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Effect of Anti-Tax Avoidance Laws on the Location of Patent Ownership and Research and Development Activities in Multinational Corporations

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A research report submitted to the Faculty of Commerce, Law, and Management in fulfilment of the requirements for the degree of Master of Commerce in the field of Taxation

Effect of Anti-Tax Avoidance Laws on the Location of Patent Ownership and Research and Development Activities in Multinational Corporations

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Abstract

Multinational corporations (MNCs) are always under scrutiny for engaging in activities that tax authorities allege are solely intended to lower the tax burden of these organizations. Consequently, governments are always formulating new laws, rules, and regulations that target tax avoidance activities of MNCs, limiting approaches and legal loopholes that may be used to lower the corporations' tax burden. This study investigates how anti-avoidance laws influence the location of patent ownership and research and development (R&D) activities of MNCs. It is a study that takes a closer look at the murky waters that characterize the international taxation system to see how global players navigate taxation measures for their own benefit.

The study visits tax destinations like South Africa, Ireland, and the US to highlight the characteristics of tax systems and to throw light on the situation on the ground.

Ultimately, growing evidence from resource studies and the news media indicates that MNCs have resorted to shifting profits from high- to low-tax jurisdictions with the aim of lowering their overall corporate tax obligation.

It is an explosive study that reflects the interesting web of activities that persist behind the international tax regulations. People have forged careers out of maneuvering tax jurisdictions to save millions of dollars for MNCs.

Key Words: Patents, Research & Development, Income-Shifting, Tax, Tax Law, Base Erosion and Profit Shifting, BEPS, Multinational Corporations, MNC, Controlled Foreign Company, CFC, General Anti-Avoidance Rule, GAARR, Intellectual Property, IP.

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List of Abbreviations

ATAD - Anti Avoidance Directive

BEPS - Base Erosion and Profit Shifting

CCCTB - Common Consolidated Corporate Tax Base

CDO – Collateral Debt Obligation

CFC - Controlled Foreign Companies

CEN – Capital Export Neutrality

CIN – Capital Import Neutrality

DAC 6 – Directive of Administrative Cooperation 6

EEA – European Economic Area

FTC – Foreign Tax Credit

GAARR – General Anti Avoidance Rules

HC – Headquarter Company

IP- Intellectual Property

MNC – Multi-National Corporation

OECD - Organization for Economic Co-operation and Development

PE – Permanent Establishment

QBAI – Qualified Business Asset Investment

REIT – Real Estate Investment Trust

R&D – Research and Development

SAARs - Specific Anti-Avoidance Rules

TCA – Taxes Consolidation Act

VCC – Venture Capital Company

WHTC - Western Hemisphere Trade Corporation

1. Introduction

International trade may vary in its form, product, or service, but this type of trade is inspired by multinational organizations' (MNC's) desire to tap into a wide market and to grow their revenue and profit.[1] While operating on the international stage, MNCs have to grapple with the complex environment of variable corporate income tax regimes. Different countries have varying approaches to corporate income tax, but one thing remains comparable across these economies, whereby Hebous (2020) contends that in all economies of the world, corporations are perceived as taxpayers irrespective of their owners. In some instances, the tax payable is so high that it is perceived to be untenable by many MNCs. For instance, Hebous (2020) gives the example of the United States in 1968, when the corporate tax rate reached 52.8% to enable the federal government to finance the war in Vietnam. Conventionally, in developed and developing countries, this rate averages between 22.3% and 24% (Hebous 2020, p. 4). Hence, tax regimes are not fixed rates. Conversely, these rates usually vary based on different economic needs and priorities of a given jurisdiction. Overall, while the prospects of internationalization may be attractive to MNCs because of the inherent advantages of the strategy, including economies of scale and specialization, the approach is under the constant threat of high taxation.

Considering the threat above, MNCs have sought to find a way around high taxes. Intellectual property (IP) has transformed into a leading tax avoidance vehicle for many MNCs. In an article in *The New York Times*, Duhigg and Kocieniewski (2012) detailed how Apple managed to outmaneuver high taxation through deliberate but legal strategies. As it was reported in the article, Apple

[1] Hebous (2020) reports that 'thinking of international trade—whether the crawling caravans on the Silk Road or the giant vessels of the 21st century—we tend to picture goods and containers or merchants seeking to exploit comparative advantages, regional differences in endowments, economies of scale, and benefits from agglomeration and specialization (p.4).'

was the MNC that pioneered the technique of designating its sales people from abroad in high-tax jurisdictions in a way that allowed these individuals to sell on behalf of low tax subsidiaries located elsewhere (Duhigg and Kocieniewski 2012). Another approach by the tech giant is what Hebous (2020) described as avoidance of tax by violating the arm's length principle. Under this principle, intergroup prices are usually valued at the price that an organization charge other businesses. Therefore, in practice, an MNC may implement the strategy by overpricing products that it imports from its affiliates in jurisdictions with low taxes. The consequence of such a strategy is inflated costs in countries with high tax regimes. Alternatively, an MNC may also opt to underprice its exports to its affiliates, which understates the organization's income in jurisdictions with high taxes (Hebous 2020). With this strategy, the lower cost of exports reduces the tax burden of the subsidiary, yet the affiliate charges a higher price for the goods to increase its sales revenue and profit. Still on the case of Apple, Duhigg and Kocieniewski (2012) report that the technology giant invented a technique dubbed the 'Double Irish With a Dutch Sandwich.' This strategy reduced the overall tax burden of the company by ensuring that profits were moved to countries that charged low tax or those without tax at all. Countries with low tax included Bermuda and the UAE (United Arab Emirates). Through this strategy, the organization was able to reduce taxes by rerouting profits through the tech giant's Irish subsidiaries, the Netherlands, and the Caribbean. In 2012, for instance, the reporters note that Apple's tax bill in the United States would have been higher by $2.4 billion. The US-based MNC is reported to have paid $3.3 billion in taxes around the world after reporting $34.2 billion in profits (Duhigg and Kocieniewski 2012).[2] This amount means that Apple tax burden represented 9.8% of the company's reported profit, which is way below the

[2] Duhigg and Kocieniewski (2012) report that 'by comparison, Wal-Mart … paid worldwide cash taxes of $5.9 billion on its booked profits of 24.4 billion, a tax rate of 24 percent, which is about average for non-tech companies'

average rate of between 22.3% and 24% reported earlier. Hence, one can surmise that MNCs such as Apple have innovative avoidance strategies that reduce their tax burden significantly.

1.1.Research Problem

The international scope of MNCs enables these organizations to enjoy the merits of comparative advantages, economies of scale, regional differences, and the inherent advantages of specialization and agglomeration; however, this basic feature of these organizations also generates an inherent threat due to the multiplicity of jurisdictions. Multiple jurisdictions imply that these corporations have to walk a thin line characterized by an environment of differentiated legal structures. While the opportunity of a low tax regime in one jurisdiction presents the corporations with a chance to maximize returns through transfer prices concerning patents, the approach of various jurisdictions to patent laws and general anti-avoidance rules requires a close examination of provisions and precedent established in case law. Hence, the question that remains concerns how anti-avoidance affects the location of patent ownership and research and development (R&D) activities in multi-national corporations.

1.2. Main Question

This study focuses on three variables; these are anti avoidance laws and location of patent ownership and R&D activities. The primary question of this study states as follows: In what ways does anti avoidance laws affect the location of patent ownership and research and development activities in multinational corporations.

1.2.1. Sub-Questions

To answer the question above, the study will be guided by the following sub-questions:

1. How does anti avoidance of high tax regimes affect profitability of MNCs?
2. How does anti avoidance of tax havens affect profitability of MNCs?
3. What are the tax avoidance strategies employed by MNCs?
4. How does the location of a patent affect the bottom line of an MNC?
5. How does the location of R&D affect the bottom line of an MNC?

1.3.Research Methodology

This study employed the qualitative research approach that combined qualitative analysis of secondary data and case studies. The study collected secondary literature, including journal articles, working papers, and collective volume publications. The authors of these secondary data were either independent researchers or experts affiliated to leading global institutions or bodies such as the OECD and the EU. Particularly, the research process involved extensive review of published literature, on key selected themes, including anti-avoidance, taxation, and patent and R&D laws. The review analyzes specific anti-avoidance techniques that MNCs employ to outmaneuver legal statutes that are specifically established to ensure that these organizations fulfill their tax obligations. The review also explores three tax regimes, including the United States, South Africa, and Ireland, with the aim of revealing the specific provisions of these regimes' laws that either foster avoidance or attempt to prevent the practice. The aim of the review is to provide carefully thought insights into areas of weakness, which are reflected from the loopholes that MNCs exploit. Such insight can form a sound backdrop against which government tax officials can implement reforms that not only prevent avoidance but also foster healthy competition. The following sections present

a brief description of the research design, the search strategy employed in collecting articles for qualitative review, the data analysis method used in the study, and the exclusion and inclusion criteria.

1.3.1. Research Design

As has been established, the qualitative research design was the selected research method in the current study. A research design generally refers to a comprehensive plan that an investigator employs for data collection. This design is described as a blueprint that one uses to answer specific research questions or to test specific hypothesis. A research design provides a model for data collection, instrument development, and sampling (Bhattacherjee 2012). However, since the current study was qualitative in nature, the researcher neither developed research instruments nor determined a sampling process. Such is the case since the study did not involve manipulation of original data; by contrast, the study relied on analyzing evidence from existing literature on the research topic concerning the influence of anti-avoidance laws on the location of patent ownership together with research and development activities of multinational firms.

1.3.2. Search Strategy

The search was conducted on six databases including Google Scholar, EBSCO, ProQuest, Dialog, SSRN, and Econlit. On the Google Scholar database, the search activity utilized the terms ((anti avoidance laws) AND (patent location)) OR (Research and development location). Similar terms were used to generate articles from SSRN, EBSCO, ProQuest, and Dialog databases. However, the Econlit database is designed differently; hence, the search strategy had to be refined to meet the unique structure of this database. The records in the database are stored under different clusters,

including author, publication, author affiliation, document type, and subject classifications, among other fields. For journal articles and other documents in the database, the author field was straightforward. With author affiliation, on the other hand, this database has this field for journal articles, working papers, and collective volume publications. For this study, the process employed the term 'Econ' to limit the search to publications from authors affiliated to the field of economics. With Econlit, the source of the document is also determined by the type of document. Hence, while the source of a journal article is the journal, conversely, with collective volume articles, the source is the collective volume in which the article appears. In this study, the search was limited to the following document types: journal articles, collective volume articles, and working papers. The specific topic under which the search was limited was 'law and economics,' which the Econlit database codes as KOO general. However, law and economics is further subdivided into various topics, including basic areas of law (K1), regulation and business law (K2), other substantive areas (K3), and legal procedure, the legal system, and illegal behavior (K4). The search was restricted to K3, other substantive areas, with specific emphasis on tax law (K34).

1.3.3. Data Analysis

This study employed qualitative analysis. Researchers who work with qualitative data from texts or data collected from interviews usually prefer this approach. More important, unlike is the case with quantitative data, which tends to be predominantly driven by statistics and largely independent of the researcher, qualitative analysis is heavily reliant on the researcher. Particularly, the investigator is called upon to invoke their analytical and integrative skills in addition to their personal knowledge of the social context from which the data is derived (Bhattacherjee 2012). Hence, the focus of this study was to make sense of the current MNC practices related to patent location based

on these organizations' strategies, which were heavily determined by corporation tax laws. This focus of the qualitative study differentiates the process from quantitative data analysis, in which researchers focus on predictions and explanations. Due to this nature of qualitative data analysis, the investigator had to have a creative mindset, which was further enhanced by ethically enlightened and participant-in-context attitude as Bhattacherjee (2012) observes. My vast experience and knowledge in taxation and corporate behavior had to come into play.

In the analysis of vast sets of data generated primarily from secondary data sources, including journal articles, working papers, and collective volume articles, various techniques are available for researchers. However, for the case of the current study, the preferred technique was grounded theory. This technique, according to Bhattacherjee (2012), is an inductive approach to the interpretation of recorded data, and the goal of the researcher during the exercise is to develop theories about the phenomenon. Previously, researchers have established that from a theoretical perspective, the shifting of income from a strategic patent location is the right move for MNCs because of several reasons. Firstly, these companies generate above average returns from R&D activities, with the majority of patents that the firms hold associated with high industrial values (Baumann et al. 2018). Consequently, MNCs have all the reasons to legally locate patents in jurisdictions with low taxes to reduce the firms' tax burden, with specific emphasis on patents that have high-expected earnings.[3] At the same time, unlike other assets, which are associated with high trade costs, if organizations were to consider relocating them, patents are known to generate zero trade costs, meaning that separation of these intangible assets from their operating affiliates, which are usually

[3] The findings in Baumann et al.'s study supported 'the G20/OECD's BEPS-notion that MNEs' innovative output is often geographically separated from the inventor location for income shifting purposes and the related BEPS-focus on the design of anti-profit shifting measures that hinder this separation (e.g., by strengthening the role of conduct relative to contractual relations in determining the allocation of income across group affiliates)' (p.3).

located in high tax countries, comes virtually at no cost.(Baumann et al. 2018, p. 4) Thirdly, given that MNCs are compelled to pay royalties to the patent owner, which usually is a CFC in a low-tax economy, legal location of these intangible assets at a low-tax affiliate creates room for additional profit shifting opportunities.(Baumann et al. 2018, p. 4) The focus of this study was to interpret existing evidence that supports some of the assumptions listed above regarding MNCs patent location practices; hence, either confirm or reject existing related theories. Grounded theory, the data analysis approach used in the study, was formulated towards the end of the sixties. Glaser and Strauss developed this model in 1967, but Strauss and Corbin refined the framework later in 1990 (Bhattacherjee 2012, p. 113). The underlying concept behind the model is to ground or base interpretations on observed empirical data. To ensure that the researchers' interpretations are solely based on observed data, the investigator has to suspend any existing theoretical expectations or knowledge about the subject, meaning that all assumptions about the topic have to be based on the observed data alone.

The data analysis process will employ open data coding in the investigation. Open data coding and other related techniques, including selective coding and axial coding, is a renowned qualitative analysis approach. With open data coding, the selected approach in the current study, the researcher identified concepts or key ideas that are hidden within published articles about the research topic. More important, with open coding, the process involves examination of raw textual data line by line with the goal of identifying discrete incidents, events, perceptions, or actions, among other happenings of relevance, which the investigator proceeds to code as concepts. Each given concept is connected to specific portions of an article, and the researcher refers to this text during later stages of analysis. While some concepts tend to be clear and simple, at given times,

some authors tend to be cryptic in their writing, meaning that a reader has to interpret the text to unravel the relevant elements.

1.3.4. Inclusion and Exclusion Criteria

The qualitative analysis of secondary data part of the study had a strict inclusion and exclusion criteria. Particularly, only articles published within five years were included in the analysis. Hence, the study included published literature between 2016 and 2022. Moreover, while regulation and business law are an expansive field, which includes anti-trust law, business and securities law, cyber law, real-estate law, regulated industries and administrative law, labor law, property law, and contract law, among others, the study limited the analysis to articles that only integrated aspects of tax law in their research.

1.4. Research Outline

The introductory chapter presents the research problem and the study's main question. This first part also describes the studies preferred methodology. The second chapter delves deep into key areas of focus in MNCs' corporate taxation. Afterwards, the analysis describes three case studies with specific emphasis on the countries' tax regimes. These countries include the United States, the Republic of South Africa, and the Republic of Ireland. The fourth chapter explores patent shifting practices with the aim of linking literature to theory. The results of the qualitative analysis are presented in the fifth chapter while the sixth chapter synthesizes key findings from the qualitative analysis of the secondary data. The last chapter puts the findings of both the case studies and qualitative analysis of secondary data into perspective and presents the conclusion.

1.5. Conclusion

The report presents a proposal for an upcoming study that reflects on how anti avoidance laws affect the location of patents and R&D activities in MNCs. The study's guiding primary question is as follows: In what ways does anti avoidance laws affect the location of patent ownership and research and development activities in multinational corporations? The proposed research method is a qualitative research approach. The case studies introduce an overview of the international tax architecture, including the two alternatives, the worldwide system, and the territorial system, before proceeding to discuss three specific case examples of tax regimes, including South Africa, Ireland, and the United States. In conclusion, there is an exploration of emergent themes on the topic of patent and R&D relocation practices of MNCs. The third chapter presents the methodology while the fourth chapter has the findings. The last part is the conclusion of the research.

2. MNCs Corporate Taxation: Key Areas of Focus

MNCs play a critical role in the global, regional, ad national economies. These organizations, as reported earlier seek to take advantage of the benefits of a global market, including economies of scale and comparative advantage, among others. This chapter introduces the key concepts under review, including patents, tax avoidance, anti-avoidance, transfer pricing, and tax planning.

2.1. Patents: Key characteristics and Suitability for Tax Avoidance

Patents generate various features that make them ideal for reducing an organization's tax burden. Two features of these assets stand out. First, patents are not physical assets, meaning, unlike factories, employees, and other related physical assets, patents can be relocated to a tax haven easily through paper work (Hebous 2020).[4] From this understanding, one gathers that patents comprise registered trademarks that prevent competitors from using a specific invention. Patents are considered as part of trade transactions involving commodities or services in which they are integrated because expenditure on innovations and creativity is a tax deductible as it is an investment. Secondly, since every patent protects unique knowledge, it is not possible to generate a precise fair market value of these assets (Hebous 2020). MNCs take advantage of these features of the IPs by lowering the valuation of patents, which results in very low taxes. Overall, IP-based tax avoidance schemes involve low artificial processes to a patent.

[4] *See also* Blair-Stanek (2015 p.5)

2.2. Why are Patents Difficult to Value?

To understand the economics that surround patents, it is critical to analyze the various specificities that make IP rights unique. The fact that patents are unique may be important for some transactions but not for others (the next section on whether transfer pricing can invalidate patents describes different scenarios that demerit tax avoidance through transfer pricing). The value of a patent depends on the extent to which an MNC can secure its legal protection, allowing the corporation to accrue the highest return from the patent without grappling with the threat of substitute products or services by a rival who violates the company's right to the patent because of a legal loophole. The international nature of an MNC's market further complicates the scenario, since more than one jurisdiction is involved in transfer pricing cases. More important, these jurisdictions' approaches to intellectual property rights may vary. It is also possible that the countries in question provide legal protection to the patents of different parties or have varying degrees of protection for IP rights. Similarly, the level and duration of protection influence the value of a patent, meaning it also affects other related assets that are linked to the right.

The contribution of patents to the value of an MNC is immense. This value is generated through continuous interaction of the patent with other assets of the company. The question that remains relates to whether it is possible to separate intangible patents from other assets of an MNC for taxation purposes. Researchers argue that various approaches have been formulated to achieve this objective, but the resulting valuation of the patent varies from one strategy to another. An attempt by an MNC to separate an intangible asset from the physical assets of a company may be easy to achieve in some cases, but it might be difficult in others. For instance, a computer manufacturer

who sells PCs together with embedded software may easily separate the equipment from the software if the latter is sold in the market separately. The same attempt might not be possible with specialized medical equipment that uses specialized software. Such is the case since the medical equipment has very little value without the specialized software. Overall, while some patents may be separated easily from a company's physical assets, others may not be easy to delink from an MNC.

Another feature of patents regards their ability to interact with financial assets to generate value. For instance, a given software can only work when it is embedded in a certain machine. More important, the machine cannot provide a user with the required service without the software. Similarly, the software on its own cannot generate utility for a user. More important, the software and the original equipment have to be integrated to generate value, meaning that patents to the software interact with physical assets to create value. The question that remains relates to whether it is possible to compute a price of standalone patents on software without linking them to physical equipment.

2.3. Can Tax Avoidance Through Transfer Pricing Invalidate Patents?

The case of Apple presented earlier, in which the tech giant is known for selling its California-invented IP rights to its subsidiaries in Ireland to avoid tax, illustrates the phenomenon of transfer pricing. Transfer prices refer to prices that an MNC is legally obligated to report concerning its transactions with other parties such as its subsidiaries (Brauner 2008). Some legal scholars have argued that lowering the price of IPs is a precarious tax avoidance strategy (Brauner 2008). In other words, the nature or structure of the tax avoidance approach through relocated patents opens

itself to legal loopholes that can be exploited in court cases. Blair-Stanek discussed various scenarios through which a party can defend itself against an action brought before a court by an MNC concerning patent violation.

The first argument that a defendant may present, which Blair-Stanek described, invalidates a patent infringement lawsuit based on the "obvious" claim.[5] According to the author, for a patent to be valid, the applicant must ascertain that the invention was not obvious to scientists or engineers in the relevant field (Blair-Stanek 2015). Since IPs comprise technical and highly specialized knowledge, patent law in many jurisdictions has sought to simplify the approach that jurors and judges may use in determining the obviousness claim. The approach in case law involves secondary considerations, which are a better alternative, since they are non-technical. For this matter, jurors and judges may consider cases based in the licensing or commercial success of a patent. The problem is that since MNCs undervalue their patents in tax havens, a defendant in a violation lawsuit may argue that an applicant did not see the innovation as substantial. Similarly, since MNCs rely on appraisers to lower the price of the patent, a defendant can use such documentation as damaging admissions that degrade the innovativeness of a patent (Blair-Stanek 2015). Overall, lowering the value of patents during transfer pricing has the potential to degrade the innovativeness of the IP.

The second argument that may invalidate a patent is the scope of the patent. Primarily, for an applicant to ascertain infringement, they must provide proof of its broad scope. According to Blair-

[5] Blair-Stanek (2013, p. 1172) explain that Tort law has two approaches to repairing of injurious claims by parties. The first of these approaches involves the liability rule, which requires a defendant to pay compensatory damages to a claimant but allows the defendant to continue with the activities that resulted in the plaintiff's claim. With a property rule, conversely, a much harsher penalty is imposed on the defendant.

Stanek, courts are known to give a broad definition based on their innovativeness (Blair-Stanek 2015). Such broad scopes make it easier to ascertain infringement because it is simple to find out how the perceived application of a given technology for instance borrows directly from the patented idea of an applicant. By contrast, patents that are less innovative usually receive a narrow scope. For this matter, a defendant in a case of patent infringement may argue that an applicant, by undervaluing a patent, did not perceive the patent to be innovative enough. For this matter, such a patent should receive a narrower scope. This fluid situation makes it difficult for the applicant to prove infringement on their organization's intellectual property rights to a given innovative idea or technology. At the same time, as is the case under the obviousness claim, the defendant may use the appraiser's documentation as damaging evidence that degrades the inventiveness of the purported IP rights.

The third argument concerns the pricing of the patent. A defendant may argue that despite a court finding a patent valid, meaning that an applicant's IP rights have been infringed, the low price of the patent suggests that any damages owed to the applicant should be correspondingly low (Hebous 2020). In other words, the defendant's rationale is that how an MNC values its patent is a reflection of the IP right's potential to generate profits or royalties. For this matter, the patent damages that the applicant may be seeking should be the equivalent of forgone profits and royalties.

In many legal actions, an MNC may seek a preliminary injunction against a defendant's infringement, hoping that if its legal action against a defendant were successful, the organization would ask the court to grant a permanent injunction. The problem is that the undervaluation of a patent makes it particularly hard for the organization to argue a strong case, with specific respect to the evidence the firm needs to present before a court to obtain relief (Blair-Stanek 2015). In common

practice, a judge in a preliminary hearing would require an applicant to demonstrate that if the defendant were to be allowed to operate and economically gain from the patent, the organization would incur irreparable harm, which could not be compensated in monetary terms. The problem is that tax avoidance through transfer pricing results in putting a value to the transferred patent. More important, an MNC would have a hard time convincing a court that the damage that it would suffer were the court to refuse to grant a preliminary injunction could not be ascertained in monetary terms. Overall, an applicant may argue that a low transfer price for tax avoidance purposes is proof that the damages are reparable monetarily.

The last argument that renders tax avoidance through transfer pricing of patents precarious concerns public policy. According to Blair-Stanek, a defendant may argue that the manner in which an MNC has deployed given IP rights amounts to patent misuse (Blair-Stanek 2015).[6] The court, for this matter, would be compelled to decline to award an applicant injunctive relief or damages resulting from the misuse of its IP rights until the MNCs remedies the perceived misuse. In other words, the defendant would argue that the undervaluation of the patent denied the government significant revenue from taxation; hence, the conduct of the applicant was contrary to public policy. However, the court would have to find an MNC's tax avoidance strategy to be sufficiently egregious (Blair-Stanek 2015). Overall, lowly priced patents for tax avoidance purposes give a defendant's room to arm themselves with various extensions of patent law, including narrow scope, invalidity, misuse, and no-injunctions as the basis for their defense against an infringement lawsuit by an MNC. Consequently, the MNCs are more empowered by the legal systems than the governments in the affected states.

[6] According to Blair-Stanek (2015), 'misuse does not require that the patent holder harmed the defendant, only that the patent holder used the IP in a way that violated public policy' (p.7).

2.4. General Anti-Avoidance: Taxpayers vs Governments

Many countries have introduced general anti-avoidance regulations (GAARs) in a bid to curb tax avoidance in their respective jurisdictions.[7] In a broad sense, tax avoidance is prima facie legal, but the practice results in egregious tax benefits. GAARs are taxation laws like any other laws. However, these laws, according to Atkinson (2012), extend the reach of conventional legislation, meaning they cover arrangements that would not be caught by mere procedural or administrative provisions (Atkinson 2012). GAARs are described as follows: 'general expression of principle, directed at restoring liability to taxation to that which would have resulted from the operation of the ordinary provisions of the taxation law had they operated as intended' (Atkinson 2012, p. 3). More important, based on this description, GAARs differ from other comparable charging principles in two primary ways. The first feature of these laws is that they do not target a specific taxpayer; contrastingly, GAARs operate generally. The second feature of these laws is that they specifically target parties that seek to avoid their taxation liability. Thus, it is important to consider what constitutes tax avoidance in brief.

2.5. Tax Avoidance

Tax avoidance is an issue of concern in economies as it has negative implications on governments. As established earlier, governments rely on taxation to finance state activities and agencies. According to Latham CJ, taxation is 'compulsory exaction of money by a public authority for public purposes, enforceable by law, which is not payment for services rendered' (Tooma 2008, p. 12).

[7] Germany: Abgabenordnung [General Tax Code] (Germany) § 42; Australia: Income Tax Assessment Act 1936 (Cth) pt IVA (ITAA 1936 (Cth)); Ireland: Taxes Consolidation Act 1997 (Ireland) s 811 Canada: Income Tax Act, RSC 1985 c 1 s 245 (ITA 1985 (Canada)); South Africa: Income Tax Act 1962 (South Africa) ss 80A-80T.

Conversely, tax avoidance 'involves the legal exploitation of tax laws to one's own advantage'(Tooma 2008, p. 12). Conventionally, many legal systems tend to shy away from defining tax avoidance. It is also important to point out that in jurisdictions that are based on specific anti-avoidance (SAAs) statutes, the law tends to detail the types of conducts that are disallowed. This is not the case in countries that follow the GAARs model, as this legal model is intended to be sufficiently broad to allow the legal framework to capture avoidance schemes that the drafter may not have contemplated at the time the provisions were drawn. Since tax avoidance lacks a universal definition, several jurisdictions have sought to develop their own understanding of the concept. In the UK for instance, the Royal Commission on Taxation of Profits and Income (the Radcliffe Commission), differentiated between tax evasion and avoidance, noting that the latter was 'some act by which a person so arranges his affairs that he is liable to pay less tax than he would have paid but for the arrangement. Thus, the situation which he brings about is one in which he is legally right '(Tooma 2008, p. 13). Conversely, in Canada, the Royal Commission on Taxation, Canada (the Carter Commission) described avoidance as follows:

> … every attempt by legal means to prevent or reduce tax liability which would otherwise be incurred, by taking advantage of some provision or lack of provision in the law… it presupposes the existence of alternatives, one of which would result in less tax than the other. (Tooma 2008, p. 13)

The Canadian description indicates that companies tax advantage of lax tax systems to reduce taxes. This implies taking advantage of loopholes in the tax systems. The Carter Commission's conceptualization of the concept of tax avoidance did not vary from the earlier version by the UK commission. However, the Carter Commission sought to draw the difference between tax avoidance approaches that were conventional from those that the commission believed should be targeted by the law. More important, the distinction between these two strategies was mainly on the

basis of the motive behind the approach. For this matter, the Carter Commission emphasized that parties that adopted a tax avoidance scheme for purposes of paying less tax should be differentiated from a party that adopts the same scheme for business or personal reasons. Overall, in the Canadian definition of tax avoidance, the taxpayer's motivation was to be assumed from the specific context of the taxpayer, the tax authority, and the character of corresponding transactions.

Elsewhere, Australia also sought to define the concept. Particularly, the Taxation Review Committee, Australia (Asprey Committee), opted to adopt the two definitions by the Radcliffe Commission and the Carter Commission (Tooma 2008).[8] Thus, concerning tax avoidance in Australia, the Asprey Committee stipulated that a fine line should 'be drawn between the transaction that offends and the one which merits no condemnation' (Tooma 2008, p. 13). However, the terms set in the Australian version resemble the conditions defined by the Carter Commission. For this matter, 'legitimate tax avoidance in Australia occurs where taxpayers deal at arm's-length under the normal means of carrying out a transaction' (Tooma 2008, p. 12). The 'arms-length' principle is based on the assumption that fairness is applied in order to ensure that transparency is applied in taxation based on market factors. The arms-length principle is discussed next.

2.6. The Arm's Length Standard

In international legal practice, MNC's transfer pricing is solely based on the arm's length standard. The 'arms-length' principle is based on the assumption that fairness is applied in order to ensure

[8] However Mclaren (2008) reports that "for some time the Australian Government has ignored the difference between [tax evasion and tax avoidance] when it comes to Australians using tax havens and being investigated as part of 'Project Wickenby'. For example, the law to deter the promotion of tax schemes, Division 290, of the Taxation Administration Act 1953 (Cth) ignores the distinction between tax avoidance and tax evasion and deals with 'tax exploitation schemes' instead" (p.141).

that transparency is applied in taxation based on market factors. The overarching idea behind this standard stipulates that when parties that are related are involved in a transaction, the resulting actions should proceed as if the two were not related; hence, the transactions should be subject to market pricing (Brauner 2008). In the United States, the earliest attempt to curb tax avoidance through transfer pricing was Regulation 41, Articles 7 and 78 of the 1917 War Revenue Act (Anon. 1917). This Act gave the Tax Commissioner the authority to compel corporations to file their tax returns whenever necessary, which would allow relevant tax authorities to determine the corporations' taxable income or invested capital more equitably (Avi-Yonah 2007). However, the earliest direct predecessor of the current code was a directive by Congress to the Commissioner, requiring the latter to consolidate accounts of all affiliated corporations in a way that would result in an accurate distribution of profits, capital gains, deductions, or income between or among related businesses (Avi-Yonah 2007). Congress was of the view that previous laws gave MNCs significant room to maneuver, and they were increasingly permissive to these organizations' tax avoidance techniques through affiliates. Overall, the problem of MNC's use of affiliates for tax avoidance significantly featured into the directive by Congress that led to the enactment of the earliest predecessor of *Section 482 of the Internal Revenue Code* (the Code).

Shortly before the Great Depression, the provision was adjusted and edited from the consolidated return provisions. Consequently, it was expanded to describe a more robust Section 45 of Income and Deductions. In the new law, two or more businesses operating in the United States, which were either affiliated or not affiliated and which were controlled by the same interests were expected to distribute, apportion, or allocate their earnings or deductions across the business. More

important, this approach was critical to prevent these organizations and their affiliates from avoiding taxes and to compel them to publish the true incomes of their businesses (Avi-Yonah 2007). The language in the earlier legislation, according to Avi-Yonah, is similar to the one used in Section 482 of the Code before Congress passed the 1986 US Tax Reform Act to amend it. Apart from compelling MNCs to publish earnings that reflected their true tax liability, the code was also intended to prevent tax evasion.(Avi-Yonah 2007, p. 5) In applying the code to case law, US courts did not expressly invoke the arm's length principle. Contrastingly, the idea was to ensure a fair treatment of business entities while protecting government at the same time.

The first attempt to employ the notion of arm's length was in 1935. A good example in case law of such earlier application is *Seminole Flavor Co. v. Commissioner*. The issue in this case concerned whether transactions between a company and a partnership that the company struck for the purpose of marketing the organization's products could be adjusted to shift income from a partner to the company (Anon. 1945). The Court decided in favor of the taxpayer, noting that the arm's length nature of the transaction was determined on the basis of whether it was fair and reasonable, meaning that the question raised by the Commissioner regarding if unrelated parties could enter the transaction was irrelevant (Anon. 1945). The rulings in similar cases during the period show that courts ignored the issue of existence of comparability; instead, courts focused on analyzing various standards (Avi-Yonah 2007). Nevertheless, some cases also illustrate that courts' rulings in the United States were inconsistent. For instance, in *Hall v. Commissioner*, the Tax Court sought to decide the case using a comparable to determine an arm's length price (Anon. 1942). The case involved sales by a U.S. MNC to an affiliate in Venezuela at a cost that was inflated by 10%. The resulting price amounted to a discount of over 90% from the listed price charged by unrelated

distributors of the same product, who only received a 20% discount (Anon. 1942). In the court's rulings, the taxpayer was found to have shifted gross income to the Venezuelan affiliate (Anon. 1942). More important, earlier cases indicated lack of a standard practice. The question of whether courts should always apply the arm's length principle arose in *Frank v International Canadian Corporation*. This case involved the sale of chemicals by a US-based MNC to an affiliate, the Western Hemisphere Trade Corporation (WHTC) (Anon. 1962). In their defense against the Commissioner's allegation of violation of tax law, the parties argued that the transaction reflected both reasonable price and profit between the companies. The lower district court had ruled that the Commissioner had stipulated himself out of court on the issue concerning Section 4. However, the Commissioner appealed this decision in the United States Court of Appeals for the Ninth Circuit, noting that the lower court had based its ruling on the reasonable return standard as opposed to the more appropriate arm's-length standard.

Still, the ruling of the appellate court was in favor of the defendants. Particularly, the court noted that the commissioner's contention that an arm's length bargaining should be the only criterion for applying the provisions of Section 45 concerning determination of the actual net income only applied to controlled tax payers.[9] However, in established precedence, the majority of cases concerning Section 45 were decided without reference to the principle of arm's-length bargaining and the regulations of the Treasury Department, which stated that the concept of arm's-length should be the applicable standard in all cases (Anon. 1962). Overall, the decision of the appellate court in *Frank v International Canadian Corporation* principally invalidated the regulations of Section 45

[9] According to Avi-Yonah (2007) 'the purpose of Section 45 is to place a controlled taxpayer on a tax parity with an uncontrolled taxpayer, by determining, according to the standard of an uncontrolled taxpayer, the true net income from the property and business of a controlled taxpayer' (p.5).

and the Treasury Department's regulations and rulings. These regulations required uncontrolled taxpayers to establish what unrelated parties would have done to reflect the actual income clearly, living the commissioner responsible for the correction of the tax liability of corporations in suspected cases of tax evasion.

2.7. Tax Planning

Closely related to the concept of tax avoidance is the notion of tax planning. Experts distinguish between two tax planning models, including tax planning in the narrow sense and tax minimization (Schanz and Schanz 2010). With tax planning, corporations usually seek to integrate taxes into decision making; hence, it allows them to select the right alternative from a list of available options or investment opportunities. This approach to tax planning is considered as part of the pre-investment analysis. More important, MNCs model the decision set explicitly, before selecting the best opportunity based on a certain criterion (Schanz and Schanz 2010, p. 6). With tax planning, organizations have to adhere to a tax planning process.

The process begins with identification of a decision maker. This process ideally involves selecting the party to be in charge of decision-making. This is important because organizations in themselves cannot make decisions, meaning certain individuals must be assigned this responsibility. These individuals might include members of the management team or the shareholders. Larger firms, unlike smaller organizations, have to find an optimal location and legal form when making decisions concerning tax planning. The second step involves identification of the objective. This step is critical since it is assumed that each individual focuses on maximization of consumption utility. To achieve this end, organizations must design a strategy or business approach that maximizes the

wealth of shareholders. During the third stage, organizations identify the appropriate decision model before proceeding to the fourth phase that involves either tax planning or tax minimization.(Schanz and Schanz 2010, p. 9) More important, if the organization is yet to make the investment or financing decision, an MNC treats the problem as a tax planning issue.(Schanz and Schanz 2010, p. 9) In this case, the company analyzes information concerning its cash flows, interest rates, an investment's time horizon, and tax information. If the MNC has already made the decision to invest, meaning the project's implementation is already in play, focus should be on minimization of tax. More important, tax avoidance falls under tax minimization, which focuses on gathering information concerning tax base, tax rates, and after tax interest.(Schanz and Schanz 2010, p. 9) The final phase involves evaluation of the investment decision and the impact of tax. During this phase, an organization evaluates the profitability of available investment channels both before and after considering taxes.

3. Case Studies on MNC's Taxation Systems: South Africa, The Republic of Ireland, and The United States

This section presents case study concerning the effect of anti-avoidance laws on the location of MNC's patent ownership and R&D activities. The first section presents a brief overview of the international tax architecture, including the two alternatives, the worldwide system and the territorial system. Afterwards, the laws in the three jurisdictions that were selected for focus, including South Africa, the United States, and the Republic of Ireland are discussed. These three countries were selected because the first is the home country, while the second and the third countries comprise fairly large economies and popular destinations for MNCs regarding filing and location of intellectual property rights and R&D activities. The next part of the case studies focuses on the main international tax avoidance mechanisms, including transfer pricing, international debt shifting, tax treaty shopping, tax deference, corporate inversions and headquarter location, and strategic location of IPs. The last part will provide a theoretical background on tax avoidance. The first part covers South Africa's taxation system. The approach taken is to analyze trends using theory, which can allow for the development of propositions that future studies can employ to generate hypothesis for testing through empirical literature.

3.1. Architecture of the International Tax System

Countries usually follow one of the two popular international taxation systems, the territorial model or the worldwide approach are considered. Both these models were developed in reaction to the tendency for MNCs to exploit loopholes in a resident jurisdiction's tax laws to reduce their tax burden or liability. Recognizing the nature of MNCs tax practices, some have dubbed MNCs taxation strategies as separate accounting, meaning that taxation of these organizations is at the

level of individual subsidiaries which operate in different jurisdictions (Beer et al. 2018, p. 5).[10] The various approaches that the organizations use, including strategic location of intangible assets, mainly IPs and R&D activities, among others, will be discussed later in this chapter. Prior to describing the two models in the international tax architecture, it is also important to understand when an MNC can be taxed by a given jurisdiction. First, it is critical to acknowledge the complex nature of MNC's operation, in which income is generated on two fronts, whereby these organizations make profits by selling goods or services or by investing their additional cash (Beer et al. 2018). A country has a right to tax an MNC if the source of the company's income and the residence of that firm is within the jurisdiction of the concerned state. The notion of source refers to the place where investment and production activities are based, and tax commissioners rely on the physical presence of capital and labor as the criteria for determining source (Klemm and Liu 2021). Overall, the international tax system relies on the physical location of a taxpayer's operations and business to impose a tax obligation.

Despite the significance of an MNC's physical location, taxation rules have some specificities. While the notion of source, as observed earlier, refers to a taxpayer's physical presence, Beer, de Mooijn, and Liu (2018) clarify that certain thresholds must be met before a taxpayer's permanent establishment (PE) is defined. The authors proceed to explain that the residence of a firm is the place where the organization receiving the income has its primary location; hence, in practice, the test of residence is usually determined on the basis of the place of an organization's incorporation or management. More important, in the international taxation system, source countries retain the

[10] Given that each country has a right to tax the income assigned, based on its domestic law and tax treaty obligations, the taxing rights of a country over MNC income are based on the source of the income and the residence of the corporate taxpayer (Beer et al. 2018, p. 5).

taxing rights over MNCs active income generated from PEs, while resident countries have the right to tax the subsidiaries passive income (Beer et al. 2018). Active income comprises the proceeds of product and service sells, while passive income is accrued from investment of MNCs cash on hand in a resident or host country through a subsidiary (Beer et al. 2018). The question that remains concerns how a country taxes an international company.

3.2. Territorial vs Worldwide Taxation System

A country may tax an MNC on the basis of one of two international tax systems. These systems include the territorial system and the worldwide model (Klemm and Liu 2021). The territorial system, which is employed in Europe and Japan, is one in which countries that host subsidiaries of MNCs exempt the organizations' foreign earnings from tax, meaning that the active income of these countries is only taxed in the source country (Beer et al. 2018). The source country in this case is the jurisdiction in which the headquarters of the MNC is domiciled.(Beer et al. 2018). The worldwide model, conversely, is employed in countries such as the United States, China, Russia, Brazil, India, and South Africa, and, in this system, the host country of a subsidiary has the right to tax the active income of MNCs from all source countries (Beer et al. 2018). However, to avoid double-taxation, the host of the resident jurisdiction grants MNCs a non-refundable foreign tax credit against the organization's own tax. Consequently, the tax that the host country charges is limited to the taxable income generated in its territory over the taxable income accrued in the source country. In other words, the worldwide system charges tax on the excess income an MNC earns through the commercial activities of a subsidiary. However, researchers acknowledge that while the two international tax systems are defined differently, in practice, such difference tends

to be blurred (Beer et al. 2018). The lack of a clear-cut distinction is attributed to certain permissions in the worldwide system, with specific emphasis on the deferral rule.[11] Under this rule, jurisdictions defer MNC's dividend tax obligations until the time when the funds are repatriated back from subsidiaries located oversees or when excess credits from high-tax countries are used in a low-tax country (Beer et al. 2018, p. 6). In this regard, companies benefit from growing or investing this income.

Over the years, countries around the world have implemented various anti-avoidance mechanisms to curb international tax avoidance practices by MNCs (Klemm and Liu 2021). These measures comprise detailed transfer pricing regulations, controlled foreign corporations (CFC) rules, thin capitalization regulations, and GAARs.[12] Moreover, the measures have transcended the national level, with transnational institutions, mainly the Organization for Economic Cooperation and Development (OECD), which responded to increased calls to curb profit shifting or transfer pricing through the G20-OECD base erosion and profit shifting (BEPS), also involved (Klemm and Liu 2021). Following the G-20 OECD initiative, some member states agreed to commit to four minimum standards concerning abuse of the BEPS treaty, which would see these countries adopt common legislative approaches against tax avoidance. Overall, the international taxation system comprises two models that are used to impose a tax obligation on MNCs, but the difference between the two approaches is not always clear-cut. Realizing the weakness of this system, some OECD countries have taken proactive measures to ensure that they limit MNC's tax avoidance loophole,

[11] Beer, de Moij, and Lui (2018) explain that 'In practice, the distinction between worldwide and territorial systems is not as clear-cut. Some provisions in existing systems, such as the deferral of dividend tax obligation until repatriation or the use of excess credits from high-tax countries to offset taxes on dividends from low-tax countries (cross-crediting), tend to soften the bite of worldwide taxation' (p.6)

[12] *See* Beer, de Mooij & Liu (2018 pp7-10). The authors explain various approaches that MNCs employ to lower their tax obligation. The researchers dub transfer pricing as transfer mispricing and they add other approaches, such as tax treaty shopping and corporate inversions and headquarter location.

while others have sought to lure these organizations into their jurisdictions. The next sections will discuss case studies from three countries that either prevent tax avoidance or attract MNCs will relatively permissively tax regimes.

3.3. South Africa

South Africa embraces a binary approach to taxation, in which while residents are taxed on their worldwide income, conversely, foreigners are taxed based on the source of their income.[13] In South Africa, Dachs and Snyckers (2019) note that a resident tax payer is expected to pay capital gains tax on the disposal of all assets that they hold. Contrastingly, the tax obligation of non-residents only involves immovable assets that the party holds in the country, interests therein, and assets attributable to a permanent establishment on South African territory (Dachs and Snyckers 2019). Similarly, in certain cases, foreign parties are obligated to pay withholding tax, and the country has an established controlled foreign company tax regime. Hence, South Africa has a robust taxation model, with both resident and non-resident entities contributing to the country's tax basket.

Despite South Africa's comprehensive tax system, several incentives have been put in place to attract foreign direct investments (FDIs). These incentives particularly comprise regulations governing taxation of various types of FDI-related firms, including venture capital companies (VCCs), real estate investment trusts (REITs) based on the definition in South Africa's Income Tax Act, and the headquarter company (HC) regime. While the South African tax regime does not permit

[13] "A company is a 'resident' for South African income tax purposes if it is incorporated, established, or formed or has a place of effective management (POEM) in South Africa, unless such company is deemed to be exclusively a resident of another country in terms of a DTA. Subsidiaries of foreign companies incorporated, established, or formed in South Africa, or that have their POEM in South Africa, will constitute a 'resident' and will be subject to tax in South Africa on a residence basis" (Dachs and Snyckers 2019 p.183).

taxation on a group or consolidated basis, based on the provisions regarding corporate taxation, the tax commissioner may impose certain obligations on a tax-rollover basis.

South African taxation laws that influence location of patents and R&D activities mainly concern transfer-pricing rules. According to Dachs and Snyckers (2019), transfer pricing rules apply to any commercial activity that is covered under affected transaction, and which might accrue a tax benefit to any party to the transaction. Additionally, thin capitalization, which will be covered later, is also tackled under transfer pricing rules in South Africa. Particularly, transfer-pricing regulations are established in Section 31 of South Africa's Income Tax Act. In a broad sense, these rules are triggered in two instances. First, the regulations are triggered in the event any scheme, agreement, operation, and understanding falls under an affected transaction, and, essentially, such a transaction usually involves connected persons, who comprise a resident, a non-resident, a permanent asset of a non-resident that is physically located in South Africa, and another resident's foreign permanent asset or establishment (Dachs and Snyckers 2019). Secondly, these rules are invoked when transactions result in the accrual of tax benefits because of the commercial exchanges (Dachs and Snyckers 2019). More important, when a transaction triggers transfer-pricing rules, Section 31 of South Africa's Tax Act requires adjustments at different levels. These adjustments operate in two ways. The first of these adjustments is a primary correction, in which the tax payable by the party that enjoys the benefit is computed based on the assumption that the transaction had been entered into at an arms' lengths. Under the second correction, secondary adjustment, which comprises the difference between actual terms and conditions and the arm's length rule, conversely, South African law requires that the difference be conceptualized as a dividend that includes a distribution of an asset specific to an investor from overseas.

3.4. Ireland

Compared to conventional tax systems, the Irish model is increasingly open, which has attracted heavy FDI inflows from multinational firms, investment firms, and aircraft leasing corporations. Certain key features stand out, and at the top of the list is the 12.5% corporation tax charged on trading income (Quinn and Burke 2019, p. 76). This tax is insignificant compared with other investment destinations. However, other elements of the Irish tax regime also serve to incentivize foreign investments, and they include a special purpose company regime, a tax-exempt regulated funds regime, broadly defined tax exemptions, a network in the excess of 74 double tax treaties, and participation exemption for gains on share (Quinn and Burke 2019).[14] Ireland's tax regime is broad, and the system is intentionally designed to attract MNCs into the country. Hence, Ireland has a widely open tax regime, characterized by systematized approaches to attract MNCs and FDI inflows into the country's economy.

To a significant extent, one gathers that the Irish have developed an international tax strategy to lure MNCs. However, the system features both aspects that focus on combatting tax avoidance while increasing transparency, since the Irish are committed to OECD BEPs initiative (Quinn and Burke 2019). Furthermore, Ireland's has not merely paid lip service to the OECD initiative, as, according to Quinn and Burke, the country has taken active steps aimed towards implementation of the BEPS recommendations. Among the key areas that the Irish have addressed, which are in

[14] "Where a payment is made from a jurisdiction with which Ireland does not have a double taxation agreement, the domestic Irish tax legislation provides for unilateral credit relief. This may be available where foreign tax is incurred by a branch of an Irish resident company, where interest withholding tax has been incurred or when a parent company that is resident in the state receives a dividend from its subsidiary in respect of which tax has been paid" (Quinn and Burke 2019 p.78).

line with the OECD initiative include CFC and exit tax, anti-hybrid measures, and interest limitation initiatives (Quinn and Burke 2019). The anti-hybrid measures are also in line with the European Union's (EU's) Anti Avoidance Directive (ATAD) (Quinn and Burke 2019). Another key development in the Irish tax regime is the ratification of Ireland's choices under the OECD Multilateral Instrument, and, starting May 1, 2019, the law came into effect (Quinn and Burke 2019, p. 76). The Multilateral Instrument is a method that empowers jurisdictions to swiftly tax multilateral companies' packages based on accepted standards. Its purpose is to curb tax evasion and correct tax anomalies. Similarly, Ireland has implemented the EU Directive of Administrative Cooperation 6 (DAC 6) rules, which make exchange of information concerning aggressive tax planning practices by cooperations mandatory for member states of the EU (Quinn and Burke 2019). Ireland's approach to international taxation is increasingly open compared to other countries around the world. More important, Ireland grants MNCs relief for foreign taxes incurred on payments made to an Irish tax resident firm, which is made possible by a corresponding double tax treaty. In the event Ireland does not have a double taxation agreement with the corresponding jurisdiction, the Irish tax law provides for a unilateral credit relief; hence, one can conclude that an MNC from any part of the world can obtain tax relief from foreign taxes under Irish international tax regulations. Overall, increasingly attractive reliefs and credits for foreign taxes, which are enhanced by double tax treaties and unilateral credit relief rules, characterize Ireland's international tax system.

The Irish system requires that the activities that characterize the R&D basis of a tax credit application should be aimed at not only achieving an advancement in technology or science but also resolving a science or technology problem (Quinn and Burke 2019, p. 79). This indicates an emphasis on technology by the country in its taxation process. Secondly, the Irish tax regime provides

that in the event an organization's corporation tax is below the set threshold against which it can claim the R&D tax credit, the firm may apply for the credit during the preceding or next year; alternatively, the application may be carried forward indefinitely. Similarly, if the company is a member of a consortium of firms, the credit may be awarded to another member of the same group. Another avenue through which the R&D credit may be enjoyed involves applying for a payable credit from the Irish tax commission or alternatively surrendering the claim to key employees, who may in turn use it to settle or offset their income tax liabilities.

Under Irish tax law, companies qualify for capital allowances for capital expenditures on intangible assets, including IP assets, which are needed to conduct trade; however, the relief applies to more than just patents, as other IPs, including copyright, know-how, and trademarks, qualify for relief (Quinn and Burke 2019). This relief is usually granted as a capital allowance, which can be used to settle off tax against profits that arise from the use of the intangible assets; hence, this relief is widely recognized as a tax depreciation relief (Quinn and Burke 2019). Consequently, companies are permitted to write off the relief as a depreciation or amortization charge in their books.

3.5.The United States Tax Regime

Owing to the complexity of tax laws in the United States, the focus of this case study will be on the most recent change regarding taxation of corporations.[15] The law that implemented this change was the GOP-sponsored Tax Cuts and Jobs Act (TCJA) of 2017 (Schwartz and Edgar 2019). This law was in line with the Republican Party's principles, in which conservatives prefer to impose

[15] "The United States generally imposes tax on the net worldwide income of individual US citizens and permanent residents as well as corporations organised in the United States or any of its political subdivisions" (Schwartz and Edgar 2019 p.261)

minimal tax obligations on corporations, with the expectation that the approach will encourage investment and create jobs. In other words, the GOP's view is that the rich are motivated to spend their money in economies that do not extract a significant portion of the returns made on investments. The Republican view is highly appealing to corporations, which have a business objective to maximize profits while reducing cost. This perspective is particularly appealing given that tax represents a cost in business; hence, businesses seek to implement strategies that limit this expense.

TCJA made several notable changes to corporate taxes with far reaching implications. Among the major changes that the law made was lowering corporate income tax from 35% of earnings to 21% (Schwartz and Edgar 2019). This reduction was quite significant for companies that generate high incomes, meaning that they paid a notable portion of their earnings in taxes. This measure was further enhanced with other changes, including increasing the breadth of offshore income classes that were subject to taxation in the United States, subjection of untaxed corporate income to a one-time repatriation tax, and exemption of dividends from foreign subsidiaries from corporate gains tax through the limited participation exemption (Schwartz and Edgar 2019, p. 260). This basket of tax considerations changed the tax system considerably much to the relief of multinational companies.

3.6.International Inter-Firm Transactions

In the United States, the Code recognizes that the country's economy partly relies on the exploitation of intangible assets.[16] The problem is that these intangible assets are highly portable; however,

[16] GILTI and FDII sweep more broadly than the word 'intangible' implies and need to be considered by any US corporation that earns income abroad, directly or through subsidiaries (Schwartz and Edgar 2019, p. 265).

the code takes such portability into consideration, and it respects the legal form for which a tax-payer opts with regard to their owned intangible asset, including patents and copyrights. Nevertheless, following controversies surrounding the tactics of MNCs that are aimed at lowering their tax obligation by exploiting opportunities in law, the Tax Cuts and Jobs Act of 2017 (TCJA 2017) sought to resolve some of the problems that the government usually faces, when it comes to taxing intangible assets.

Particularly, the TCJA approaches this problem in two ways. The first approach, which is dubbed the carrot, involves the foreign-derived intangible income (FDII), while the second approach, which is dubbed the stick, involves the global intangible low-taxed income (GILTI) (Schwartz and Edgar 2019). More important, as Schwartz an Edgar conclude, these two provisions extend the meaning and breadth of the notion of intangible. Consequently, US MNCs doing business overseas need to consider the two provisions at length, as they have notable implications on income earned either directly through the MNCs' operations in the United States and indirectly, through the corporations' operations via a subsidiary located abroad. The following sections will discuss these two laws at length.

3.6.1. GILTI

The Code covers GILTI under Section 951A. The section provides that American shareholders, including companies and individuals, who own stock in a CFC either indirectly or directly must include GILTI in their income (Schwartz and Edgar 2019). GILTI is defined as follows:

> The excess of a US shareholder's aggregate pro rata share of the net 'tested income' of each CFC of which the shareholder is a US shareholder over 10 per cent of the CFC's 'qualified business asset investment' (QBAI), reduced by the interest expense taken into account in calculating the US shareholder's tested income

(to the extent corresponding interest income is not taken into account). (Schwartz and Edgar 2019, p. 266)

The notion of tested income as implied above refers to the gross income of an MNC's subsidiary less the income from the parent company that conducts business directly in the United States. Additionally, tested income comprises Subpart F income, under section 951A (c) (2) (A) and dividends received from certain related parties together with deductions that are properly allocated to the income (Schwartz and Edgar 2019). QBAI is the average of a subsidiary's tangible property that generated the income in question, but the value is calculated on a depreciating asset. To avoid the complexities that are inherent in the definition of GILTI, one way to understand the impact of the law on MNCs and their tax obligation is to analyze the intention of Congress with this law. To this end, Congress had one objective. Particularly, legislators sought to subject income earned from intangible assets that an MNC held in a CFC to current taxation, while holding that all income, with the exception of the 10% return on a CFC's investment in a patent for instance comprised earnings from intangibles (Schwartz and Edgar 2019, p. 266). TCJA incentivized repatriation through specific provisions.

Two new tax benefits under GILTI were highly relevant to corporations. The first of these benefits came under Section 250, which, as Schwartz and Edgar explain, allowed corporations to reduce their tax obligation under GILTI by 50%, which would fall to 37.5% after December 2025. This was a huge benefit to investing companies and it was set to be even more lucrative to these investors in the coming years**.** More important, the implication of this provision was that corporations were taxed GILTI at the rate of 10.5% and the rate would apply for all taxable years prior to 2025, after which the rate would rise to 13.125%. Additionally, American corporations would qualify for a tax credit on payable foreign taxes if they were deemed paid in respect to GILTI (Schwartz

and Edgar 2019). However, it is important to note that the Biden administration, intends to reverse these laws with proposals to increase the GILTI to 21%, while doing away with the QBAI exemption.

Another notable legislation passed by Congress was the FDII. The operational concept behind FDII is similar to the intent of congress under the GILTI. The FDII is applied in addition to the GILTI, whereby, under Section 250 of the Code, MNCs qualify for a 37.5% deduction in respect of FDII; however, the rate is scheduled to drop to 21.875% beginning 31st December, 2025 (Schwartz and Edgar 2019). Without the FDII, MNCs would have little incentive to invest and earn income in the United States, since the GILTI alone makes it attractive to invest overseas through CFCs.

4. Patent Shifting: Linking Literature to Theory

After establishing how different countries approach the issue of corporation tax, this chapter seeks to put the findings of the tax regimes in the three case studies into perspective. Particularly, the chapter examines existing evidence on the impact of tax regimes on corporate patent location practices of global firms.

Income generated from intangible assets tends to be highly mobile. This trend is attributable to the fact that IP generates virtually no trade costs, meaning that it can be held in a country different from the source. Reports from different sources indicate that MNCs tend to exploit this characteristic of intangible assets, including patents, to avoid high tax obligations (The Guardian 2009; Schwartz and Duhigg 2013). In the United States, Apple has faced accusations of employing a web of subsidiaries that are complex and are spread on multiple continents to lower its tax obligation in the tech-giant's home country (Duhigg and Kocieniewski 2012; Schwartz and Duhigg 2013). Similarly, in Europe, MNCs listed on the FTSE100 have appeared in media reports over allegations of quietly offshoring legal ownership of their highly priced trademarks to tax havens (The Guardian 2009) .Governments have responded to these media reports with targeted legislations that seek to narrow the scope of corporations' tax-avoidance. Researchers, on the other hand, have sought to develop evidence and literature on the strategies that the corporations' resort to and the mechanisms that governments employ in response to controversial corporate practices regarding patent-transfers to low-tax jurisdictions. Overall, the increased interest in MNCs patent shifting practices is attributed to the fact that the conduct involves large amounts of money and assets worth millions of dollars.

Income shifting through patent-relocation to low tax havens has received notable attention from researchers. In one-study, investigators analyzed empirical evidence of MNCs IP shifting methods and the degree to which countermeasures by governments were prepared to combat the practice (Baumann et al. 2018). In a closely related study, Amberger and Osswald (2021) investigated how patent concentration impacted tax-motivated income shifting.[17] Griffith, Miller, and O'Connell (2014) considered the influence of corporate income taxes on the location of firms' IP rights. Exploiting a unique dataset that connects information on patent applications to micro-panel data for European MNCs, the results from the study by Karkinsky and Riedel (2012) revealed that the corporate tax rate in a given jurisdiction negatively influenced the number of patents filed by a subsidiary. Alstadsæter and others, in an investigation on the factors that determine patent registration in several countries, reported that patent boxes had a significant effect on location of registration, and this trend was attributable to their favorable tax treatment. Lastly, Abramovsky et al. (2008), using data from various European countries, investigated how companies organized their innovative activities, and the researchers reported that a notable proportion of innovative activities in a given country would be attributable to foreign MNCs, and applicants of these patents were increasingly likely to be subsidiaries of other firms. Hence, extant literature demonstrates that patents are not always located in their country of origin, which predominantly tend to be highly developed economies with a high corporate tax burden.

[17] The study identifies patent concentration as an important driver of tax-motivated income shifting and suggests that the size of the local tax authority's information set is critical in curtailing potentially aggressive tax strategies. Hence, in order to be effective, tax-policy measures must broaden this information set.

In the studies above, while researchers focus on relatively similar topics or areas of study, the findings reveal various trends regarding the impact of corporate taxes on patent location. The primary question on which researchers focus regards whether tax laws influence corporations' IP shifting strategies. In one study, researchers reported that low corporate tax rates play an important role in attracting patents. Furthermore, the move by MNCs to relocate patents to low-tax jurisdictions is usually characterized by a geographic separation of R&D input and output location (Baumann et al. 2018). To put it differently, the strategy that companies employ usually involves making clear distinctions between where patents are invented or developed and where they are located. To achieve this objective, Baumann et al. (2018) highlight two strategies that companies employ. Firstly, as the authors explain, MNCs may resort to contract research, in which a CFC comes into an agreement with its parent company that involves the latter conducting R&D functions on behalf of the former. More importantly, while the MNC is largely responsible for inventing and/or developing patents, the CFC remains the owner of the completed IP. Apart from contract researching, another approach that MNCs employ is cost-sharing agreements. In this approach, as Baumman et al. (2018) explain, an MNC shares the cost of developing patents with a CFC, which is usually located in a low-tax jurisdiction. The objective of these strategies is to enable the MNC to accrue the benefits of low tax rates on patent income, while retaining patent research activities in developed countries that often impose high tax obligations on corporations. More important, despite their high tax disadvantage, it is highly advisable to retain R&D activities in these countries because of their non-tax benefits, including access to highly skilled human resources, state-of-the-art infrastructure, not to mention proximity to an MNC's headquarters (Baumann et al. 2018).

Baumann et al. (2018) confirm these considerations, noting that the majority of the patented technologies that CFCs in tax havens own were invented in a foreign country, with the share of foreign-

invented patents in high tax economies relatively small. At the same time, the researchers correlated the propensity to differentiate ownership of a patent from the source country and to relocate it in a low-tax jurisdiction with the tax rate of a source jurisdiction. Hence, one can conclude that tax rate considerations play a central role in MNCs decisions to participate in patent relocation schemes.

Researchers also reveal features regarding the specific nature of patents that are involved in MNCs patent relocation schemes. Baumann et al. (2018), in particular, report that MNCs are renowned for seeking high-value patents in low-tax countries while low value patents remain in high tax countries. The results of the study, as the researchers explain, suggest that MNCs propensity to shift patent ownership from the source country to a low-tax jurisdiction rises with the value of the IP and its potential to earn, as a measure of family size, the number of technology applications, and the number of forward citations of the patent application (Baumann et al. 2018). This finding is in line with previous studies' result, which have ascertained that corporate taxation has a distorting effect on not only the location of heterogeneous assets but also their functions (Haufler and Stähler 2013).[18] Elsewhere, researchers have investigated whether patent-concentration drove MNCs' tax-motivated income shifting (Amberger and Osswald 2021). The notion of patent concentration refers the relative share of patents that an MNC holds (Amberger and Osswald 2021). The researchers employed data from the Bureau van Dijk's Orbis database, which they linked with Worldwide Patent Statistical Database (PATSTAT) (Amberger and Osswald 2021). The latter assembles critical information on patents, including applications, ownership, citations, grants, and

[18] The study indicated that a unique, asymmetric Nash equilibrium can be shown to exist, provided that countries are sufficiently different with respect to their exogenous market conditions. In equilibrium a larger country levies the higher tax rate and attracts the high-cost firms. A simultaneous expansion of both markets intensifies tax competition and causes two competing countries to reduce their tax rates, despite higher corporate tax bases.

identity affiliates, among other key features. The researchers report that MNCs' tax-motivated income shifting practices increase with patent concentration, and the effect is economically significant. To test whether patent concentration has a limiting effect on a local authority's information set, the researchers examine three contexts that provide variation in the degree of information readily available to the local tax authority. Consequently, the researchers begin by exploiting variation based on comparable data from patent-holding affiliates of other firms. This approach is based on the assumption that the local authority could refer to the royalty receipts of these other companies as external reference points. The researchers confirm that the presence of local patent-holding subsidiaries has a reductive effect on a focal MNCs' transfer-pricing discretion, which in essence means that these affiliates moderate the relationship between patent concentration and income shifting (Amberger and Osswald 2021). What the researchers are arguing here is that MNCs are dissuaded from employing tax-avoidance schemes through patent shifting if the relative number of affiliates that own comparable patents are found within a jurisdiction in question.

The influence of corporate income taxes on the location of IP has also attracted some attention. In one study, the results pointed to the fact that corporate tax rates played an integral role on choice of patent location (Griffith et al. 2014). This is an indication that there's a deliberate policy to determine where to locate legal ownership of patents. The researchers reported that firms continuously engage in R&D activities, and, more often, these processes result in novel ideas. More important, MNCs expect to earn from such ideas. The ideas that arise from R&D activities usually exhibit variations in their value. Firms often face the question of determining where to locate the legal ownership of IP, and MNCs make their decisions based on the rate of tax that a given jurisdiction will impose on them on all income generated using the patented idea (Griffith et al. 2014).

While unobservable attributes of ideas are also considered, and they sometimes feature in the location decisions of firms, the rate of taxation remains the prevailing factor that ultimately determines the jurisdiction of choice. Like Bauman et al. (2018), Griffith, Miller and O'Connell (2014) confirm that high value ideas are more tax sensitive, compelling firms to prefer locating related patents in low-tax jurisdictions. Destinations of choice may include tax havens such as Cape Verde, Cayman Islands and Cook Islands.

3.7. Theoretical Literature on Transfer Pricing

From the forgoing discussion, one gathers that income-shifting practices in MNCs are motivated by the potential to accrue tax benefits. Relocating income from a jurisdiction with a high corporation tax (t_{hf} =tax-rate in a high-tax overseas jurisdiction) to a jurisdiction with relatively low taxes (tax rate = t_{lf}), the firm generates savings (t_{hf} - t_{lf}) for each unit of income that the company shifts (Blouin 2012, p. 38). For firms that conduct business in jurisdictions that employ a territorial system, the resulting savings are permanent (Blouin 2012). Contrastingly, the case for firms that conduct their commercial operations in jurisdictions that embrace a worldwide taxation model, the value of savings is dependent on several factors. Using the example of the United States, first, if the t_{hf} is higher than the tax rate in the United States ($t_{hf} > t_{us}$), then firms will predominantly embrace an income shifting strategy from the high tax jurisdiction (Blouin 2012, p. 38). While profits facing high tax jurisdictions may result in excess foreign tax credits (FTCs), firms may only enjoy these benefits after repatriation of income from foreign subsidiaries and cross-crediting with repatriations from other low-tax countries (Blouin 2012). The implication here is that if a firm opts to suspend repatriation, the company loses the time value of money on the extra FTC that it would have received from the compensating state. Secondly, it is only rational for a firm to shift income from a t_{hf} to a t_{lf} if the consequent tax savings accrued exceed the cost the firm incurs to transfer

the income. More important, Blouin (2012) explains that the benefit of income shifting to a t_{lf} is mitigated by repatriation of the low-tax earnings. In other words, while a taxpayer in a high jurisdiction shifts their income to a low tax jurisdiction, since the individual remains domiciled in the high tax jurisdiction, they can only enjoy the tax savings after repatriating the income back to their home country. The implication of this statement is that the actual reason for income shifting is not to enjoy tax savings; contrastingly, the primary motivation is to defer tax payments, which allows the taxpayer to enjoy the time value of money.

3.8. Determinants of Location Choice

Extant literature signals that firms engage in patent-relocation practices. However, the analysis has not examined how firms make specific decisions regarding legal location of patents. To this end, Griffith, Miller, and O'Connell (2014) developed an empirical model in a bid to capture the determinants of location. The first variable in the model was an MNC's payoffs.

3.8.1. MNC Payoffs.

Payoffs denote the benefits accruing from patent relocation. In other words, emphasis is on determining the tangible benefits of relocating from jurisdiction 'A' to jurisdiction 'B', by closely computing the tax savings accruing from the decision. Griffith, Miller, and O'Connell (2014) present a model to illustrate how an MNC decides the location of the legal ownership of its patents. In the model, firms are indexed as $f= 1, \ldots. F$, and they realize ideas, which the model indexes as i=1, ….*I.* These ideas arise over time *t,* and every idea is attributable to either a single patent or several patents, which the model indexes as $p = 1,\ldots P$. The country or jurisdiction in which the MNC decides to legally locate the patent is indexed as $j= 1,\ldots J$ (Griffith et al. 2014, p. 14). This model assumes that all patents that a company secures, which are technologically related, are part of the same idea. More important, under this model, the MNC selects the jurisdiction with the highest

payoff as the legal location of the company's patent. This payoff is a function of the tax rate that the organization expects to face, which the model indexes as T_{fjt}. Moreover, the value of the payoff is dependent on the quality of the idea (q_i) and on whether the R&D activities that gave rise to the idea are located at the destination of choice $a_{ijt.}$ Other critical factors that determine the value of the patent comprise the robustness of the jurisdiction's IP laws and the level of technological innovativeness, which is given as a measure of the share of expenditure on technological innovation in the GDP, and the vector X_{jt} captures this phenomenon in the model. Lastly, the model is fluid, allowing the influence of both unobserved and observed factors to vary across firms; hence, the subscript $r=1,\ldots, R$ reflects industry-firm size category. Hence, the payoff that an MNC *f* generates from locating the legal ownership of a patent *p,* which is attributed to an idea *i,* in location *j* takes the following form:

$$\pi_{pjt} = \alpha_i \tau_{fjt} + \beta_i a_{ijt} + \gamma_r x_{jt} + \xi_{rj} + \epsilon_{pjt} \text{ :(Griffith et al. 2014, p. 14)} \quad (1)$$

Two parameters, including αi and βi are determined by both observable and unobservable idea features, and they vary from one idea to another. Hence:

$$\alpha_i = \bar{\alpha}_r + \alpha_r q_i + \sigma^{\tau}_r \eta_i;\ \eta_i \sim N(0,1),\text{(Griffith et al. 2014, p. 15)} \quad (2)$$

$$\beta_i = \beta_r + \sigma^{a}_r \nu_i;\ \nu_i \sim N(0;\ 1),\text{(Griffith et al. 2014, p. 15)} \quad (3)$$

The model assumes that η_i and ν_i are not only uncorrelated with each other but also with the other covariates. Similarly, the model hypothesizes that the additive shock ϵ_{pjt}, is a distributed extreme

value. Conversely, ε_{rj} indexes the fixed effect size of location-industry size. Hence, the firm decides to locate legal patent ownership in location *j* if:

$$\pi_{pj^{*}t} > \pi_{pjt} \ \forall \ j \neq j^{*}, \text{(Griffith et al. 2014, p. 15)} \qquad (4)$$

Hence, the payoff's model presents a unique approach to identifying the location of MNCs patents' legal ownership. Building on this model, one can focus on the parameters relating the marginal impact of tax on payoffs that a firm considers before arriving on an ideal choice of location. Previous studies have illustrated that effective models need to integrate random coefficients which account for variations in location choices in response to tax variations that MNCs face in different locations (Train 2003). Particularly mixed logit is a highly flexible model with the capacity to approximate any random utility. This model obviates the three shortcomings of conventional logit, as it permits random test variation, unrestricted substitution patterns, and correlation in unobserved factors over time (Train 2003). This contrasts with probity, which is restricted to normal distributions. In Griffith, Miller, and O'Connell's (2014) model, the mean of the random coefficient is conceptualized as a fixed coefficient. Hence, one can surmise that the model is pinned down by variation in choices of location in response to changes in taxes that MNCs face.

3.9. Conclusion of the Case Studies

This chapter presented the case studies on the effect of anti-avoidance laws on the location of MNC's patent ownership and R&D activities. The chapter began with a presentation of the two popular tax approaches in the international system, including the territorial approach and the

worldwide model. Afterwards, a discussion of the three selected jurisdictions' tax laws was presented. The third section of the chapter analyzed evidence from existing studies on patent-shifting practices of MNCs, before concluding by putting the practices under a theoretical lens. The analysis establishes that MNCs have aggressively sought tax avoidance through patent shifting, but the mechanisms that countries employ are not sufficient in targeting such income shifting practices. Hence, from the observations, the effect of anti-avoidance laws may be correlated to location of the legal ownership of MNCs' patents together with their R&D activities.

5. Results of the Qualitative Search

Apart from the case studies, the analysis also conducted a qualitative search of studies on MNCs patent shifting and tax avoidance practices. The process generated articles from six databases, including Google Scholar, EBSCO, ProQuest, Dialog, SSRN, and Econlit. The search results returned 1,670 articles. However, after eliminating articles with abstracts only and those that were not in English, 79 articles remained. The next step involved analyzing the titles of the remaining articles for relevance, and 45 articles were eliminated, leaving 34 sources for further analysis. Subsequent re-reading of the abstracts of these articles eliminated 24 records, leaving 10 sources for inclusion in the final analysis (Table 1). These articles were read in full to establish major themes of the topic (Griffith et al. 2014; Cédelle 2016; Alstadsæter et al. 2018; Baumann et al. 2018; Collier et al. 2018; Knoll and Riedel 2019; Hak and Andrilic 2021; Hebous 2021; Klemm and Liu 2021; Schatan 2021). Three of the studies included in the analysis manipulated empirical data from the European Patent Office (EPO) Worldwide Patent Statistical Database (PATSTAT) (Griffith et al. 2014; Alstadsæter et al. 2018; Baumann et al. 2018). The EPO data employs a unique domain model comprising three levels, including family, application, and publication. The primary object in the model is the application, which denotes the request one files with the EPO for protection of their patent concerning a unique invention. Primarily, during the life of a patent, various publications are issued. Other domains in the PATSTAT database include title, abstract, legal event, classification, publication, person, technical field, industry, citation, and non-patent literature. These domains are primarily descriptors of the information contained in the PATSTAT database. Hence, citation for instance is a descriptor of data on references from patent applications to documents, which are considered relevant to the patent procedure. Conversely, classification

arises because all patent applications are clustered based on their technical content by a unique symbol or code.

The period of the PATSTAT data in the empirical analysis studies varied. In one study, the researchers used PATSTAT data for the period 1990-2006 and the data comprised up to 100,000 patent applications per year (Baumann et al. 2018, p. 5). In another empirical study included in the analysis, researchers employed data on 1083 parent companies, which had 4,823 patenting subsidiaries, and these subsidiaries had filed 379,849 patent applications between 1985 and 2005 (Griffith et al. 2014, p. 16). In the last empirical study, the researchers employed EPO PATSTAT data on global R&D investors from 39 source countries in 33 different host-states for the period between 2000 and 2012 (Alstadsæter et al. 2018, p. 10). The majority of the studies included in the review were descriptive, attempting to analyze the effectiveness of anti-avoidance measures on preventing profit-shifting strategies of MNCs (Griffith et al. 2014; Knoll and Riedel 2019; Schatan 2021). One study focused on patents by digital companies, concluding that it is fairly easy to shift intangible assets from one jurisdiction to another; hence, without abuse-proof regulations, the nature of these assets creates an avenue for aggressive tax planning by MNCs (Hak and Andrilic 2021). Elsewhere, while one study focused on clarifying whether tax competition was harmful, researchers covered cross-border spillover effects from tax competition, in which a given company relocated its paper profits in a bid to lower the tax paid in their traditional jurisdiction (Hebous 2021).

3.1. Anti-Avoidance Laws and Profitability of MNCs in High-Tax and Low Tax Regimes

After presenting a brief description of the general characteristics of studies included in the analysis, this section refocuses the analysis to the research questions. The first and second research questions sought to answer how anti avoidance laws affected profitability of MNCs in different tax regime, including high- and low-tax regimes. Griffith and others in an attempt to answer this question focused on the issue of firm behavior. The researchers reported that when an MNC develops a new idea, its core objective is to generate income by applying that idea in the future (Griffith et al. 2014, p. 14). The authors also reported that ideas tended to vary in terms of both their potential to earn and the number of patents they can generate; hence, while some ideas were high earners, others tended to be low earners. Moreover, some ideas could be connected to a single patent, while others generated more than one patent. More important, according to Griffith and others, MNCs were continuously faced with the decision of where to locate each of their patents, and these companies made their decisions based on the tax that they were expected to pay on income generated using the patent. However, the researchers clarify that the degree to which MNCs planned their activities in a way that income could reasonably be deemed to be connected to the subsidiary that owned a patent often varied. Hence, while some companies made location decisions based on the jurisdiction that allowed them to maximize profits, others were largely swayed by locations in which real innovative activities were taking place (Griffith et al. 2014). The results of Griffith, Miller and O'Connell's (2014)study indicated that the mean marginal impact of tax on payoff from locating legal ownership of a patent in a given jurisdiction was negative and statistically significant across both parent size countries and industries. At the same time, the payoff for high quality patents in both engineering and electrical industries were increasingly sensitive to taxes (Griffith et al. 2014).

However, the study also indicated that compared to placing legal ownership in a location, having real innovation activity in a location was linked to higher payoffs.

While Griffith described the impact of patent location on payoffs, including both in low-tax and high tax jurisdictions, Alstadsæter et al. (2018), contrastingly, focused on patent boxes. The researchers reported that the impact of a patent box on an MNC's tax revenue depended on its provisions. Consequently, existing patents benefitted from low taxation of patent boxes in given instances, as was the case in the tax regimes of France, Ireland, the UK, Malta, Cyprus, Hungary, and Spain (Alstadsæter et al. 2018). Hence, these patent boxes represented a windfall gain to MNCs with existing patents in the sense that the firms' income after tax from existing patents in these jurisdictions rose without the need for further action. The study similarly reported that in some jurisdictions, regulations accommodated patents acquired from third parties. The results of Alstadsæter et al.'s (2018) study contained three primary variables of interests, including the effective tax rate, country, and time fixed effects. The researchers also included four control variables namely: IP protection, GDP level, business R&D, and real research activity (Alstadsæter et al. 2018). The results indicated that both real research activity and level of IP protection had large positive, significant correlations on location of patents. In other words, as real research activity increased and IP protection laws were tightened, companies were likely to locate their patents in these locations. The results of the study also indicated that the effective tax rate had contrasting results and it was sector dependent. Such was the case that this factor was negatively correlated in the auto and pharmaceutical industries; moreover, while a negative correlation was also reported between effective tax rate and patent location in the ICT sector, the researchers noted that the relationship was not statistically significant.

In a related study, researchers reported that geographic separation of the inventor's location and patent ownership was another notable trend in MNCs anti avoidance strategies (Baumann et al. 2018). Particularly, the researchers reported that the majority of patents that MNCs owned in low-tax countries were invented abroad, with the share of foreign-invented patents estimated at 78.52% in an average tax haven, while non-haven countries of high-tax jurisdictions only reported 6.45% of foreign-invented patents (Baumann et al. 2018, p. 9). This observation reflects the significance of taxation as a determinant for the legal location of patents**.** Similarly, the researchers reported a negative correlation between a country's income tax rate and the share of foreign-invented patents in that country (2018). In other words, as a country's income tax rate rose, the number of foreign-invented patents in that country dropped. Another notable finding by Baumann and others' study concerned the influence of international tax avoidance schemes on the earnings potential of a firm.

Table 1: Results of Studies

	Research question(s)	Key areas covered	Conclusion
Knoll B and Riedel N, 'Patent Shifting and Anti Avoidance Legislation' (2019) 17 *ifo DICE report*	1. Is patent-related income shifting in MNCs a quantitatively relevant phenomenon? 2. Should patent-related shifting in MNCs b controlled? 3. How can patent related shifting in MNCs be controlled	a. Patent ownership and profit shifting b. Patent box regimes and firm behavior c. Welfare consequences of patent box regimes d. Anti-avoidance measures	Empirical evidence on patent-related income shifting practices to low-tax countries suggests that the practices are a quantitatively relevant phenomenon. Secondly, anti-avoidance measures to combat income-shifting practices in MNCs through patents may appear to ineffective, but deduction limits and CFC-regimes bite and lower IP related shifting

Schatan R, 'Difficulties in Determining and Enforcing Source-Based Taxes' in Ruud de Mooij, Alexander Klemm and Victoria Perry (eds), *Corporate income taxes under pressure: Why reform is needed and how it could be designed* (International Monetary Fund 2021)	1. What are some of the challenges that jurisdictions face in the determination and enforcement of source-based taxes?	a. Risk analysis in transfer pricing b. The arm's length principle and the deconstruction of risk c. MNCs bias in determining profit margins d. Debt financing and profit shifting e. The problem of commercial rationality	MNCs overwhelmingly embrace the risk that arises from a firm's worldwide operations, while remaining indifferent to how such risk is allocated contractually among the group's subsidiaries, only acknowledging the effect of the risk on the firm's tax burden

		f. Restricting interest deductibility	
Hebous S, 'Has Tax Competition Become Less Harmful' in Ruud de Mooij, Alexander Klemm and Victoria Perry (eds), *Corporate income taxes under pressure: Why reform is needed and how it could be designed* (International Monetary Fund 2021)	1. What is the outcome of proscribing preferential tax regimes or insisting on the nexus approach? 2. Does BEPS Action 5 encourage an inefficient instrument, the intellectual property box regime, to incentivize R&D	a. Tax competition b. Internal initiatives on harmful tax practices c. Tax incentives in developing economies	In the future, low-tax jurisdictions that comply with international or regional taxation standards such as BEPS will make it increasingly hard and unattractive for MNCs to engage in patent-related profit shifting practice. However, these laws will incentivize shifting of real activities, which will consequently prompt strategic reactions that will come in the form of low corporation tax rates or introduction of such regimes elsewhere.

	activities and innovation and not cost-based tax incentives 3. What is the effect of profit shifting on tax competition? 4. In what ways can low-tax regimes make tax competition less harmful 5. What makes tax coordination increasingly challenging		

	6. What are some of the shortcomings of existing standards.		
Cédelle A, 'The EU Anti Avoidance Directive: A UK Perspective' (2016) 4 *British Tax Review* 490	What is the internal impact of the EU's ATAD directive on the internal markets of EU's member states, with a specific focus on the UK?	The legal consequences of ATAD in the UK on: a. Interest limitation rule b. Exit taxation c. GAARR d. CFC rules e. Hybrid mismatches f. Switchover clause	The EU's anti avoidance agenda and the BEPS process, with specific emphasis on adoption of ATAD principles have become mutually reinforcing; moreover, since the UK has been relatively receptive to anti avoidance policies, the ATAD directive simplified government initiatives regarding implementation of anti-avoidance measures.

Baumann M and others, 'Corporate Taxes, Patent Shifting and Anti-Avoidance Rules: Empirical Evidence' (*Social Science Research Network* 2018) <https://papers.ssrn.com/abstract=3186394>	How do MNCs lower their tax burden through strategic location of innovative output?	1. Geographic separation of inventor and patent ownership jurisdictions 2. Location choice strategies	Drawing in the universe of patent applications to the European Patent Office (EPO), evidence shows that MNCs actively engage in anti-avoidance strategies that involve relocation of patent income to low tax countries. Four major trends are observed, including the following: a. Distortion of patent location towards low-tax countries b. Patent location in low-tax countries is correlated with geographic separation of R&D output and input. c. MNEs systematically seek legal location of high-value

			patents in low tax countries, while low-value patents remain in high tax countries. d. The probability to legally locate patent ownership in a country with a low tax regime reduces if the CFC rules are enacted in the source country.
Alstadsæter A and others, 'Patent Boxes Design, Patents Location, and Local R&D' (2018) 33 *Economic Policy* 131	What are the determinants of patent registration across countries?	1. Patents 2. Patent boxes in Europe 3. Patent boxes and the link with local R&D	The researchers conclude that patent boxes have a notable effect on attracting patents, which is attributed to favorable tax treatment

Collier R and others, 'Dissecting the EU's Recent Anti Avoidance Measures: Merits and Problems' (ifo Institute - Leibniz Institute for Economic Research at the University of Munich 2018) EconPol Policy Reports 8 <https://econpapers.repec.org/paper/ceseconpr/_5f8.htm> accessed 7 March 2022	What are the merits and some of the challenges of the recent anti avoidance measures taken in the EU, including ATAP and Common Consolidated Corporate Tax Base (CCCTB).	1. ATAP 2. CCCTB 3. Causes and channels of profit shifting 4. Effectiveness of EU anti avoidance measures	The measures taken by the EU to curb MNCs' corporation tax avoidance have the potential to reduce profit-shifting loopholes; however, these laws also have several weaknesses, including the following: 1. The laws increase the complexity of the tax system together with the cost of compliance for firms 2. The regulations may potentially result in double taxation, with specific emphasis on GAARR, CFC, and the interest limitation rule.

			3. Many important details are left to EU member states 4. Some laws come with inadequate degrees of freedom
Griffith R, Miller H and O'Connell M, 'Ownership of Intellectual Property and Corporate Taxation' (2014) 112 *Journal of Public Economics* 12	How influential are corporate income taxes in determining in the selection of where firms opt to legally locate their intellectual property?	1. Firm behavior a. Payoffs b. Choice probabilities c. Location identification	Recent changes in taxation law that preferentially treat income arising from patents are highly likely to significant influence the location of intellectual property ownership.
Klemm A and Liu L, 'The Impact of Profit Shifting on Economic Activity and Tax' in Ruud de Mooij, Alexander Klemm and Victoria Perry (eds), *Corporate income taxes under pressure: Why reform is*	What are the major tax avoidance opportunities	1. Effects of profit shifting	In considering the connection between profit shifting and real investment, the study concludes that opportunities for profit-shifting lower

needed and how it could be designed (International Monetary Fund 2021)	that exist under the current international tax framework?	a. Effect on real investment b. Impact on government behavior c. Costs of transfer pricing d. Profit shifting with heterogeneous capital	the cost of capital in all countries, irrespective of whether they implement high or lower corporation tax rates compared to global averages. By reducing the global tax burden, MNE's profit-shifting practices reduce the cost of capital in all economies. However, whether the resulting effects are efficient remains to be known.
Hak M and Andrilic B, 'Challenges of Transfer of Intangible Assets in Digital Companies: Case Study of European Union' in Marijan Cingula,	Based on what is known about the digital economy, can an estimate be	1. Digital economy and e-business models	It is fairly easy to shift intangible assets from one jurisdiction to another;

Petar Misevic and Abdelhamid Nedzhad (eds), *64th International Scientific Conference on Economic and Social Development Development* (Leibniz Information Centre for Economics 2021) <https://www.zbw.eu/econis-archiv/bitstream/11159/5129/1/1747805807.pdf#page=113>	determined regarding the size of current e-business models, with the specific intent to curb profit-shifting due to the unknown value of the digital economy	2. E-Marketing 3. E-distribution 4. Effects of intangible assets transfer in digital enterprises	hence, without abuse-proof regulations, the nature of these assets creates an avenue for aggressive tax planning

6. Tax Avoidance Strategies Employed by MNCs: Key Findings From Qualitative Analysis of Secondary Data

MNCs are reported to employ various approaches in relocating their patent income at affiliates in low income jurisdictions (Baumann et al. 2018). Among these approaches is shifting entire R&D units to low-income countries. However, Baumann et al. (2018) found these approaches to be undesirable for a number of reasons. Among the demerits of whole R&D shifting was the associated high cost, since the majority of countries with low-tax regimes tend to be unattractive in other areas. For instance, these regions usually have poor infrastructure, and the available labor force usually lacks the required skills. The implication here is that if MNCs were to relocate their R&D activities in these locations, the companies would be forced to hire expatriates and invest in the infrastructure that is required to maintain high productivity. For this reason, some MNCs find it more profitable to retain their R&D activities at their headquarters in high tax economies (Baumann et al. 2018). However, the lack of required infrastructure and skilled labor does not always spell the end of the road for MNCs with ambitions to avoid paying high taxes.

While some low-tax jurisdictions may lack the required infrastructure and skilled labor, among other critical amenities, multinational firms may have a way around this problem. Particularly, Baumann et al. (2018) reported that MNCs opt to establish tax saving strategies in which they disentangle the location of patent-related income from the location of R&D units within their group. The most popular organizational approach that helps MNCs to achieve this end involves establishing an R&D office in a low-tax jurisdiction, which then subcontracts agreements with operating R&D units in other economies that charge high taxes. Under these agreements, the operating units in high tax jurisdictions are responsible for developing innovative ideas, and they are paid an

agreed fee for their efforts. More important, this fee is usually a fixed margin on their costs, and it is paid by the R&D unit in the low-tax jurisdiction. For this matter, since the R&D unit in the low-tax country bears the project risk, it not only owns the rights to the patents but also receives all residual profits linked to the patents (Baumann et al. 2018). Project risks associated with patents include the failure of the innovation to generate the anticipated income. In other cases, the new product might face challenges from regulatory authorities for one reason or another. Market rejection is also a possibility. There is another third approach that MNCs may still employ.

The third approach towards shifting earnings to a low-tax jurisdiction involves patent ownership and patent related income. To relocate patent ownership and patent-related income to this favorable low-tax jurisdiction, Baumann et al. (2018) report that MNCs come up with favorable cost sharing agreements. In this strategy, like is the case with the previously discussed approach involving operating R&D units, the location of the patent inventor and the patent applicant are separated geographically. Consequently, operational complexities arising from this situation are resolved gradually.

While the above findings illustrate the specific strategies that MNCs employ to forego incurring high fees in corporation taxes, some researchers have gone further than merely describing the tactics of multinational firms. A case in point is Knoll and Riedel (2019), who analyzed both patent box regimes and company behavior. The researchers reported that existing patent boxes exhibit notable variations in their design and advantages; however, three features appear across many low-tax jurisdictions, including the existence of a development condition, the covered IP, and the tax-reduction that the country grants (Knoll and Riedel 2019). According to Knoll and Riedel (2019),

patent boxes have an influential role in decisions regarding location of patents, particularly when it comes to high value patents. The researchers add that patent location tends to be increasingly sensitive to the tax advantages offered by patent boxes; hence, if a patent box comprises a large scope of covered IP, they are likely to attract many MNCs with an intention to relocate their patents. Knoll and Riedel (2019) also reiterate the findings by Baumann et al. (2018), noting that patent boxes attract patents rather than actual R&D activities. In other words, like was the case in Baumann and others, in which MNCs for instance established an operating R&D unit in a low tax country, which owned the patents invented by an R&D unit at the headquarters in a high-tax jurisdiction, Knoll and Riedel (2019) observed that MNCs locate their R&D activities and patents in different locations. This indicates some financial related tactics.

6.1. Location of Patents and R&D on MNCs Bottom Line

Evidence from studies revealed that the location of R&D and patents is not always the same (Baumann et al. 2018; Knoll and Riedel 2019). However, the question on which the study focused concerned how location of patents and R&D impacted MNCs bottom lines. Various researchers provided some notable contributions to this end. Griffith Miller and O'Connell (2014) modelled the impact of tax on where firms opted to locate ownership and income from patents. The researchers reported that the degree to which firms structured their business in a way that income can reasonably be believed to be generated by a subsidiary usually varied from one MNC to another; hence, while some firms exhibited increasingly aggressive behavior, conversely, other MNCs only pursued such avoidance in moderation. More important, the researchers reported that some firms opted to forego income-shifting through patent relocation, and, instead, these companies chose to retain both the location of their R&D and patents at their headquarters, as the resident jurisdiction

had the required high-skilled labor and infrastructure to supportive real innovative activities (Griffith et al. 2014). However, the researchers reported that the majority of firms often opted to locate their patents in jurisdictions that allowed them to maximize their income. The researchers then proceeded to analyze the factors that affected the cost and benefits of a selected jurisdiction.

Many factors were found to affect the costs and benefits of a relocation decision. More important, the researchers noted that the cost of relocating R&D and patent activity to a tax haven may be high. The increase in cost was attributed to binding CFC rules, difficulties in relocating R&D and patents to locations with little or no activity, and the misalignment of tax havens with non-tax dimensions, including intellectual property rights protection (Griffith et al. 2014). Yet, despite these demerits, some companies highly prioritize relocation of patents, and, in some cases, R&D activities, with the intention to earn income in a location that is different from the legal ownership of the patent. Firms were reported to consider tax when making location decisions, as, in many instances, companies were faced with tax costs associated with transfer of ownership of intangible assets (Griffith et al. 2014). More important, for firms to generate a tax benefit from a decision to transfer the location and ownership of a given patent or intangible asset, the costs associated with the process must be below the true market value. The researchers also highlighted other factors with the potential to impact a firm's bottom line.

These factors concerned established laws or regulations in the home country. Particularly, the researchers reported that the transfer of location and ownership of intangible assets of an MNC is subject to transfer pricing rules. More important, these rules may limit the value that can be legally transferred to a low-tax jurisdiction (Griffith et al. 2014). At the same time, many jurisdictions

have also implemented exit taxes, which levy tax on the net present value (NPV) of the predicted revenue stream on a patent, when the intangible is relocated to another jurisdiction (Griffith et al. 2014). These provisions have a reductive effect on the tax benefit that MNCs may enjoy from relocation of patents and related intangible assets. Researchers also measure the effect of taxes on payoffs. For instance, in their study, Griffith, Miller, and O'Connell (2014) assumed that returns from patents were high to the extent that related deductions, including capital allowances were offset, meaning that MNCs only faced statutory tax rates. However, the researchers noted that CFC rules, which are implemented as a prevention measure against relocation of income to low-tax countries by MNCs to avoid taxation at home may reduce the tax advantage of firms further. CFC rules usually deem the income received from a patent to be passive earnings, and the share of such passive income is sufficient to trigger CFC rules.

Other researchers have analyzed the impact of MNC's location of R&D and patents on the firms' bottom lines by looking at the investment effect of profit shifting costs (Klemm and Liu 2019). Among the costs that the researchers have analyzed are transfer pricing costs. More important, after examination of the impact of government introduction of strict transfer pricing rules in Europe, Klem and Liu (2019) reported that the regulations were negatively correlated with MNC investment in fixed assets. The researchers also analyzed the impact of thin capitalization rules, highlighting a negative correlation between thin capitalization and both employment and investment (Klemm and Liu 2019). The results of the study also indicated that the negative investment effect on thin capitalization rules rose in highly leveraged subsidiaries and with tighter safe-haven

ratios. The last regulation that researchers have examined concerns CFC rules. Using data on German and US firms, researchers reported that these rules decreased subsidiaries real investments by an average of 7 million euros per subsidiary in German companies and by 12 percent in US firms.

7. Discussion and Conclusion

Growing evidence from literature and the news media indicates that MNCs have resorted to shifting profits from high- to low-tax jurisdictions, with the aim of lowering their overall corporate tax obligation. Various approaches are employed by these firms to achieve this end, and they include distortion of intra-firm transfer prices and debt equity structure changing of the location of highly valued intangible assets, including patents to low-tax subsidiaries. This established trend is usually targeted for policy changes regarding corporation tax by high-tax jurisdictions, as it is deemed detrimental because it contributes significantly to considerable loss of tax revenue. For instance, in one study, using evidence from Germany, researchers reported that the country would have increased its corporate income tax earnings by 14% if German MNCs were not engaged in income-shifting practices (Huizinga and Laeven 2008). This study confirmed that companies had the motive to engage either aggressively or moderately in income-shifting activities through patent ownership relocation from high-tax regimes to low tax jurisdictions.

Among the objectives of the study was to find out how anti avoidance laws affected profitability of MNCs in different tax regimes, including high tax and low tax regimes. The results of the study indicated that MNCs were continuously faced with the decision of where to locate each of their patents, and these companies made their decisions based on the tax that they were expected to pay on income generated using the patents. The results also indicated that the impact of a patent box on an MNC's tax revenue depended on its provisions. Consequently, existing patents benefitted from low taxation of patent boxes in given instances. At the same time, evidence revealed that due to the undesirability of high-tax regimes, the majority of patents that MNCs owned in low-tax countries were invented abroad, with the share of foreign-invented patents estimated at 78.52% in

an average tax haven, while non-haven countries of high-tax jurisdictions only reported 6.45% of foreign-invented patents.

From the three selected countries that were presented earlier, the impact of their respective tax regimes on MNCs profitability is variable. For instance, for the case of South Africa, the country was reported to embrace a binary system. Since patent relocation largely involves transfer pricing, South African law provides that "the taxable income or tax payable by the person deriving the tax benefit to be calculated as if the transaction had been entered into on arm's-length terms and conditions"(Dachs and Snyckers 2019, p. 185).[19]

Similarly, with effect from April 2012, South African regulations concerning thin capitalization deal with the issue based on the arm's length principle under general transfer pricing rules (Dachs and Snyckers 2019). Conversely, in the United States GOP-sponsored TCJA of 2017 is the more applicable law. TCJA was a reactionary law that sought to resolve some of the problems that the government faced, when seeking to tax intangible assets, including patents. Particularly, the TCJA approached this problem on two fronts. The first approach, which was dubbed the carrot, involved FDII, while the second approach, which was dubbed the stick, involved GILTI (Schwartz and Edgar 2019). More important, GILTI increases MNCs profits, as it reduces corporations tax obligation by 50%, which will fall to 37.5% after December 2025. At the same time, the implication of this provision is that corporations are taxed GILTI at the rate of 10.5% and the rate would apply for all taxable years prior to 2025, after which the rate would rise to 13.125%. The FDII is applied

[19] Moreover, the law provides that where there is a difference between the actual terms and conditions and the arm's-length terms and conditions applied in the calculation of a South African resident company's taxable income, that the amount of such difference be deemed to be a dividend consisting of a distribution of an asset in specie to the foreign party (Dachs & Snyckers 2019, p.185).

in addition to the GILTI, whereby, under Section 250 of the Code, MNCs qualify for a 37.5% deduction in respect of FDII; however, the rate is scheduled to drop to 21.875% beginning 31st December, 2025 (Schwartz and Edgar 2019, p. 267).

However, compared to the two models above, the Irish tax system is the most appealing. Among the standout features of the Irish tax regime is the 12.5% corporation tax charged on trading income (Quinn and Burke 2019, p. 76). Moreover, the Irish tax regime comprises other elements, including a tax-exempt regulated funds regime, broadly defined tax exemptions, a network in the excess of 74 double tax treaties, and participation exemption for gains on shares that increase its general attractiveness to MNCs patent relocation activities (Quinn and Burke 2019). The rational expectation is that high taxes are bad for a country. Particularly, economists argue that exorbitant corporate taxes reduce a country's capital, while increasing the capital deployed in another or other countries (Hebous 2021). According to Hebous (2021), conventionally, when taxes are set strategically to generate an equilibrium in all countries, the move would benefit from an increase in all tax rates. However, while under-taxation is desirable, the policy has the negative impact of resulting in under provision of public goods. Keen and Konrad (2013) have ascertained this fact in their theory of international tax competition and coordination. Hebous (2021) explains that another effect of under-taxation or lower corporate income tax rate is that it exerts downward pressure on the top personal income tax rate as the tax regime struggles to avoid disparities between the taxation of corporations and other legal forms of businesses. Yet, despite the negative economic view of low tax regimes, the case of Ireland and the move by other countries to introduce tax havens illustrates that low taxation is a viable model.

Owing to the confounding effect of tax havens noted above, some researchers have sought to understand how these tax regimes can be integrated into the global system smoothly. Particularly, Keen (2001) sought to find out how preferential tax regimes can operate with minimal harmful effects on other countries. The researcher illustrated that preferential tax regimes, which policies tend to single out for criticism, are, to the contrary, socially desirable, making tax competition not more but less harmful than it would otherwise be (Keen 2001, p. 758).[20] The implication here is that proscription of preferential tax regimes may be counterproductive. The question that remains concerns how preferential tax regimes benefit revenues and welfare. Hebous provides somewhat of an answer, citing the different degrees of mobility of tax bases. Particularly, Hebous notes that in the presence of a preferential tax regime, inter-country competition is usually concentrated and intense over the mobile base, which means that respective countries miss revenues from the tax base in question. However, one needs to note that the immobile base continues to be taxed at a higher rate. More important, abandoning the preferential tax regime limits the competition entirely to employing the corporate income tax rate, resulting in lower tax revenues from the immobile base (Hebous 2020). Overall, while tax havens might be targeted by policies such as the OECD's BEPS, preferential tax regimes are not always deleterious, as they are linked to improved tax revenue and welfare.

MNCs may approach tax avoidance through patent relocation in several ways. These firms may choose to shift entire R&D units to low-income countries. Alternatively, MNCs may opt to establish tax saving strategies in which they disentangle the location of patent-related income from the

[20] Keens study argued that proscribing preferential regimes are counterproductive. However, the study was not based on the notion that the downward pressure on tax revenue from tax competition was in itself desirable as a check on wasteful governments (Keen 2001, p. 758).

location of R&D units within their group. The most popular organizational approach that helps MNCs to achieve this end involves establishing an R&D office in a low-tax jurisdiction, which then subcontracts agreements with operating R&D units in other economies that charge high taxes. Lastly, MNCs may opt to relocate both patent ownership and patent-related income to a favorable low-tax jurisdiction. The Irish tax regime has several elements that make it more attractive for MNCs compared to South Africa and the United States. In Ireland, concerning tax income from a subsidiary, an MNC located on Irish territory is subject to Irish tax on trading income that is generated from the MNC's branch, the subsidiary's property or rights, or assets held by the local branch and other gains on specified assets(Quinn and Burke 2019, p. 76). Two elements, including provisions regarding knowledge development boxes and provision or acquisition of intangible assets, stand out when it comes to the Irish tax regime. Concerning the former, Irish law provides that, the sum a firm incurs in the course of the development, creation, or improvement of qualifying patents or computer software, which is collectively referred to as the qualifying expenditure, is divided by the overall expenditure on the venture, and this sum may include net sales and royalties. More important, firms qualify for a tax credit that is calculated at the rate of 6.25% of the qualifying expenditure. With the latter, conversely, companies qualify for capital allowances for capital expenditures on intangible assets, including IP assets, which are needed to conduct trade.[21]

The leeway that MNCs have in engaging in aggressive tax planning, which may see them relocate their patents to another jurisdiction is attributed to the problem of commercial rationality. Schatan (2021), who contends that MNCs frequently engage in controlled transactions that have no market parallels, describes this phenomenon (Schatan 2021). Commercial rationality is a situation where

[21] However, the relief applies to more than just patents, as other IPs, including copyright, know-how, and trademarks, qualify for relief (Quinn and Burke 2019, p. 79).

business entities choose strategic decisions that make sense financial-wise to their own welfare**.** Yet, the Arms lengths principle provides that when parties that are related are involved in a transaction, the resulting actions should proceed as if the two were not related; hence, the transactions should be subject to market pricing (Brauner 2008). The question that arises concerns whether it is reasonable for MNCs to adjust the conditions of the transactions found in the market to reflect those contracted by related parties (Schatan 2021). Schattan concludes that the business context of the agents, including a parent company and a CFC, engaged in such transactions avoid mimicking market conditions in these transactions. A case in point is when an affiliate loans an amount to a related party that no other party would provide because of solvency issue.[22] These cases usually involve asymmetry of information, in which an affiliate has better information or can rely on an implied guarantee, which is the case since the transaction is synonymous to lending to oneself. In arguing against such transactions, one must ascertain whether a transaction that is unique to a multinational enterprise generates commercial rationality that transcends tax planning. MNCs have so far enjoyed a windfall, which is attributed to the challenges that tax authorities experience when attempting to prove this fact and due to the subjective nature of the exercise.

7.1. Conclusion

This study confirms that while anti avoidance has a limiting effect on MNCs ability to retain more of their earnings, these corporations either aggressively or moderately engages in tax avoidance through patent and R&D relocation. These firms may choose to shift entire R&D units to low-

[22] an affiliate may loan an amount to a related party that no independent would lend to a client because of solvency issues. Legitimately, it could be a case of asymmetry of information where the affiliate has better information or can rely on an implicit guarantee (lending to itself)" (Schatan 2021, p. 74).

income countries or may opt to establish tax saving strategies in which they disentangle the location of patent-related income from the location of R&D units within their group. The most popular organizational approach that helps MNCs to achieve this end involves establishing an R&D office in a low-tax jurisdiction, which then subcontracts agreements with operating R&D units in other economies that charge high taxes. Anti-avoidance, including exit taxes and foreign-source income tax, among others may have a limiting effect on R&D and patent relocation activities among MNCs, compelling these firms to retain their patents in their home countries. However, the decision to retain R&D and patent ownership at the headquarters of an MNC is motivated by more than mere restrictive tax regimes. Such is the case since MNCs were found to be increasingly likely to retain ownership of patents and R&D activities in a high-income tax jurisdiction if the jurisdiction provided state of the art infrastructure and the required skill level in the labour force.

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