could in this regard help establishing transfer pricing policies with objective criteria aligned with the laws, treaties and the consumers' sensibilities. This would allow both to constantly comply with regulations, lowering the tax audit risk, and to take advantage of preferential tax regimes, monitoring their evolutions and their impact on the business on a real time basis to create more value. That being said, the first challenge to achieve these goals is to extract and exploit valuable and qualified data. Big four audit firms like EY (Ernst & Young) already possess an arsenal of tax experts, economists and developers[11] who are assisting companies in their digital tax issues, but entering in a real digitalization of international tax planning would require a real willingness, commitment and investment form the part of multinational companies.

The benefits of a digitalized transfer pricing management for multinationals are infinite. From the interactive visualization of cross-borders flows to the automated adaptation of transfer pricing policies depending on corporate reorganizations and new national regulations, there is an ocean of opportunities. In addition, and as a consequence, the role and responsibilities of tax directors will completely change: they will first have to fight to launch a complete and automated data collection policy into their corporation, but then they will be overwhelmed by a continuous flow of information that will require them to outsource the control and analysis of this unlimited amount of data to large audit and consulting firms, certainly in the form of monthly subscriptions including various options from risk management to advanced tax optimization – which is, by the way, a potential gold mine for tax advisors that will be able to offer a range of services proportional to the amount of data available. As a consequence, tax directors could strengthen

[11] In EY, the Tax Technology and Transformation service has been created to address the issues raised by the digitization of the tax function, to convert it in an opportunity.

their added value within the company since they would be a greater source of proposals for international reorganizations with a potential high added value on cash flows. However, it should be remembered that these opportunities can only be achieved after an initial investment in the digitization of the company's internal data, without which no artificial intelligence can operate.

It is necessary to go even further, since artificial intelligence can only reach the stage of self-education with a considerable amount of information. This implies that data from one single company is not sufficient. The Big Four firms will be in an excellent position to exploit the data of hundreds of multinationals to offer new services, but they will be required to get a contractual consent from each of their clients and governments will undoubtedly be scrutinizing this move. Nevertheless, this ability to carry out cross-data mining on the internal and confidential data of each of their clients - by previously anonymizing it – would make it possible, from a transfer pricing point of view, to challenge effectively the arm's length principle or at least its application, according to which the comparable transactions to be used cannot be extracted from dependent entities. In such a situation – this is only a suggestion – the next question would then be the self-regulation of the sector, which, having its own soft law, would also need to have its own courts, inspired by the effectiveness of international arbitration courts for international trade, which could be considered as perfectly adapted to transfer pricing, given its intrinsically cross-border nature and inseparability from international trade. Especially since the independence of the Arbitration Court from the States, which may be total in international arbitration, particularly in Paris, always has to respect international public order as understood by the jurisdiction, as well as the national and even sometimes international mandatory rules, and this could be perfectly adapted to apply both the OECD guidelines and general tax principles, such as abuse of rights.

Beyond the pure financial profit, the digitalization could also meet the OECD's requirements in terms of corporate governance and CSR. For example, tax breaks are often conditioned on the completion of useful investments for a community or considered as such. However, multinationals do not always know all the tax incentives they could benefit from depending on the countries where

they are - or could be - established and the activity they carry out. But there is a common interest between governments, the group's chief financial officer and the increasing number of CSR investment funds: they all require a continuous and reliable evidence that the CSR and legislative criteria are met in order to benefit from the exemption. Artificial intelligence would first allow in this case to identify and notify faster new tax opportunities through the various inter-jurisdictional reforms, after performing correlations between the new tax provisions, the group's business sector, the internal and external financial data as well as the functional profiles of each entity. First, a low level of artificial intelligence autonomy could be able to alert tax directors more effectively of new risks and opportunities, based on correlations that a human being could not have done or, even better, would not have imagined. But then, a strong artificial intelligence (estimated to be in a position to emerge in the second half of the 21st century[12]), would be able to monitor the group's tax policy itself, by autonomously adapting the tax organization to the evolution of the business and functional profiles, but also to the new tax regimes, which will certainly also be codified electronically in such a way by the lawmakers that the artificial intelligence of companies will be able to take it directly into account. Before reaching this point, it is possible to have during the next decade an artificial intelligence capable, on the basis of criteria established and monitored by human beings, of having a certain autonomy to adapt the functional profile of entities to economic reality and taxation changes. It would also improve, for example, the remote monitoring of financial performance and compliance with the tax exemption and CSR requirements. Through this example, it is possible to see how artificial intelligence and international tax planning could evolve in a short time from the digitization of the tax function to the complete digitalization of the multinationals' transfer pricing policies. **This radical shift must be considered in more detail, questioning the extent to which artificial intelligence will transform transfer pricing, shaping the future of an automated international tax planning.**

Considering the need for multinationals to overcome tax audit risks and to ensure the strength of their transfer pricing policy, altogether with the emergence of tax

[12] ALEXANDRE L., "La guerre des intelligences" (The war of intelligences), 2017.

authorities' data mining, the first hypothesis is that, by combining their transfer pricing policy with artificial intelligence, multinationals would preserve their ability to defend themselves on an equitable basis (I). The second assumption to consider is based on the fact that both artificial intelligence and transfer pricing, as human beings' creations, are not only meant to reduce risk even if it is the first achievement to be accomplished. From then on, this thesis will explore the disruption of the transfer pricing function through artificial intelligence to generate additional value (II), by reducing routine costs and increasing international tax planning profitability while ensuring a day-to-day compliance to be able to anticipate and face public opinion and tax authorities at all times.

I. Overcoming digitalized tax audits threats by applying artificial intelligence to transfer pricing

Many factors have recently weakened multinationals in their relations with tax authorities: the accessibility of online information, the digitalization of tax audits, the international exchange of information between tax authorities, the promotion of whistleblowers and the divisive curiosity of journalists seeking scandal at all costs, but also the spotlight placed on tax issues, the increasingly high demand for transparency, and finally the fierce international competition that requires in parallel to continue the profit maximization to satisfy financial markets' needs: this is a double-edged risk that must be reduced to ensure the sustainability of the business.

In addition, tax authorities are no longer playing on equal terms: the data mining they carry out with an ability to cross-reference information means that multinationals now rely solely on the argumentative skills of their tax advisors and above all on the benefit of the doubt, given the significant burden of proof that is still, in France, on the tax authorities. The Council of State (Conseil d'Etat) in the Cap Gemini[13] case considered that the French Tax Authorities are entitled to invoke the presumption of transfer of profits under Article 57 of the French General Tax Code (Code Général des Impôts) only if it has realized a comparison between the prices charged by a foreign company to a related company established in France and those charged by similar companies which operate on a normal basis. This reasoning is followed notably by the Paris Administrative Court of Appeal[14], or the Versailles Administrative Court of Appeal[15]. The latter specify that "it is up to the administration, which bears the burden of proof of the existence of advantages granted by the company, to establish in which way the methods and elements of comparison it proposes to demonstrate the latter are relevant".

[13] CE (Council of State), 7 November 2005 n° 266436 et 266438, 3e et 8e s.s., min. c/Sté Cap Gemini.

[14] CAA (Administrative Court of Appeal) Paris 25 June 2008, n°06-2841, 2e ch., Société Novartis Groupe France SA.

[15] CAA (Administrative Court of Appeal) Versailles, 3ème ch., 5 May 2009, n°08VE02411, Man Camions et Bus.

However, the burden of proof on the tax authorities tends to be reduced as soon as the State considers that the foreign subsidiary is benefiting from a preferential taxation (see, for example, the restrictive evolution of Article 209 B of the General Tax Code – *Code Général des Impôts* - in France). Therefore, there is a downstream need for multinationals to apply artificial intelligence to transfer pricing to anticipate and overcome digitalized tax audits (A), and an upstream responsibility for tax directors to secure their transfer pricing policies through artificial intelligence (B).

A. The need for multinationals to apply artificial intelligence to transfer pricing to overcome digitalized tax audits

The intensity of the tax audits' digitalization depends on the country but is undoubtedly representing an increasing threat for transfer pricing policies (1) and is leading to the advent of tax authorities connected in real time to the transfer pricing policies of multinationals (2).

1. The digitalization of tax audits threatening transfer pricing policies

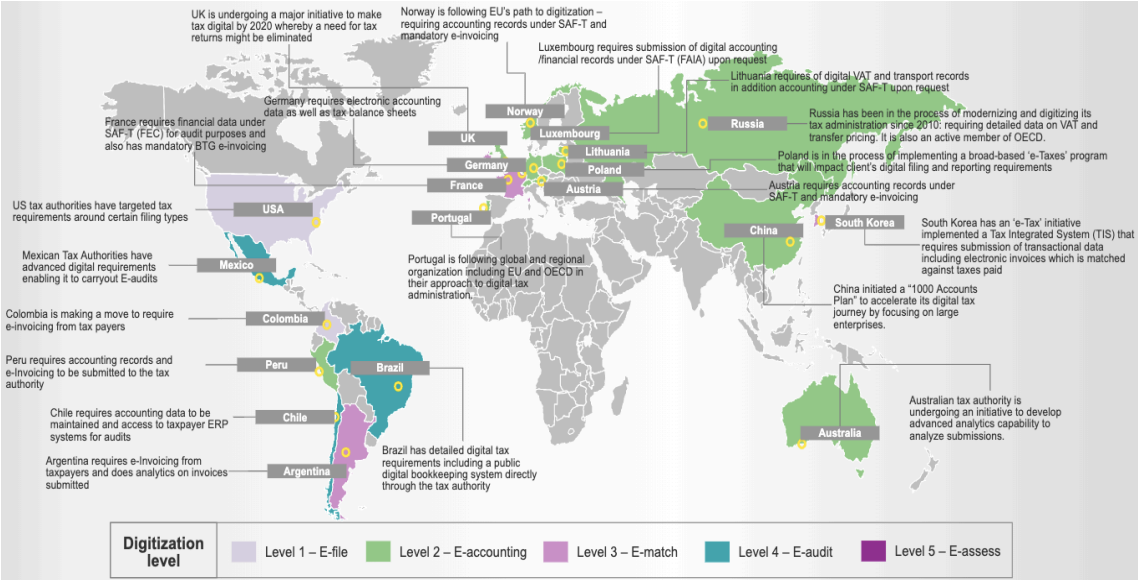
Five tax authorities' digitalization levels have been identified by EY[16]: 1) e-filing, 2) e-accounting, 3) e-match, 4) e-audit and finally 5) e-assess. The first step is the digitization[17] of the tax filing process, and most of developed countries have entirely or at least partially resolved this simplification challenge. The second step is still part of a pure digitization process, and its aim is to dematerialize the accounting and all the accompanying proof, including invoicing evidence. As a consequence, the relation between taxpayers and tax authorities changes: more information is available and it is possible to compare it with the one given or asked to third parties, including banks or other companies of the sector. The use of this source of data to cross-check and realize tax audits on this basis is the third step of e-match: it implies that the government has access to additional accounting data, bank statements data from different jurisdictions, details of relationships

[16] EY, Tax Technology and Transformation, "Tax functions go digital", 2017.

[17] It is necessary to distinguish "digitalization" that refers to an organization becoming digital and adopting a news working paradigms, and "digitization" that is limited to the paperless transformation.

with third parties, intercompany transactions, etc.[18], and starts to match data across its own analytical research platforms gathering data from all the previously audited companies. The fourth step of e-audit is reached when tax authorities are able to industrialize this data mining analysis and multiply the tax audits realized on its results: taxpayers at this stage receive electronic audit assessments with limited time to respond. The fifth step of e-assess will imply that the government is literally plugged into the multinationals accounting and tax systems to cross-check the flow of information in real time: the "tax partnerships"[19] initiated by the French government in 2019 as part of a new " trustful relationship" involving a transparency whose limits are still to be clarified, are a step in this direction. In this respect, the digital transformation of the sector is going fast and is inevitable for multinationals. The following cartography is an international comparative analysis carried out in 2017 by EY that shows that any large multinational is already facing the digitalization of tax audits.

Key examples of tax authorities' digitization level across the globe in 2017[20].



[18] For more information, please refer to: EY, "Tax authorities are going digital", 2017, especially p. 2 and 3.

[19] Capital, "Douze entreprises inaugurent les partenariats fiscaux" (Twelve companies are opening the tax partnerships), March 2019.

[20] EY, "Understanding what digital means for EY", February 2017 (the grey color does not necessarily indicate an inferior level, this cartography is focused on key examples).

In 2019, French Tax Authorities (FTA) could now – in some aspects – be classified in the e-audit level. First of all, since 2014, a team of 20 developers, tax specialists and big data experts is part of the FTA to assemble data from 5 million companies in an important database (in the Sully building, near *Gare de Lyon*: there is the data mining cell named "request and valuation mission" – *MRV* for *Mission Requête et Valorisation* in French)[21]. The French Tax Authorities' artificial intelligence algorithm is named "targeting fraud and enhancing the value of requests" (*CFVR* for *Ciblage de la Fraude et Valorisation des Requêtes* in French)[22] and various private companies assist the FTA, like Linkurious, a graph visualization and analysis platform that fraud, intelligence or cyber analysts use to detect and investigate threats in large and complex datasets[23]. To be known and trained, this French start-up offered its services for free to the group of journalists who published the Panama Papers investigation. French Tax Authorities have also been working with the French start-up Semsoft to realize data fusions and obtain qualified data to use for big data research leading to tax reassessments. The FTA also engaged the American-Swedish company Neo4J, which is specialized in uncovering networks of tax evaders and their potential advisors, to reveal hidden links between different companies or individuals, including internationally, and the nature of their relationships.

It would be interesting to determine whether this type of cross border contractual relationship between the FTA and foreign companies would now fully respect the spirit or even the letter of the General Data Protection Regulation of April 27, 2016, effective since May 25, 2018. Certainly, the arguments related to the fight against tax evasion would certainly prevail before the judge, as demonstrated by the deliberation of the CNIL n° 2015-186 of 25 June 2015 (Official Journal of 29 September) which considered that the data mining system previously mentioned is surrounded by strong guarantees likely to ensure a high level of data protection, guarantees and the freedom of individuals. But this deliberation was about an algorithm – the above-mentioned *CFVR* – developed by and under the control of

[21] Nouzille V., "Comment le fisc vous espionne" (how the FTA are spying on you), *Le Figaro Magazine*, 25 January 2019.

[22] La lettre mensuelle des affaires, "Comment se déclenchent les contrôles fiscaux" (How tax audits are triggered ?), June 2016.

[23] https://linkurio.us

the government. However, in the case of the American-Swedish company Neo4J, it would be naive to believe that the United States could not obtain an access to the French taxpayers' data thus transferred and possibly use it as a leverage in future international trade negotiations. What has been outlined gives a foretaste of the extent to which French tax authorities could use artificial intelligence in the future to tackle international tax planning and demonstrates that if the fourth level of e-audit is may be not totally reached, tax authorities' aim is to reach it.

Nevertheless, the amount of data collected by the FTA does not always reflects the reality of the business activity. For example, in an experienced case, tax authorities had cross-checked the organizational charts and job descriptions provided by a multinational during a tax audit, with the public content available on the LinkedIn profiles of approximately one hundred managers and employees to demonstrate that the entrepreneurial activity was carried out in France instead of in the lower tax rates country, basing its reasoning on the content of the LinkedIn profiles. But is this really bringing the burden of proof relying on the tax authorities? Which type of data is reflecting the reality? The organizational chart and job descriptions provided by the company or the LinkedIn profiles of some of the managers and employees – whose purpose, in this social media, is to attract the attention of head-hunters by in many ways exaggerating their responsibilities or territorial scope? Which information should the judge take into account? There is no definitive answer to these questions. However, two certainties can be identified: first, multinationals are at greater risk in their transfer pricing policies because of this new digital surveillance ; second, the increasing available data online allows the administration to artificially create an unfavourable set of indicators that is *de facto* reversing the burden of proof on the taxpayer who will at least have to give its version of the facts and demonstrate that the tax authorities' analysis is wrong or is not supported by an adequate evidence: even if it would not be sufficient for a judge to allow a tax reassessment on this unique basis, getting before the judge would already be a serious threat to the reputation of certain companies whose image is the very core of their business.

With the implementation of international exchanges of information between tax authorities, tax authorities will be increasingly connected to the whole group's financial, contractual and business information. After the digitization of this flow of information into qualified and exploitable data, the fifth level of e-assess will be very close but will require a direct connection between tax authorities and the company's information systems.

2. The advent of tax authorities connected in real time to the transfer pricing policies of multinationals

In a short while, tax authorities could be allowed by the law to connect directly to companies' accounting and invoicing, but also to have a digitized access to a wide extent of supporting documents related to transfer pricing methods. This would immediately raise a number of constitutional questions, but the French government has already found a much simpler path: the implementation of an in-depth cooperation based on voluntary participation, called the "Tax partnership". If we take into consideration that, under Article L13, IV, of the French Book of Tax Procedures (Livre des Procédures Fiscales), "when the accounts are held by means of IT systems", French tax audits already cover "all information, data and computer processing which directly or indirectly contribute to the formation of accounting or tax results and to the preparation of declarations made mandatory by the General Tax Code, as well as documentation relating to the analysis, programming and execution of processing"; it is conceivable that the new "tax partnership" introduced by the French government, which implies a constant transparence, could be a Trojan Horse for the permanent monitoring of multinationals' transfer pricing policies.

The implementation of this in-depth cooperation started in 2019 in France: the "tax partnership" is a mechanism designed to inaugurate a "new relationship of trust" with the administration[24]. Inspired by current practices in the United Kingdom and the Netherlands, these partnerships are one of the practical

[24] Ministère de l'action et des comptes publics, "Entreprises et administration fiscale : une nouvelle relation de confiance", dossier de presse (French Ministry of Public Finances, "Business and Tax Authorities: A New Relationship of Trust"), March 2019.

translations of the "right to make mistakes" for companies. It also enables the applicant companies to obtain a definitive position from the administration on complex tax issues that may raise a financial or legal risk. Therefore, this type of partnership will allow the participating companies to reduce their tax audit risk and also reduce their related provisions in the financial statements. In a government perspective, it is also an opportunity to reduce the number of tax inspectors[25] by facilitating the automation of the tax audit process and reducing expenses while preserving the same tax burden, which could be seen as a good administration. However, the other side of the coin is the almost total transparency on the part of the company: it will be required to provide spontaneously the information, analyses and internal and external documents at its disposal that could contribute to the quality and efficiency of the permanent audit carried out. To this end, the tax authorities will be able to examine the relevant elements of the accounting records file and the company will have to provide tax authorities with the related documents requested.

After a few years of implementation, this process may be digitalized and extended to all companies in the name of major principles such as trust or equality before taxation. In this case, the administration will require real-time digitized access to cross-border transactions and transfer pricing methods. This will undoubtedly be a new legal requirement. Therefore, multinationals enterprises must now assess two alternative costs: that of setting up an internal digitalized control of their transfer pricing policies that would be ready to be transmitted via remote access to the administration; or that of being required to provide in some years a real time SaaS[26] access for the administration to the company's databases that may include data that was not fully controlled and analyzed before being uploaded or even contrary to the chosen transfer pricing methods, forcing the company to negotiate a new transfer pricing policy in a very vulnerable position. Some companies have already opted for the first option to have a better overview and control over their internal data to secure their transfer pricing policy and

[25] Challenges, "Le fisc passe à l'intelligence artificielle pour traquer les fraudeurs" (The FTA are adopting artificial intelligence to track down tax evaders), February 2019.

[26] Software as a service (SaaS) allows users to connect to and use cloud-based apps over the Internet (Microsoft Azure definition).

eventually adapt it to the evolution of their business model. For example, EY provided some companies with the digitalization, mapping and remote monitoring of all their intercompany transactions and transfer pricing methods. This allowed recently a multinational group to anticipate risks that were not perceptible for human beings because of the amount of data to analyze and the tax director could correct the chosen well before an auditor could send an adjustment notice. However, the gap is now significant between a group that is not digitalizing its transfer pricing policy and exposes itself to all tax audit risks, and a group that increase its ability to avoid risk by identifying non-compliant situations through a digital overview and monitoring of its internal financial data, ensuring both compliance and optimization. Looking at this evolution and at the increasing digitized scrutiny carried out by tax authorities and NGOs, it is possible to anticipate that tax directors will need during the next decade to secure their transfer pricing policies through artificial intelligence to overcome the digitalization of tax audits.

B. The responsibility for tax directors to secure their transfer pricing policies through artificial intelligence

The responsibility for the digitalization of transfer pricing policies could not reasonably be assigned to the sole person of the tax director of the company. The role of the major audit and consulting firms will therefore take on an additional role - through their international experts' networks and technological expertise – in collaboration with the tax departments of multinationals. At the moment, many highly effective digital tools remain unused by multinationals (1) and that is no longer sustainable given the increasing inclusion of BEPS in national legislations, but this issue should be addressed by the co-development of tailor-made and mature tools for transfer pricing (2).

1. The existing digital tools for transfer pricing

It has to be pointed out that transfer pricing professionals already work extensively with digital tools. First of all, all deliverables and interactions with customers are based on or rely on the computer: Word, Excel, Power Point,

Internet, E-mails, Skype, etc. This seems obvious, but the current bionic service delivery was not a reality fifty years ago. This corresponds to the digitalization of the entire economy. In the same sense, there are all the public or private databases and research engines used by legal and tax professionals. For example, in France: Légifrance, BOFIP, Navis, Lexis360, Lextenso, Doctrine, Predictice, etc. Finally, transfer pricing professionals use more specific tools on a daily basis: Diane and Amadeus[27], especially for Benchmarks, but also Xerfi[28] - among others - for market studies, without mentioning all the internal tools to each organization and those made available to the wider public on Google. All these tools are based on algorithms that reproduce and multiply human intelligence and its work of classification, research and choice between different options. However, while these above-mentioned digital tools – remaining at the level of digitization – have been widely integrated into practice, the following ones that are to be further explored are not yet completely integrated despite their apparent benefits.

The tools that already exist for transfer pricing but are not yet being fully used include the following automated services: creation of transfer pricing documentation, determination of the clients' entities tax risk profile, verification of the accuracy of tax declarations to tax authorities, real-time alert system for permanent establishments, real-time surveillance of tax relevant transactions, clear representation of key figures and tax data analytics platforms, calculation of the stake and the amount of additional taxation with an integrated follow-up of

[27] Diane and Amadeus are databases published by Moody's Analytics - Bureau van Dijk that provide finance and marketing professionals with an instantaneous access to financial information and capital links of French (Diane) and European (Amadeus) companies for economic analysis. Transfer pricing professionals use it to realize financial demonstrations and benchmarks of comparable entities.

[28] Xerfi is the leader in sectorial economic studies in France, these studies contain the monitoring of market and competition trends, and the analysis of companies' strategies and performance. Transfer pricing professionals use it in particular to update transfer pricing documentation and to justify, in the event of a tax audit, the transfer pricing methods applied in the light of market conditions and competition.

local legislation[29], generation of standard contracts and documents[30], etc. More than just gadgets, these programs allow the tax director in collaboration with his audit and consulting firm to access and understand multi-country data that is usually drowned in the group's internal programs, using interactive dashboards to improve insights into existing data, and using statistical analysis to create predictive models to address future decisions. These resources allow the tax director[31] to directly identify areas of opportunity and risk by pointing out data anomalies and values beyond risk thresholds, by detecting possible after-tax profit optimization or highlighting specific data scenarios.

If all these available services are not yet fully incorporated into transfer pricing practice and if many multinationals do not change their models until a tax audit is carried out, it is may be because this multitude of tools is not sufficiently integrated, does not produce enough value in itself, or is not yet fully effective. However, the real cause has little to do with the quality of the existing services. In reality, the major problem is either the absence of qualified data or the lack of willingness within the group to share the data from all entities and consolidate them. This implies a drastic change in the functioning of the organization as it is a prerequisite for the installation of a new software, because without data, there is no data analysis, and even less an automation of data analysis. The central question is whether it is always better to increase transparency within the group, and the answer leads to two different solutions: knowing the existing risks

[29] In an experienced case, one EY client was able to integrate all its financial transactions into an interactive dashboard and a cartography updated with the financial statements that also represents, according to the chosen visualization criteria, the tax rates applied by type of transaction, entity and country. Then, transfer pricing methods are modified, if necessary, on the software, and local tax rates are updated annually.

[30] The generation of standard transfer pricing documentation is already being used, for example, in African jurisdictions where for a same company the deadlines to file the TP documentation for 50 subsidiaries in 20 different countries can be at the same date or during the same month, which would be very much more expensive to deliver without this EY tool called “TP web”. Regarding the generation of contracts, some effective tools are available but are not widely used yet in transfer pricing because of the flexibility, simplicity and efficiency of Word, but some firms like the French Legal Tech Seraphin.legal developed interesting tools of totally automated creation of contracts whose creation, negotiation – wording propositions – and signing is fully digitized from the filling of a form - to fill in the selected fields – to the online signing.

[31] Although these tools are developed and offered by the big four firms, data analysis and modeling cannot be fully outsourced to them, as the tax manager is in the best position to know and ensure that the multinational's interests prevail. In addition, the lack of strategic guidance by the tax director could lead to a new Enron scandal, which is undesirable. Consequently, it is to be expected that these tools will strengthen the role of the tax director (who will also become a tax data scientist), and that otherwise, it would be taking the risk of an uncontrolled autopilot.

detected through data analysis - visualization and deciding whether or not to act to reduce them; or avoiding a knowledge of them and letting the administration discover them during an audit. Therefore, adding artificial intelligence to the set of existing tools could be the extra service that is missing to really make a difference.

2. The artificial intelligence tools to develop for transfer pricing

The advantage of transfer pricing is that by being halfway between law and economics, it is at the heart of any business reorganization project and therefore in the middle of each company's digital transformation. Some artificial intelligence tools for business are therefore also international tax digital tools, and vice versa.

In that sense, and even more with the increasing challenge of localizing the different components of the Intellectual Property value chain with the DEMPE functions (Development, Enhancement, Maintenance, Protection and Exploitation of intangibles) in an increasing digital economy, it is necessary for a multinational enterprise to be able to map the wide range of incentives for research and innovation that countries make available. But this mapping would only be interesting if it is automatically updated and includes notifications on the latest changes in national and transnational legislation that may impact the business models put in place. The development of Regtech (Regulatory Technology) and Fintech (Finance Technology) must be closely followed by transfer pricing professionals: for example, the French Startup SESAMm[32] helps predict financial markets movements by using big data, natural language processing (eight languages including Japanese and Chinese), machine learning and quantitative analysis. Concretely, this Fintech analyses millions of messages and publications in real time, from more than 250,000 data sources (media, social networks, forums, blogs, etc.) to provide traders with investment indicators depending on the emotions that affect the financial markets, to benefit from the

[32] https://www.sesamm.com/ SESAMm raised 2.6 Million Euros in March 9, 2018 and 4.4 Million Euros on April 4, 2019. Its technology is used by more than thirty clients, including Société Générale and Groupama Asset Management in France.

financial markets turmoil due to, for example, the Donald Trump's tweets, the Brexit negotiations or the arrest of Carlos Ghosn.

The Regtech sector[33], in turn, rely in particular on Big Data to cross-reference large volumes of data and thus automate the generation of increasingly numerous and complex financial reports. Regtech start-ups can also carry out real-time controls of internal rules and regulatory requirements with which financial actors are confronted, and they are facilitating risk management through a mapping of regulatory risks and a real-time update of the standards used. However, one of the major difficulties for Regtech start-ups[34] resides in the feasibility and cost of setting up such a compliant organization due to the heterogeneity and quality of the data to be processed. Most companies use their own standards and the data to be integrated is sometimes very heterogeneous. In addition, each regulatory authority requires reporting on different perimeters and there is also the question of privacy because financial information is intrinsically sensitive and subject to disclosure obligations.

In transfer pricing, an essential part of the job is to conduct functional analyses. This allows the precise identification of the different components of the value chain within the group (who decides, who holds the assets, who uses them, who bears the risks, who develops the intangible assets and what is the contribution of each entity to the group's value creation). This traditionally requires numerous interviews with key actors in the company, in particular to adapt transfer pricing documentation and the methods chosen to ensure they correspond to the functional profile of each entity and to the effective functioning of the value chain. The digitalization of the functional analysis process would make possible, once all the factors have been established, to constantly evaluate whether there are significant gaps or dysfunctions between the method applied and the functions actually performed by the entities of the multinational group. To achieve this digitalization, there is not a unique existing software, it would be necessary to

[33] An overview of the French Regtech startup is available on the following website: https://www.maddyness.com/2018/12/05/panorama-regtech-startups/

[34] Wavestone – Bankobserver, "Regtech, les Fintech de la conformité ?" (Regtech, the Fintech of compliance?), May 2016.

assemble various existing tools such as visualization and mapping tools as well as data analysis tools, and integrate this flow of data within the automation tool of transfer pricing documentation. This would result in a tailored automatic annual update of the transfer pricing documentation, by updating with the use of APIs[35] the data related to the market and value chain analysis, to credit ratings, benchmarks, etc., and by designing the appropriate criteria for the automation of pre-decisions to change the transfer pricing methods and allocation of residual profit.

Regarding the tax audit risks, the main difficulty is to recover the data from the client and all its entities around the world. In contrast, tax authorities do not hesitate to use international information exchange to collect information, for example, on marketing activities – to take an experienced case - from as many subsidiaries as possible (nearly 80 in this case) to see who has the effective initiative and bears the entrepreneurial role. Here again, a digitalized transfer pricing policy would be able to anticipate this type of request, each transfer pricing method being justified by algorithms and supported by an automatically updated functional analysis and transfer pricing documentation. This would indeed be ideal situation, but it is just a matter of time now to apply the Fintech and the Regtech innovations to transfer pricing, because the addressed issues are identical: regulatory inflation, reporting for which all the data to provide the authorities with is not under a reasonable control, and a constant shift in regulations on a country-by-country basis that must be monitored on a daily basis through the follow-up of internal practices and tailored legislative watch. Such a set of digitalization tools would then provide multinationals with a wave of additional services, from the identification of tax risks to the provision of planning opportunities based on artificial intelligence, which could disrupt the transfer pricing function and generate additional value.

[35] API is the acronym for Application Programming Interface, which is an intermediary software that establish connections between several applications and allow them to interact and exchange data (MuleSoft definition).
For examples of how APIs can be used, please visit: https://www.mulesoft.com/platform/enterprise-integration

II. Disrupting the transfer pricing function through artificial intelligence to generate additional value

The disruption of transfer pricing practice will imply imagining what artificial intelligence would be able to bring in terms of added value. Artificial intelligence is understood as a program capable of learning itself and then reproducing, or even learning on its own, and thus finding interesting information over a large volume of data, reasoning by inductions from a data pool, identifying trends, deciding independently to investigate certain points and making correlations that a human being would never have thought about or could not have seen.

Innovation will come from companies as well as from States: it is necessary not to underestimate the significant effects that a more efficient and targeted state tax system could have because it would be based on better data, with perhaps a move towards a personalization of the tax system, partially challenging the principle of equality before tax, as it is already possible to observe with the "GAFA tax"[36] bearing not the name of a minister, as usual, but the name of four publicly targeted companies.

It is therefore necessary to be prepared for this paradigm shift, and in order to take advantage of the opportunities offered by artificial intelligence to multinationals and their advisors in a complex international tax system, it is necessary to identify value creation opportunities (A) and the corresponding new roles and responsibilities that would result from them (B).

A. The value creation of a digitalized transfer pricing policy

The value creation potential of a digitalized transfer pricing function can be considered with respect to an improvement in the cost-effectiveness of routine operations (1) and a maximization of the profitability related to international tax planning (2) that an adequate use of artificial intelligence could lead to.

[36] Le Figaro, “Taxe GAFA : la France imposera les géants du numérique à partir du 1er janvier 2019” (GAFA tax: France will tax digital giants on January 1, 2019), December 2018.

1. The cost-effectiveness of transfer pricing routine automation

First of all, there are tax reporting tools developed by EY that make it possible to report data based on accounting, there is a "Tax control framework" tool that makes it possible to monitor tax audits, to know if subsidiaries have made their declarations, what declarations they still have to file, etc. This stage of development already allows the parent company to reassign the risk to its subsidiaries, as the software contains the timetable and deadlines for the declarations to be made. This has a positive effect on the risk incurred by the parent company and the digitalization of this tax filing coordination function makes it possible to reduce the structural costs inherent to the tax department but also to the company's advisors. In addition, the automation of declarations could be used to further reduce the cost base and to digitize as much as possible the replies to reassessment notices from tax authorities in order to strengthen the computerized justification of the transfer pricing policies applied: for example, a previously educated artificial intelligence that would be able, on the basis of a reassessment notice, to independently search for contrary arguments in the internal database previously prepared would reduce the costs allocated to the development of the arguments by the company's attorneys. In the same context, an artificial intelligence which would itself have fixed a transfer pricing method on the basis of its experience and correlations between functional profiles and types of margins would be able to provide an algorithm justifying the accuracy of the chosen method, leaving the tax authorities at a disadvantage with regard to such an algorithm, the onus being on them to prove its inaccuracy and to build another one which would demonstrate the opposite. The positive effect on costs in this particular case would potentially be the pure absence of tax reassessment, using an algorithm that would be acting as a tax shield.

Regarding functional analysis interviews, a tool developed by EY, based on Natural Language Processing and machine learning is able to save the time spent taking notes and formalizing them. In fact, this new tool is intended to take note of everything said during the interview before automatically issuing a report and even drawing initial conclusions, adding tasks to the to-do lists of identified persons and even after that, on the basis of artificial intelligence, independently

seeking solutions to the legal, financial and tax issues that have been raised, in order to orient the research on the basis of both the internal and external existing knowledge. Applied to functional analysis interviews, this type of tool could be able not only to transcribe the conversations and formalize them, but also to start preparing the value chain analysis deliverable by assembling and enriching the information regarding the selected functions, entities, countries, organization charts, etc. In this specific case, it should be emphasized that this would be a large part of the work that would be pre-executed, allowing transfer pricing professionals to focus on finding the best international tax planning opportunities.

In addition, artificial intelligence is already able, after being educated on the basis of an important data set, to recognize risk structures and potential cost-savings opportunities within an accounting system. If this type of technology is linked to a transfer pricing documentation, it is possible to imagine that the artificial intelligence would propose, on the basis of the irregularities it identifies (for example: the unusual evolution from a fixed margin to a variable margin, potentially indicating a change in the functional profile in practice), an adaptation of the wording used in the transfer pricing documentation. This would reduce the risk of reassessment and make more efficient the services of transfer pricing consultants. Nevertheless, since these tools would potentially contribute to the formation of the results, the administration will be able to obtain them[37]. Given the complexity of the system, however, this would make it possible to restrict the discussions to arbitrations made by the tax directors on the basis of irregularities insights sent by artificial intelligence, leaving the conformity analysis of transfer pricing method determination to algorithms experts' reports. A tax referral procedure could even be imagined to refuse the provision of artificial intelligence algorithms to tax authorities in the absence of a set of indications of bad faith on the part of the taxpayer.

[37] As mentioned before, under Article L13, IV, of the French Book of Tax Procedures (Livre des Procédures Fiscales), “when the accounts are held by means of IT systems”, French tax audits already cover “all information, data and computer processing which directly or indirectly contribute to the formation of accounting or tax results and to the preparation of declarations made mandatory by the General Tax Code, as well as documentation relating to the analysis, programming and execution of processing”

Another example, this time in the field of VAT (Value Added Tax), could also be of interest for the digitalization of transfer pricing: automated PAF (Pistes d'Audit Fiables – Reliable Audit Trails) analyses were carried out by EY, to automatically alert the tax director of potential risks in the VAT supplier database. The process consists in performing an Excel extraction from the supplier table, with an artificial intelligence capable of querying the VIES databases (VAT Information Exchange System) on its own, and to generate an audit in the Excel table to check the suppliers' VAT number, because otherwise the control is often only done at the time the supplier file is created, whereas ideally a blocking test should be applied at each time an invoice is issued or approved. Indeed, this is only relevant for companies with a high level of invoicing, and in the area of VAT, but it is possible to conceive the value creation mechanism. With regard to transfer pricing, this type of mechanism could be adapted to the comparables' analysis process, for example, by obtaining alerts if the comparables justifying the mark-ups applied are undergoing a change likely to modify them, or if the evolution of the staff and functions of an entity identified in databases such as Diane, Amadeus, or even internal systems, can identify a risk for the transfer pricing policy applied. However, although reducing costs related to the daily practice of transfer pricing is interesting and also makes it possible to reduce tax risk provisions in the consolidated financial statements, the real paradigm shift comes with the automation of planning, which is apparently contradictory but which becomes possible with machine learning and artificial intelligence.

2. The profitability of transfer pricing planning digitalization

In the field of artificial intelligence and anticipation, EY has developed a profiling tool that could be of major interest in transfer pricing. This tool makes it possible to determine the risk profile of potential clients in terms of taxation and reputation. In concrete terms, an artificial intelligence absorbs everything that may exist on the web concerning a group, its activities and relations with third parties, and then autonomously produces a report on the existing risks with recommendations. With regard to transfer pricing, tax profiling could be an essential complement in the context of an international acquisition strategy: identifying risk profiles related to the entities subject to M&A projects, or related to the country economic, social

or even environmental factors, would not only avoid wrong investments but also, for example, would be a useful basis to justify the localization of residual profits in a low-tax country based on a tax profile showing a significant number of supported risks. Likewise, it would be possible to alert the tax director in the event of a substantial change affecting the risks borne by the corresponding entity.

Furthermore, an intelligent system that would be fully up-to-date with all national tax laws and would adjust itself automatically as they evolve can hardly still be considered to be science fiction since it is technologically possible to do so. Such an artificial intelligence could be used to develop customized tax optimization schemes by simply plugging a group's financial information into the system. An artificial intelligence would then be able to carry out all the necessary calculations and simulations to be able to propose the most appropriate schemes regarding the group's business model and financial data.

It would also be possible to imagine a tax manager operating without the "human" services of the Big Four firms in only a few years. Such a tax director would have directly access to a Big Four Marketplace, would be able to buy transfer pricing services online and obtain, for example, a benchmark of external comparables for a royalty mark-up without any interaction with a local Big Four partner or manager. Thereby, a tax director in no more than ten years (this is a personal estimation) would obtain its deliverable in an unbeatable time after uploading the financial, legal, economic and tax data required on one of the Big Four Marketplaces. This would save the cost of kick-off calls, services proposals, human errors, while facilitating the outsourcing of the staff needed to review the results of the deliverable provided by artificial intelligence in developing countries with tax and labour cost incentives. The cost of these "à la carte" services would then be minimized, at least, by half, and would be profitable both for companies and for the Big Four firms because this would ensure to the latter an income mainly based on the work of a robot.

Big Four firms also have at their disposal a considerable number of reassessment notices and court decisions that an artificial intelligence could assimilate and correlate with all court decisions available on the web and on specific research

platforms around the world, to identify the existing tax reassessment risks by year, country, type of transaction or type of tax regime, in order to provide their clients with an advice that would summarize a quantity of knowledge that a human being would not be able to collect. This would radically increase the added value of advice in the setting of international tax planning. Similarly, artificial intelligence would be able to better value certain activities in a multinational group by collecting, classifying and valuing the intangible assets created by each entity in the group. Therefore, the automation of the transfer pricing function will not be fully achieved without creating synergies - APIs - with other digitized legal functions, in this case the IP function, and a good example of this is the French start-up About Innovation[38] which provides an interactive dashboard for the entire Intellectual Property portfolio of the company by simply indicating the company's SIREN number (French public registration number for companies) when subscribing, since the start-up has access to a worldwide range of IP databases.

The use of Blockchain could complete this sampling of the future international tax services by offering the opportunity to use smart contracts[39] for the choice of transfer pricing methods to eliminate the costs of coordination, monitoring and enforcement for intra-group compliance requirements, but also to track intercompany transactions and to make payments according to pre-established and arm's-length conditions, when the necessary conditions are met[40]. In addition, intangible assets could be tokenized[41], which would in particular add precision to value chain analyses and optimize the adjustment of margins to the functional profiles of each entity, allowing the emergence of a dynamic, real time and blockchain-based transfer pricing documentation. A transfer pricing policy that would be digitalized to this extent would then entail new compliance issues

[38] https://www.aboutinnovation.com/?lang=en

[39] Smart contracts are one of the most promising types of blockchain use. In practical terms, these are autonomous programs that, once started, automatically execute predefined conditions registered in the blockchain; they work like any conditional instruction of type "if - then": if such condition is verified, then such consequence is executed (Blockchain France definition).

[40] EY, “Blockchain relevant for tax and transfer pricing”, December 2018.

[41] Tokenization is the creation of the digital representation of an asset on a blockchain; in more detail, tokenization refers to the registration of an asset and its rights on a token in order to allow its management and peer-to-peer exchange on a blockchain, in a secure and immediate way (Blockchain France definition).

with other principles than the arm's length one, including those related to Corporate Social Responsibility (CSR).

B. The greater impact of a CSR compliant automated transfer pricing policy

The emergence of an artificial intelligence capable of guiding the decisions of multinational's tax managers could lead to international restructuring, relocations and thus job losses and environmental consequences.

Therefore, such an increasing impact of a digitalized transfer pricing function within the society would imply increasing responsibilities for tax directors (1) and would require a minimum level of regulation through the integration of CSR criteria into the digitalized transfer pricing policies (2).

1. The increasing role of tax directors within the transfer pricing digitalization

For now, a significant part of the Big Four firms' activity is still focused on digital assistance for tax control with the French "FEC" (Fichier des Ecritures Comptables - Accounting Book File), a standardized extraction of the accounting consisting in providing the FTA with accounting in a standard format, that any company should in theory have no problem to perform but that is in reality still causing many issues to large companies, although their accounts are already digitized. In addition, there are in particular the CFCIs (Contrôle Fiscal des Comptabilités Informatisées – Tax Audit of the Digitized Accountings), where tax analysis on non-standardized data is to be carried out. As a result, procedural claims are increasingly focused on IT considerations: what kind of software do the FTA have the right to have access to, in which timing, what the FTA have the right to do with the data, do they have the right to exploit them, how, within which limits, and so on. But this shows to what extent, with the digitalization of tax audits, tax directors are or will become data scientists in order to be able to defend their companies with arguments based on both law and technology.

The above-mentioned "Tax Control Framework" EY tool makes it possible to collect exhaustive internal information, but it automatically leads to a situation of tax transparency and the administration has the right to have access to the reporting files because it has the right to access all information that contributes directly or indirectly to the formation of the results. This is currently a greater risk, but in the medium term the intrusion of the administration could become permanently legal and change the paradigm of tax audits like in the “relationship of trust” mentioned above: from a declaration-based tax system companies could be forced to adopt a principle of direct assessment by the FTA of the tax burden on the basis of the accounting and tax data received in their systems. It would certainly be possible to invoke a principle of non-interference in the management of companies defended in July 13, 2016 by the Council of State in the Monte Paschi Banque case (nº375801), but any principle is destined to receive exceptions and the fight against tax fraud is a very topical one. Tax directors would then be more than ever the guardian of the fundamental rights and freedoms in the interest of their multinational companies, and would ensure that the digitalization of the tax function is not being achieved at the expense of the rule of law.

Moreover, the amount of data that tax directors will have at their disposal in a few years will potentially transform their role into the company. From a function attached to the finance director, the tax director could be directly attached to the management committee, as the data it will be handling will be of a growing strategic importance. The amount of data will go well beyond the scope of its tax function and will bring its role into a completely different dimension involving the company's future by impacting the whole business model of the company. For example, as shown in previous examples, tax directors could be in a very strong position, supported by their artificial intelligence analysis on big data, to propose the accomplishment of external acquisitions, the creation of shared cost centers, or the need for cross-border restructuring operations. The emergence of tax directors armed with this new expertise in artificial intelligence will consequently have an increasing impact not only on the future of multinationals, but also on

society as a whole, which will mechanically involve regulations that could be anticipated by CSR compliant-by-design[42] artificial intelligence innovations.

2. The future CSR regulation of transfer pricing automation

The tax director of the future will not only be a data scientist, it will also be able to anticipate the challenges of social and environmental responsibility and to integrate them from the beginning into its transfer pricing policies, which will be automated by means of artificial intelligence. Henceforth, it is relevant to analyze what a software development process concretely means, with a typical process example from the EY Tax Technology and Transformation service: it involves writing specifications in which there is a general description of what the software will do, in order to then gradually build sublayers by detailing precisely what the software has to do, then other teams will develop the software and test it from a technical point of view, which then will return to the writer of the specifications to test it from a logical and tax point of view, then it is re-tested by pure tax specialists, and then it is finally tested by a beta-tester client. The inclusion of CSR criteria should therefore be made from the writing of the specifications in order to become effective. Likewise, building a tailored digitalized transfer pricing function first require the tax director to be a "beta-tester", contributing to the training of the personalized artificial intelligence system, judging its results' accuracy and guiding it towards self-reliance.

The emergence of an artificial intelligence designed for transfer pricing and compliant-by-design with legislation but also with soft law is not impossible given both the increasing inclusion of OECD guidelines in national legal frameworks and the numerous scandals that international tax planning raises in the public sphere. The principles of Corporate Social Responsibility are also of significant importance because of the OECD's involvement in the field, and above all because of the awareness that a failure to respect these principles of social responsibility, even in appearance (Carlos Ghosn case in France/Japan) or the

[42] Compliance by design is a process of developing a software system that implements a business process in such a way that its ability to meet specific compliance requirements is ascertained (IGI Global Definition).

respect of the environment (Vale case in Brazil[43]), can lead to economic (Enron case) or political (Odebrecht case in Latin America[44]) disasters.

Therefore, a subject as sensitive as transfer pricing policies could be digitalized by respecting CSR principles from the very beginning. The advantage of artificial intelligence is that, as mentioned above, it is able to analyze economic and social emotions and trends by assimilating data from the web, with a self-educating system. When the brand image is an important part of the multinational companies' business model, such an intelligent system could possibly influence transfer pricing policies according to consumer perceptions. In another scenario, companies whose activity is highly localized or localizable could, with artificial intelligence, improve their ability to detect early warnings of non-compliance with CSR principles by not only surveying internal reporting systems but also the company's reputation on the web and the risk profiles of third parties. In addition, the advantages of such an implementation of CSR criteria, varying according to the jurisdictions and existing codes of conduct (such as that of Afep-Medef[45]), would be, in transfer pricing, to contribute to the improvement of the listed companies' corporate governance.

Tax authorities would however be deprived of their traditional tax reassessment tools against an artificial intelligence that would define the digitalized transfer pricing policy with a compliant-by-design technology potentially approved in advance by a ruling from the tax authorities, as part of a "Relationship of Trust" transformed into a software approval. But this would be without considering the State's imagination to raise new public funds: in the latter case, where a reassessment on objective digitalized criteria would be made impossible, it is possible to imagine – after the increasingly personalization of taxation above-

[43] Vale SA is the world's largest iron ore producer and one of Brazil's national champions, but a failure in the risk reporting process caused in January 2019 the death of 200 people among one of the world's worst mining disasters (Source: Financial Times).

[44] Odebrecht SA is the Brazilian construction group at the centre of Latin America's largest corruption scandalfraud - the biggest foreign bribery case ever, according to the US Department of Justice (Source: Financial Times).

[45] Since 1995, AFEP (French association of large companies) and MEDEF (National confederation of French Employers) have been developing governance standards, which enable listed companies to improve their operating and management practices in a transparent manner to meet the expectations of investors and the public (Source: AFEP).

mentioned – a move towards a subjectivization of tax litigation around the human arbitrations made on the basis of the analytics and proposals of the approved artificial intelligence. In this perspective, new criminal and financial sanctions, aimed at ensuring that at least one individual remains responsible for the control of this digitalized international tax planning process, would be difficult to avoid and would correspond to the increasing individualization and criminalization that society is experiencing in the XXI century.

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