Brazil’s Experience with Unilaterally Taxing the Tech Industry versus International Digital Taxation

This article discusses Brazil’s approach to taxing the tech industry and how its transfer pricing and international tax policies on the taxation of business profits provide different perspectives on digital service taxation.

1. Introduction

In the early 1990s, the Brazilian economy was unbalanced due to uncontrolled public expenditure. The government used hyperinflation as a monetary policy to control expenditure. The end of hyperinflation and the stabilization of the economy in 1994 meant that Brazil required an alternative solution to its financial problems. As expenditure had to finance the newly born welfare state of Brazil, foreign direct investment was chosen as a means of covering the needs of the government. Brazil presented unique opportunities in hard and soft infrastructure, as well as a huge consumer market. The country was quite successful in attracting a high volume of greenfield and brownfield investments that brought about massive inflows of technology.

However, the waves of intangible investments were followed by important outflows of industrial property and software (copyright) royalties, as well as service fees to the OECD region. The increase in outflows had a negative impact on the make-up of the current account and the balance of payments with regards to imports of capital. This scenario sounded the alarm for tax authorities and required Brazil to review its tax system and find ways to effectively tax the repatriation of items of income associated with intellectual property and capital to avoid evasion. It became clear that a solid BEPS policy would be crucial to the success of Brazil.

The experience forced Brazil to design a tax policy capable of minimizing the risk of loss of taxable income associated with intangible assets. By adopting a mix of profit and turnover taxes on outbound payments of royalty and service fees, Brazilian cross-border taxes already target and are heavily levied on a good part of the digital income paid to non-residents. This strategy, born in the late 1990s and early 2000s, has allowed the tax authorities to be in a better position to deal with the digital economy and prevent tax evasion at a moment when most jurisdictions are looking for solutions that involve a digital services tax (DST).

The overall analysis proposes to explain how Brazil’s formulaire transfer pricing policy – enacted in 1997 and combined with high cross-border taxation as a form of additional transfer pricing adjustment – minimized the flaws of the OECD arm’s length principle and eliminated the problem of the OECD permanent establishment (PE) rule to improve international equity.

2. The Current System

The principles for solving conflicting claims between jurisdictions and establishing income apportionment through transfer pricing rely on the PE rule of article 7 of the OECD Model, which deals with business profits. For OECD exporters of capital, the PE rule addressed the taxation of business profits properly in relation to the 20th century industrial economy, in which PEs were commonplace; however, PEs have become irrelevant for the business model of the 21st century digital economy. How does this work?

The residence state has primary jurisdiction to tax the passive income of its investors in foreign jurisdictions. The OECD Model recognizes that source states may first levy withholding taxes on the gross amount of outbound payments to the residence state. The shared taxation serves as recognition that there is an economic nexus between the land and the source of production of that income. If both states tax passive income, there will be double taxation. The residence state where the investor resides may exempt the return of the foreign source investments from income taxation or grant a foreign tax credit with respect to the foreign tax paid to the source country.

The analysis changes for active income. The primary taxing jurisdiction is exercisable by the country from which that income is sourced, based on the relationship of the income with the taxing state. Source taxation is related to the economic opportunity that allows the taxpayer to derive income from its territorial boundaries through income-generating assets and active business activities.

The OECD Model acknowledges that an active business operation is carried out in a source state if the non-resident...
investor has a PE where the business profit originates. The source state has the primary right to tax the profits attributable to its PE and subject them to corporate income taxation on a net basis. If the business profit is unrelated to the PE, it is exempt from source taxation and subject to corporate income taxation in the residence state.

The rules above derive from a global institutional arrangement born in the 20th century that is applicable to the goods and services of the old economy. The old arrangement is based on rules and principles created during the second industrial revolution. It created a functional system in an industrial manufacturing economy and allowed for the expansion of OECD multinationals. These multinationals have been highly dispersed internationally through sets of industrial plants, where activities were geared toward the needs of globally integrated supply chains.

This decentralization resulted from the introduction of technologies and the possibility of geographically segregating low-wage standard procedures from highly skilled tasks – a key process that led to tax strategies like the migration of intellectual property from high-tax jurisdictions to “European tax havens” and new transfer pricing techniques. The production of subsidiaries would feed the markets of the countries providing the investment capital.

However, the 21st century was a decisive turning point for what is now called the “digital economy”, a ground-breaking transformation of factors of production. The old rules are no longer applicable to current global trade, a new market of sophisticated intangible solutions sold under a different business model in view of the evolution of technologies.

The digital economy is a broad concept. It started with the growth of telecommunications, the rise of tech and knowledge-intensive industries and the streaming of business on a global scale. These events brought about disruptive modifications of the means by which multinationals do business and a significant change in the composition of cross-border transactions. This new economy is based on a wide range of information, communications and technology solutions, sales of industrial services, hardware embedded with intellectual property, software licences, Internet services, entertainment, high value-added information and technology services, including cloud solutions, and specialized human capital. Perhaps the decentralization of economic activity seen in the 20th century may be reversed, meaning that an important economic consequence may be expected in the long run.

In the 21st century, countless sales of digital solutions are replacing the sales of tangibles in terms of volume. The digital sales translate into direct sales from residence states to consumer markets in source states in exchange for business profits. Companies of the digital economy require no physical presence in the source countries to perform sales. The point now is that OECD members have assumed the position of source countries that cannot tax the business profits of US tech players because there are neither PEs nor active income. Needless to say, according to the OECD Model’s primer, business profits can only be subject to income taxation in the residence country, save for the presence of a PE in the source state, in which case active profits could be subject to income taxation on a net basis.

The inconvenience for those OECD members is that tech companies either have no PEs for the attribution of business profits or could go around the rule, preventing source taxation by invoking either domestic sourcing rules or bilateral tax treaties. The tech industry’s business model implies no greenfield or research and development investments, no plants, no creation of a relevant labour force and no creation of value in the source state. Tech companies basically export solutions to consumer markets, eventually establishing cost-plus subsidiaries with small commercial structures (namely with just a marketing and sales team and a limited helpdesk, as complex matters run through helpdesks located away from high-tax jurisdictions).

If the residence state is where the industrial intellectual property (design, development and engineering work) associated with the sale of products and services is located and where the value of such products and services is created, source countries cannot attribute taxable income to PEs. However, some OECD member countries claim that non-residents benefit from the user basis of the source country, and that is a substantial economic nexus for source taxation.

These OECD member countries decided to raise economic reasons to shift the international tax debate from where companies create the value of the products and services (residence state) to where companies obtain that same value, e.g. in the domestic market of the source state through the user basis.

The digital economy exposed crucial gaps in the international tax and transfer pricing rules. Withholding taxation seems to be the only solution for source countries, while OECD member countries have also started to question whether the arm’s length principle of articles 7(2), 7(3) and 9 of the OECD Model is still an acceptable method for the proper allocation of business profits accruing to a business operation in two or more jurisdictions.

Rather than eliminating double taxation, 21st-century policymakers focus on double non-taxation by virtue of tax strategies and the use of harmful tax competition techniques, as well as the impossibility of source states taxing business profits from digital sales.

In sum, the OECD member countries argue that international tax and transfer pricing rules fail to address the economic impact of the digital economy and have appealed for international coordination and a new institutional arrangement on the grounds that the tech industry, notably the US tech industry, causes economic distort-


3. A physical place of business or an agent with powers to bind the non-resident to contracts on a habitual basis in the source state.
tions, benefits from the value of their consumer markets and imposes losses on them, as source states that do not have the tools to tax their income.  

These countries have put pressure on the G20 for a review of the outdated 20th-century global institutional tax arrangement that facilitates international trade. In 2013, the G20 mandated the OECD to start the BEPS Project. The BEPS Project had the intention of producing recommendations to tackle evasion and double non-taxation. The review comprises a hodgepodge of key rules that form the pillars of the international tax and transfer pricing system, namely articles 5 (PEs), 7 (Business Profits) and 9 (Associated Enterprises) of the OECD Model. The main questions are (i) whether the PE concept could be expanded to conciliate residence and source principles; (ii) whether the arm’s length principle would suffice to ensure international equity; (iii) how article 7 could prevent tech companies from imposing losses on source countries; and (iv) how the OECD could prevent full residence taxation of digital business profits.

As countries absorb the losses imposed by the tech industry, they seek to implement unilateral tax policies by approving DST laws until a global consensus is reached. The proposed DST solution is punitive and retaliatory. Whether DST should be a profit or turnover tax and whether its nature does not conflict with the OECD Model remain to be determined. If its legal nature is that of an income tax, the levy of a DST would conflict with article 7 of the OECD Model (Business Profits). If an indirect tax, the cost of DST should increase the final price of solutions. The unilateral solution is inefficient and increases the cost of doing business while countries fight for their fair share of the global taxable income.

It is also compelling that OECD member countries have always agreed with the OECD Model’s policy, namely the PE rule and residence-based taxation for business profits, but now that there is an economic imbalance with the US in particular, they propose a new game plan to impose source taxation. The contradiction is that, according to the primer of the OECD Model, residence-based taxation is preferred because the residence country is in the best position to assess the costs associated with the exports of intellectual capital and, hence, impose its own corporate income taxation.

3. Brazil’s Policy

Differently from some OECD member countries’ economies, Brazil’s position has always been in favour of the concept of a user basis for the digital and non-digital economy based on the importance of the domestic market. It also maintains this position regarding tax treaty partners in respect of which Brazil is a net exporter of capital. While some may say that this is Brazil’s unilateral approach to the taxing rights and income allocation applicable to the tech industry, this is not the case. Brazil’s tax treaty policy is negotiated with its trade partners, and the implementation of its views depend on their formal agreement. By comparison, the enactment of DST lacks bilateral consensus and seems to lack a legal basis concerning tax treaties.

In the 1990s, the volume of funds injected into the Brazilian economy through foreign direct investments and domestic investments was unprecedented. Inflows of capital, assets and intangibles were channelled to projects intended to renew physical infrastructure and the manufacturing industry, as well as into mergers and acquisitions. Within that decade, there was also an increase in investments in the tech and service industries.

The flows were heavily associated with transfers of technology, know-how and the rendering of high-value-added services and specialized human capital. The movement was followed by outflows of industrial property royalties, software royalties, technical assistance and service fees. The intercompany outflows associated with intangible items raised a red flag. There were significant volumes of repatriation connected with industrial projects and software licences. The 1990s was a turning point for the assessment of the impact of cross-border transactions involving intellectual property and capital.

While Brazil was in the process of opening its economy, the tax authorities not only sensed that the tax system lacked the appropriate framework to curb potential tax evasion and price manipulation, but also identified further challenges. Brazil’s trade flows were in the hands of integrated multinationals that were part of global supply chains with experience in transfer pricing and cross-border tax planning. Furthermore, article 7 of the OECD Model shifted important chunks of tax revenue to residence states, so tax treaty policy and domestic sourcing rules required coordination to prevent that from happening.

The Brazilian tax authorities also kept an eye on the initial OECD debates about the impact of the digital economy on the tax revenues of countries in the late 1990s and early 2000s. The OECD working groups concluded that payments of business profits associated with the tech industry, such as services of high value (e.g. intellectual services, banking and financial transactions, transfers of software), the provision of information, data processing, telecommunications services and broadcasting) should remain...
tax-exempt in the source country and fully taxable in the residence country. They also argued that proceeds from the sales of software physically transmitted on compact disks and hard drives or electronically transmitted via download should be subject to low taxation or no taxation in the source country.

3.1. Sketching tax and transfer pricing policies

The context of Brazil decades ago led the tax authorities to anticipate the BEPS discussion and adopt alternatives for taxing business profits and royalties. Brazil disagreed with the contents of the PE rule in articles 5 and 7(1) of the OECD Model, as well as the arm’s length principle in articles 7(2), 7(3) and 9 (Associated Enterprises). The provisions limited the country’s power to tax returns on investment. The PE rule prevented Brazilian source taxation on legitimate taxable income from its domestic market, while the OECD’s methods based on the arm’s length methods often created undue apportionment of taxable income. Brazil’s viewpoint challenged established ideas of how countries should assign jurisdictional taxing rights and quantify gains to be allocated for transfer pricing assessment.

Brazil identified flaws in the tax policy behind article 7 of the OECD Model that allowed non-resident companies to circumvent the PE rule. The idea of international economic justice in the OECD Model did not appear sound to local tax authorities. Their response to this has been to make outbound payments from Brazilian sources of income subject to withholding taxation, even if payments have not gone through the domestic financial system.

The fact that outbound payments had no connection with a PE in Brazil could not deny Brazil’s right to tax them. The country where the economic activity was conducted or consumed by its market or user basis would serve to support source taxation. Further, the need for a detailed definition of a PE rule in domestic legislation would become unnecessary if Brazil were to tax any outflow, including business profits. Non-residents had to cede to Brazil’s jurisdiction if they intended to operate there.

With regard to income allocation, the technical explanation of the 1997 federal legislation on transfer pricing indicated that the arm’s length principle required adjustments in order to be effective. The choice for rules based on formulaic methods, fixed gross margins and markups and safe harbours led to questions about whether the methods were actually arm’s length or merely other ways of achieving the goals of the arm’s length principle. This is a matter of interpretation. A deeper analysis of the history of transfer pricing in Europe and North America in the first half of the 20th century and of the discussion on the construction of the current article 9 of the OECD Model (Associated Enterprises) shows that this provision may include different angles regarding the implementation of the arm’s length principle.

Brazil’s tax policy in the 1990s followed a path that sharply moved away from the OECD with respect to (i) high cross-border direct and indirect taxation of items of income associated with intangibles; (ii) taxation on both sides of the intercompany transaction by looking at the integrated business of the multinational; (iii) the implementation of a solid position on sourcing rules against the primary rights of residence taxation; and (iv) the adoption of formulary transfer pricing regulations. Brazil’s view indicated that the goal was to mitigate BEPS caused by multinationals and OECD member countries.

Its different take on how to achieve international equity appears to have given Brazil a better starting position to impose its tax collection on non-resident tech companies from treaty and non-treaty countries. In the event of double taxation, the residence state should provide a solution to its taxpayer, such as granting a tax credit to minimize the impact of the source taxation.

3.2. Business profits and the PE rule

The tax treaty policy of Brazil goes beyond the economic aspect. The content of a bilateral tax treaty must be politically acceptable and socially beneficial for both sides.

Article 7 of the OECD Model is the starting point for the discussion of Brazil’s tax treaty policy with respect to its impact on the tech industry and other sectors. Article 7 does not define the terms “business” and “profits”. Article 32 of the OECD Model states that undefined terms have meaning in the domestic legislation of the country applying the treaty. Under Brazil’s domestic tax legislation, business profits qualify as the operating profits of companies, which includes gross revenues from services.

While OECD member countries argue that the residence country is in the position to confirm whether the rendering of services will be profitable upon the calculation of gross revenues against costs and associated expenses (one may argue that the marginal costs of these transactions may be equal or close to the marginal revenue), that is only one view from a legal standpoint.

Brazil’s tax treaty policy relies on a negotiation strategy to legally circumvent the PE rule of article 7 of the OECD Model. The tax authorities have historically negotiated that profits from technical and administrative services and the like should be treated as royalties under article 12 of the OECD Model, agreeing with the other state to expressly classify services of any nature that would normally fall under article 7 as instead falling under article 12, granting Brazil the right to tax. Brazil’s case law fully supports the position of the tax authorities in favour of taxing service profits as royalties.

The cap on source taxation negotiated in Brazilian tax treaties is equivalent to the domestic rate. In this way, tax treaties have no impact on the reduction or elimination of withholding taxation. For tech companies from treaty

---

7. Services of low value could be subject to source taxation.
8. Source countries should tax the physical media through duties, but the payments for the use of the intellectual property should be tax exempt.
countries. This means that business profits from Brazil will be subject to withholding taxation.

3.3. Additional cross-border taxation

The Brazilian policy on the cross-border taxation of items of income associated with intangibles is based on the idea that the multinational group is an integrated business. There is no distinction between non-resident and resident related parties when it comes to the taxation of royalties and services; both bear the tax impact. The resident taxpayer is responsible for the collection of its own taxes and those imposed on the non-resident. The total tax burden is in the ballpark of 40% (50% if the recipient is in a listed tax haven), whereas about 50% of the burden is on the non-resident.

The taxes levied on the non-resident are twofold, corresponding to a top maximum combined marginal rate of 20%. The tax burden on service and royalty fees in the tech industry includes the federal withholding tax and a city tax on the gross amount of the service (and royalty) fees paid to non-residents.

The residence state must consider whether the city tax is a turnover or profit tax if the idea is to request a foreign tax credit in the home country. Brazil's tax treaties do not cover city taxes.

The tax authorities also impose three federal taxes of an indirect nature on the resident payer of business profits. The taxable events regard (i) credit or payment of fees due for imported services and technology; and (ii) currency conversion for wire transfers. These transactional costs allocated to the Brazilian payer correspond to a total rate of 20%.

The total taxation is fairly equal to what a Brazilian PE would collect. The tech industry, when dealing with Brazilian corporate taxpayers, cannot circumvent this taxation. Another aspect of this policy applicable to the tech industry is that high cross-border taxation and the fact that tax treaties provide no shelter expresses a forced transfer pricing adjustment that reinforces Brazil's formulary transfer pricing methodology.

The combination of high cross-border taxation and the negotiation of tax treaties make the PE rule inapplicable, and formulary transfer pricing and arbitrary limits on deduction and remittance for industrial property royalties (see next item, section 3.4.) represent a framework intended to allocate more taxable income to Brazil. This policy denies undue tax exemptions, undue income allocation and undue corresponding transfer pricing adjustments in favour of residence states.

In conclusion, the different taxes Brazil imposes on payments to any non-resident company represent a tax burden that is greater than a standard DST. Recently, a congressman presented a very brief DST law project to Congress. This has been seen as an isolated and unilateral decision disconnected from the Brazilian tax policy. It has not attracted the attention of congressmen, nor other relevant authorities. The proposal was never discussed with the federal government. Congress, Federal Revenue, nor was it discussed with the business and academic communities. The pressing concern of the country is the discussion and approval of a tax reform that will introduce a federal VAT and reduce the corporate income tax.

3.4. Transfer pricing

Articles 7(2) and 7(3) of the OECD Model provide for the methods of apportioning profits derived by PEs operating in different jurisdictions. Article 9 allows the tax authorities of a country to rewrite the accounts of an associated enterprise to show the true profits arising within that country. In both instances, the solution is based on the arm's length principle.

The theory assumes that the members of a multinational group act as if they are not related to each other. It is assumed that members of a multinational compete with each other as if they were independent parties each attempting to maximize its own profits. That is not the case in the view of the Brazilian tax authorities: multinationals are integrated businesses, and the different units do not compete. The OECD Transfer Pricing Guidelines clarify that the price agreed upon by related parties for a particular item should equate to that which unrelated parties would have negotiated for the same or a similar one, under the same conditions and circumstances. This approach does not seem realistic with respect to high-value-added services and royalties paid from source countries.

Under a formulary apportionment system or the like, the authority to tax the income is allocated to a different country based on formulae. Brazil introduced formulae and arithmetical elements into the OECD's traditional methods with a similar goal, namely the elimination of the upper hand of multinationals in the potential manipulation of intercompany prices associated with intangibles.

What does Brazil achieve by implementing this kind of policy, which deviates from the international practice adopted by OECD and non-OECD member countries? Brazil’s tax authorities appear to have the aim of ensuring the competence to tax and apportion tax revenue based on international equity, and may enforce another view of the competence to tax and apportion tax revenue based on international equity, and may enforce another view of the possibility of multinationals to rewrite the accounts of an associated enterprise to show the true profits arising within that country. In both instances, the solution is based on the arm's length principle.

Brazil’s transfer pricing policy for intangibles has one clear concern: the respective repatriation of the following items:

1. Service fees of high value, e.g. intellectual services, the provision of information, data processing, telecommunication services and digital broadcasting;
2. Customized software copyright fees and acquisitions of clickwrap software (and shrink-wrap software as well, but these imports are residual in the market); and
3.5. Transfer pricing policy for the tech industry

Brazil enacted its transfer pricing legislation in 1997. The tax authorities concluded that the OECD arm’s length principle and methods would not fulfill the needs of Brazil with regards to addressing evasion and pricing manipulation. Brazil chose to adjust the OECD methods and turn them into objective tools through the adoption of formulæ.

Brazil chose a formulary approach combined with fixed margins. The information needed for the analysis and adoption of formulæ comes from the accounting records of the Brazilian company. The methods impose minimum levels of taxable income for exports and maximum levels of deductions for imports based on a low-cost system supported by objective methodology. The adoption of formula and statutory fixed margins eliminated the need for comparability and functional analyses.

The Brazilian import methods applicable to intellectual property and capital are limited to the traditional transaction-based OECD methods, namely the comparable uncontrolled price (CUP) method, the resale price method (RPM) and the cost-plus method (CPM). Taxpayers have to select one of three methods to determine the appropriate transfer price. On intercompany fees connected with imports of intellectual property and capital through licence agreements, user agreements, service agreements and the like, the Brazilian equivalent of the RPM and CPM are the options. The Federal Revenue authorities and taxpayers show a preference for the formulæ methods, as tests rely on the company’s accounting information and reviews are becoming easier and quicker. The adoption of the Brazilian version of the CUP method is uncommon because it is not formulary.

They are based on arithmetic average prices or the costs of identical or similar goods, services or rights in the Brazilian and/or foreign markets. They require a maximum gross margin of 20% for Brazilian import transactions, unless an independent price can be established using the Brazilian CUP. The interaction of the non-resident’s transfer pricing rules and the Brazilian deductibility ceilings of its domestic transfer pricing methodology often leads to double taxation. This is because the income may still be included in the tax base abroad based on the adoption of the arm’s length principle.

In the case of treaty jurisdictions, the resulting double taxation may be difficult to resolve, since Brazil eliminates the relief under article 9(2) (corresponding adjustment) from its own negotiation Model, which is based on the OECD and the UN Models. Brazil sees double taxation as a matter for the residence country to deal with.

As for the allocation of costs in Brazil concerning the development of intangibles overseas, Brazil assumes that an undue allocation may take place, and the tax authorities perform a rigorous analysis of evidence that should prove the connection between the use of the intangible and the Brazilian subsidiary. Any reimbursement is subject to transfer pricing and treated as income in the form of service fees.

3.6. Intercompany industrial property fees

Brazil does not apply transfer pricing to intercompany transactions with industrial property. So royalties due for the use of know-how, technology, technical assistance, patents, trademarks etc. fall under this rule. Instead, Brazil has a regulatory framework that allows for the limited deductibility of outbound payments of industrial property royalties.

The understanding has been that neither the Brazilian methods nor the OECD’s traditional transaction methods suffice to properly cover the analysis of this kind of intangible item. The tax authorities decided to establish limits for payment and deduction. Being artificial and random, it is an arbitrary method, but also one that is simple and objective, to prevent evasion. It is an important restriction applicable to any country. Germany, for example, adopts a somewhat similar approach to intercompany royalties, at least with respect to the rationale concerning the idea of limiting remittances, although the restriction is applicable to beneficiaries located in tax havens.

Companies can deduct outbound royalty payments and other payments related to technical assistance and technical and administrative services associated with transfers of technology and know-how at up to 5% of the net revenue of products manufactured or sold. If such services resulted in no transfer of technology or know-how, they would be subject to transfer pricing. The Brazilian tax authorities consider that this approach and the general rules of deductibility of expenses and the related framework available in the tax legislation seem to suffice for now to prevent BEPS. Remittances of these royalties are subject to the same limits applicable to deductions.

4. Conclusion

The context of the 21st century is one of aggressive global tax dispute and harmful tax competition. Countries have reduced corporate income taxation and offer disguised state aid or tax benefits to attract multinationals. This
explains the crisis in corporate income tax and transfer pricing. We seem to have approached the moment when corporate income taxation and the concept of the OECD arm’s length principle should be revisited.

Most of the OECD member countries now defending DST on tech companies disregarded economic theories that support source taxation on business profits, and are now using the same arguments that Brazil used in favour of source taxation for the pre-digital and digital economies.

Brazil assumes that multinationals may use tax and transfer pricing planning and that source taxation of business profits leads to economic justice. The current dispute about digital taxation suggests that international equity may be a lot about interpretation, depending on the moment and the actors, but also implies that the OECD Model may not provide for the fair allocation of taxable income and taxing rights.

If the arm’s length principle is not functional, a more formulary alternative to transfer pricing should be discussed. The shift to a formulary approach also requires the adoption of withholding taxation on business profits. The intense debate over DST suggests that many countries, including members of the OECD, see the end of the OECD PE exception as a reasonable next step and believe that their consumer markets must be monetized for the value they bring to the digital economy. This approach has been the cornerstone of the Brazilian BEPS policy. DSTs require the kind of legal support found in Brazil’s tax treaties, as their legal nature as a profit tax (or disguised as a turnover tax) challenges the OECD Model.