The Macroeconomics of Offshoring and Intergovernmental Policy Competition:

A Post-Keynesian Analysis of Key Aspects of Neoliberal Globalisation

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Abstract

The current era of neoliberal globalisation is distinguished from previous waves of globalisation primarily by the phenomenal growth of cross-border trade in tasks. Such traded tasks include not only those embodied in the offshoring of production, but also managerial tasks such as the shielding of profits for tax minimisation purposes. Rather than try to reign in offshoring and tax avoidance, most governments around the world have facilitated and intensified these processes in recent decades by competing on tax rates and other policy variables to appease multinational corporations and attract a part of their soaring foreign direct investment flows. Recognising a gap in the literature, this thesis analyses these issues from a post-Keynesian perspective. The key phenomena of offshoring and intergovernmental policy competition are explored empirically and their macroeconomic effects are modelled through short-run and long-run models. These models, primarily Kaleckian in nature, shed light on key modern macroeconomic phenomena, such as growing inequality, the global race to the bottom in corporate tax rates, rising FDI flows, secular stagnation, and low inflation rates. The models, it is argued, also have clear implications for policy. Lastly, a case study of Ireland is also presented, where an econometric approach is taken to try to disentangle of the effects of tax competition from the effects of an increasing profit share on demand and output. In sum, this thesis contributes to a clearer understanding within a demand-led framework of the role and macroeconomic effects of offshoring and intergovernmental policy competition in modern global capitalism.

Keywords: Offshoring, foreign direct investment, post-Keynesian macroeconomics, neoliberal globalisation, profit shifting, tax competition

La macroéconomie des délocalisations et la concurrence des politiques intergouvernementales: Une analyse post-keynésienne des principaux aspects de la mondialisation néolibérale

Résumé

L'ère actuelle de la mondialisation néolibérale se distingue des vagues précédentes de mondialisation principalement par la croissance phénoménale du commerce transfrontalier des tâches. Ces échanges de tâches comprennent non seulement les tâches liées à la délocalisation de la production, mais aussi les tâches de gestion telles que la dissimulation des bénéfices à des fins de minimisation fiscale. Plutôt que d'essayer d'endiguer les délocalisations et l'évasion fiscale, la plupart des gouvernements du monde ont facilité et intensifié ces processus au cours des dernières décennies en rivalisant sur les taux d'imposition et d'autres variables politiques pour apaiser les multinationales et attirer une partie de leurs flux d'investissements directs étrangers en pleine expansion. Reconnaissant une lacune dans la littérature, cette thèse analyse ces questions dans une perspective post-keynésienne. Les phénomènes clés de la délocalisation et de la concurrence des politiques intergouvernementales sont explorés empiriquement et leurs effets macroéconomiques sont modélisés par des modèles à court et à long terme. Ces modèles, principalement de nature kaleckienne, éclairent les principaux phénomènes macroéconomiques modernes, tels que l'inégalité croissante, la course mondiale vers le bas des taux d'imposition des sociétés, l'augmentation des flux d'IDE, la stagnation séculaire et les faibles taux d'inflation. Les modèles ont également des implications claires pour la politique. Enfin, une étude de cas de l'Irlande est également présentée, où une approche économétrique est adoptée pour tenter de démêler les effets de la concurrence fiscale des effets d'une part croissante des bénéfices sur la demande et la production. En somme, cette thèse contribue à une compréhension plus claire, dans un cadre axé sur la demande, du rôle et des effets macroéconomiques des délocalisations et de la concurrence politique intergouvernementale dans le capitalisme mondial moderne.

Mots-clés: Délocalisation, investissement direct étranger, macroéconomie post-keynésienne, mondialisation néolibérale, transfert de bénéfices, concurrence fiscale

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The content of chapters 2, 3, 4, and 5 of this manuscript have been presented at various conferences over the last few years, including the 2019 and 2021 FMM conferences, the 2021 EAEPE conference, the 2021 PKES PhD conference, and the 2022 Nordic post-Keynesian conference.[1] Such work was also presented at a doctoral seminar at USPN and on numerous occasions in various fora associated with the IPE, such as the IPE research seminar, an IPE workshop, and most frequently among my colleagues in the newly named Growth Regime Working Group of the IPE. My thanks must therefore also go to all organisers, participants, and discussants associated with each forum.

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[1] The Forum for Macroeconomics and Macroeconomic Policies (FMM), European Association for Evolutionary Political Economy (EAEPE), and Post-Keynesian Economics Society (PKES).

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Ryan Woodgate

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1. General Introduction: Defining Features of the Current Era of Neoliberal Globalisation

Since the turn of the 21st century, the global economy has undergone significant and distinct structural changes due to the internationalisation of production and other business activities. The fertile conditions for the phenomenal growth in size and number of multinational corporations (hereafter MNCs) followed after decades of technical change in the 20th century that slashed transportation and communication costs as well as tariffs and other regulatory barriers (Huwart & Verdier, 2013, p.36). Offshoring—in terms of both in-house offshoring and offshore outsourcing[2]—has thus become a defining phenomenon of the current era of neoliberal globalisation, as footloose MNCs continuously create and rearrange their global value chains according to the "principle of global cost arbitrage" (Palley, 2015). Rather than just a continued increase in the trade of products, neoliberal globalisation is marked by what Grossman & Rossi-Hansberg (2008) call "trade in tasks". Such traded tasks include not only those embodied in the offshoring of production, but also managerial tasks such as the shielding of profits through elaborate accounting schemes for tax minimisation purposes.

Rather than try to reign in the offshoring and profit shifting of MNCs, governments around the world have instead largely facilitated, if not intensified, these processes through policy competition aimed at attracting foreign direct investment (FDI). This includes not only corporate tax competition but also other forms of fiscal incentives and targeted state aid. This has led to what Narula and Zhan (2019) call the "MN[C]-assisted development strategy", where governments of developing and emerging economies actively try to attract MNCs through tools like special economic zones (SEZs), i.e. jurisdictional enclaves with low taxes and tariffs, reduced regulations, and other low-cost business conditions. Moreover, policy competition appears to be an important part of the growth strategy of established and more recently developed national economies, like Ireland, Luxembourg, the Netherlands, Singapore and Switzerland (Zucman, 2014; Saez & Zucman, 2020). Even if policy competition has little to no effect on FDI inflows in other advanced economies, many appear to be have nonetheless engaged in this quintessentially beggar-thy-neighbour phenomenon, judging by the widespread participation in the race to the bottom in corporate tax rates and increased number of state-backed investment promotion agencies (Danzman & Slaski, 2021). Intergovernmental policy competition has become rife in the current era of neoliberal globalisation. As such, it serves as another distinguishing feature, in addition to the offshoring of increasingly powerful MNCs.

Although neoliberal globalisation has prevailed since the 1990s (Palley, 2015; 2018), model-theoretic analysis of its defining features has been surprisingly scarce in the post-Keynesian tradition in the decades that have elapsed since. On the matter of intergovernmental policy competition, there would appear to be no distinctly post-Keynesian research in the literature prior to that contained in this thesis.[3] On the matter of offshoring, there has been a

[2] In-house offshoring implies the parent MNC owns a substantial stake in the foreign affiliate to which it moves production, whereas offshore outsourcing implies the contracting of production out to a third-party firm in a foreign country. See OECD (2007) for further details. Note, unless specified otherwise, we will take offshoring to mean both in-house offshoring and offshore outsourcing throughout this thesis.

[3] Deprez (2003), published in the Journal of Post Keyneian Economics, perhaps comes closest. It is, nonetheless, rather a general account with but a couple of minor references in post-Keynesian ideas.

good deal of empirical work, partial analysis, and non-theoretical accounts of offshoring from a post-Keynesian perspective, but no full model except that seen in Schröder (2020)—though this model is restricted to the short run and to the issue of offshore *outsourcing* specifically. The empirical work and partial analysis that does exist tends to emphasise the significance of offshoring. For example, Milberg & Winkler (2010, 2013), Auvray & Rabinovich (2019), and Rabinovich (2020) argue that offshoring can explain, especially when paired with the process of financialisation, how profits have increased while investment has slowed down in advanced economies in recent decades. Milberg (2006) describes how offshoring likely underlies the concurrence of growing profits with low and stable inflation in recent decades, whereas Palley (2015) stresses the role of footloose production in the emergence of large and sustained current account imbalances. Empirical work tends to find evidence that offshoring leads to (further) deindustrialisation (Boulhol & Fontagné, 2006), weakened labour bargaining power (Bronfenbrenner 2000), stagnant and polarised wage rates (Feenstra & Hanson, 2001), and falling wage shares of national income (Milberg & Winkler, 2010, 2013; Guschanski & Onaran, 2021). This work underlines the importance of offshoring. Yet the paucity of comprehensive post-Keynesian theoretical models of offshoring motivates the need for further work.

Mainstream economic theories of multinational production and offshoring (e.g. Helpman 1984, Venables 1999, Grossman & Rossi-Hansberg 2008) and tax competition (Mankiw et al. 2009) are abundant relative to the dearth of post-Keynesian approaches. Many of these approaches are rooted in unbounded rationality, optimising behaviour, investment as determined by the cost of capital, and a lack of fundamental uncertainty, among many other core assumptions at odds with a post-Keynesian approach. Hence, the comparison further emphasises there is a large gap in the literature that ought to be addressed.

It is against this backdrop that this thesis is motivated. The purpose of this collection of essays is to shed light on the two sides of the coin of neoliberal globalisation, namely offshoring and intergovernmental policy competition. In so doing, this thesis develops a basis for what might be thought of as a post-Keynesian theory of production location. It proceeds from accepting the fundamentally post-Keynesian insight that effective demand determines the level and rate of output, employment, and investment of any given multinational, but then recognises that the principle of effective demand does not determine *where* that multinational's output, employment, and investment will be located. The essays presented here investigate what happens when international business cost differentials—for example, wage and tax rate differentials—partly determine the location of multinationals' tangible capital (especially for production purposes) and intangible capital (especially for tax minimisation purposes). The models presented herein also allow one to understand within a demand-led framework the macroeconomic prudence—or lack thereof—of policies designed to attract multinationals.

This thesis is comprised of six chapters. Following this general introduction is a richer and fuller description of the current era of neoliberal globalisation in chapter two and the simplest of the models introduced in this thesis. It includes empirical data on the key trends of neoliberal globalisation, such as FDI flows, the rising share of MNC profits out of total global profits, falling corporate tax rates, and the proliferation of special economic zones and investment promotion agencies around the world. Against this backdrop, it explores the complementary notions of "the commercialisation of state sovereignty", introduced by Palan (2002), and "barge economies", as defined by Palley (2015). The simple model presented later in chapter two is a short-run model that tries to incorporate as broad a notion of

intergovernmental policy competition as possible. Though highly stylised, it is intended to serve as a simple and useful starting point for understanding the core issues presented in this thesis.

Chapter three develops a long-run Kaleckian model of offshoring, in which "Northern" MNCs establish and invest in foreign affiliates in the low-wage "South" so as to increasingly offshore production of its intermediate goods and cut overall labour costs by doing so. This chapter is concerned with the macroeconomics effects of offshoring in the FDI-source country (the "North") and FDI-recipient country (the "South") rather than policy competition, but has implications for the latter as well. The model, it is argued, sheds light on a number of modern macroeconomic phenomena, such as high profits in a period of low and stable inflation, falling wage shares, hysteresis and structural unemployment, and secular stagnation.

The topic of chapter four returns to the macroeconomic effects of intergovernmental policy competition, but now the focus is on corporate tax competition specifically. Another Kaleckian model is presented, from which the conditions under which demand and growth may be boosted by tax competition are derived. Unlike the short run model of chapter two that allows for profit shifting, the model presented in chapter four extends to the long run but simplifies by neglecting the possibility of profit shifting. The main conclusion from the model is that it is possible, in principle, for an economy to be "tax-competition-led", where lowering the effective corporate tax rate increases demand through increased MNC investment and in spite of the negative effect on government expenditure given a balanced budget. Such tax competition-led demand is nonetheless found to be unlikely in many cases given the existence of a coordination problem that lessens or nullifies the effect of lowering AECTRs when many countries do so simultaneously. This problem is referred to as the 'paradox of tax competition', since, like other fallacies of composition commonly identified in post-Keynesian thought, this is a phenomenon where the benefits of one country acting alone are reduced or eliminated if other countries act the same way at the same time.

Unlike the chapters that precede it, chapter five takes an econometric approach and focusses on the case study of the Republic of Ireland. It is motivated by the concern that econometric estimates of the Irish demand regime seen in the literature, which mostly find it is profit-led, are biased by omitted variables related to Ireland's role as a tax haven and as a host for many of the world's largest MNCs. This hypothesis is tested by using data less subject to MNC-related distortions and by introducing control variables, such as measures of average effective corporate tax rate and the shifted profits of MNCs in Ireland, into regression analysis of the effect of the unit labour costs on the components of Irish demand. Regressions are run using both ordinary least squares and three-stage least squares approach, the latter in an attempt to reduce the threat of simultaneity bias inherent in demand regime estimation. The main finding is that Ireland is wage-led once the real and distortionary effects of MNCs in Ireland are accounted for. The results also suggests that Ireland may indeed be—or may have been—tax competition-led, in the sense described by the theory in chapters two and four.

Chapter six briefly concludes by underlining the main results that can be taken from the thesis in general in a discussion of the possible futures for neoliberal globalisation. The bigger-picture implications for policy are discussed, as are the ideas for potential avenues of further fruitful work on the important topics of internationally mobile production and intergovernmental policy competition.

2. Multinational Corporations and Commercialised States: Can State Aid Serve as the Basis for an FDI-Driven Growth Strategy?

Abstract

In recent decades, governments around the world have increasingly used various forms of state aid to try to attract and retain the business activity of foreign-owned multinational corporations. Yet, in most cases, this "commercialisation of state sovereignty" (Palan, 2002) has failed to catalyse foreign investment and economic growth as intended. This chapter seeks to understand the general failure of such commercialised state strategies, while also explaining how demand and income growth in some notable exceptions (e.g. Ireland and Singapore) can be understood. To this end, a simple demand-led model is presented that suggests that foreign-targeted state aid may lead to beggar-thy-neighbour, FDI-driven growth in one economy if certain conditions are met, such as there being sufficiently little policy competition from other countries. It is shown that the exceptional cases tend to be the early movers, i.e. those few economies and special economic zones that engaged in the commercialisation of state sovereignty before the widespread competitive emulation that followed. This chapter argues that state aid for the attraction of foreign multinationals is unlikely to be an effective growth strategy in the current environment of intense state competition and that international coordination on corporation tax and other forms of state aid is desirable.

2.1 Introduction

In recent decades, governments around the world have increasingly used various forms of state aid to try to attract and retain the business activity of foreign-owned multinational corporations. This kind of "commercialisation of state sovereignty" (Palan, 2002), reflected in falling effective corporate tax rates as well as rapidly increasing numbers of special economic zones (SEZs) and investment promotion agencies (IPAs) around the world, has become a defining feature of neoliberal globalisation. Such trends, which will be analysed in depth in the following section, reflect the beliefs of policymakers around the world that they can catalyse economic growth through the state-sponsored appeasement of foreign multinationals.

Yet, as noted by Dunning & Lundan (2008) and Danzman & Slaski (2021), there is a good deal of consensus that, in most cases, tax incentives and other related state commercialising strategies simply do not work as intended. Frick et al. (2019), ADB (2015), and Farole (2011) conclude that most SEZs fail to outperform their surrounding host economies and those that do perform well do not tend to do so for long. Torslov et al. (2018) and Saez & Zucman (2020) show that multinationals predominantly shift profits to low-tax jurisdictions rather than tangible capital or employment, and that lowering corporate tax rates in high-tax jurisdictions does little to prevent the shifting of profits. Hence, despite the proliferation of

growth strategies based on the commercialisation of state sovereignty, there is scant evidence that they consistently spur economic growth in the majority of cases.

However, there are exceptional cases where state commercialising strategies do appear to drive growth. Generally, the high rates of growth of national income in numerous tax havens are widely seen as dependent on their ability to attract the financial flows of foreign multinationals. As Saez and Zucman (2020, p. 83) point out, the ratio of corporate income tax revenues to national income in Malta, Luxembourg, Hong Kong, Cyprus and Ireland are amongst the highest in the world, despite—or, rather, because of—some of the lowest effective rates of corporation tax in the world. The authors also argue that, despite statutory rates of zero percent, traditional tax havens such as the Bermuda and the British Virgin Islands also "generate serious revenue" through charging flat fees on company registration and re-registration (p.84). Through attracting, taxing and spending these foreign capital flows that would otherwise be the tax base of foreign countries, some tax havens appear to successfully fuel aggregate demand and growth in this quintessentially beggar-thy-neighbour way.

Moreover, there appear to be further exceptional cases where tangible capital and employment is attracted through the commercialisation of state sovereignty, rather than just financial capital in the form of shifted profits. For example, the phenomenal growth of Ireland and Singapore is associated not just with the gains of tax base erosion, but also with high rates of employment and investment of foreign multinationals whose presence is widely seen as being induced through an array of policy incentives (Soon & Stoever, 1996; Garcimartín et al., 2008; Nabeshima & Nabeshima, 2012; Woodgate, 2021b). Furthermore, a few exceptional SEZs have also proven to be highly successful. ADB (2015, p.105) and Amirahmadi and Wu (1995) single out a few early SEZs in China, Malaysia, South Korea, and Taiwan as performing particularly well. Moreover, data provided in UNCTAD (2019, p.179-181) and ADB (2015, p.88) show that a large majority of foreign direct investment (FDI) in China, Vietnam, and Malaysia has taken place in their SEZs in recent years.

Against this backdrop, this chapter attempts to shed light on the following two central questions. Firstly, why do state commercialising strategies appear to be able to spur economic growth in a few exceptional cases, but not in general? Second, how—i.e. through which channels—does the commercialisation of state sovereignty increase effective demand and income growth in those exceptional cases? This paper addresses these questions in a simple demand-led macroeconomic model, where two theoretical categories of commercialised states are identified and analysed, namely tax havens and export platforms. For the purposes of this chapter, the former is defined as an economy where a commercialised state strategy leads to the inflow of shifted profits whereas the latter receives inflows of tangible capital as a result.

In response to the second research question, our simple model shows that, under certain conditions, tax havens may boost demand and national income through the spending of increased tax revenues collected from foreign multinationals engaged in profit shifting. In export platform economies, growth of demand and income is more likely to occur through the greenfield investment and employment needed to facilitate the growth of the genuine exports of foreign affiliates. It is argued that, in both cases, the success of state commercialising strategies in spurring growth largely depends on the extent to which tax havens and export platforms manage to differentiate between domestic and foreign-owned firms when granting

tax incentives and other forms of state aid. For example, tax incentives offered to domestic firms immediately decrease tax revenue collected, whereas those offered exclusively to foreign multinationals may increase revenues through expanding the tax base. Given an exogenously fixed public budget position, this leads to higher government expenditure. The growth conditions for "traditional" tax havens, which are those that do not differentiate between foreign and domestic firms, are shown to be more difficult to fulfil than "modern" tax havens, which target foreign multinationals exclusively and tailor their incentive packages in response.

Regarding the first research question, we argue that state commercialising strategies most often do not spur growth because of a coordination problem. Our model predicts that one country acting alone in offering state aid to foreign multinationals may boost national income, but many countries doing so simultaneously may not. Furthermore, it is supposed that if a competing commercialised state in the same region already offers an effective rate of corporate tax—broadly defined to include subsidies and benefits in kind—that is sufficiently close to some political, legal or economic minimum, then the commercialisation of state sovereignty can only fail to boost growth. This generalises the "paradox of tax competition" argument seen in Woodgate (2020) to include kinds of incentives not restricted to just corporate tax incentives and to incorporate effects on demand not limited to greenfield FDI inflows.

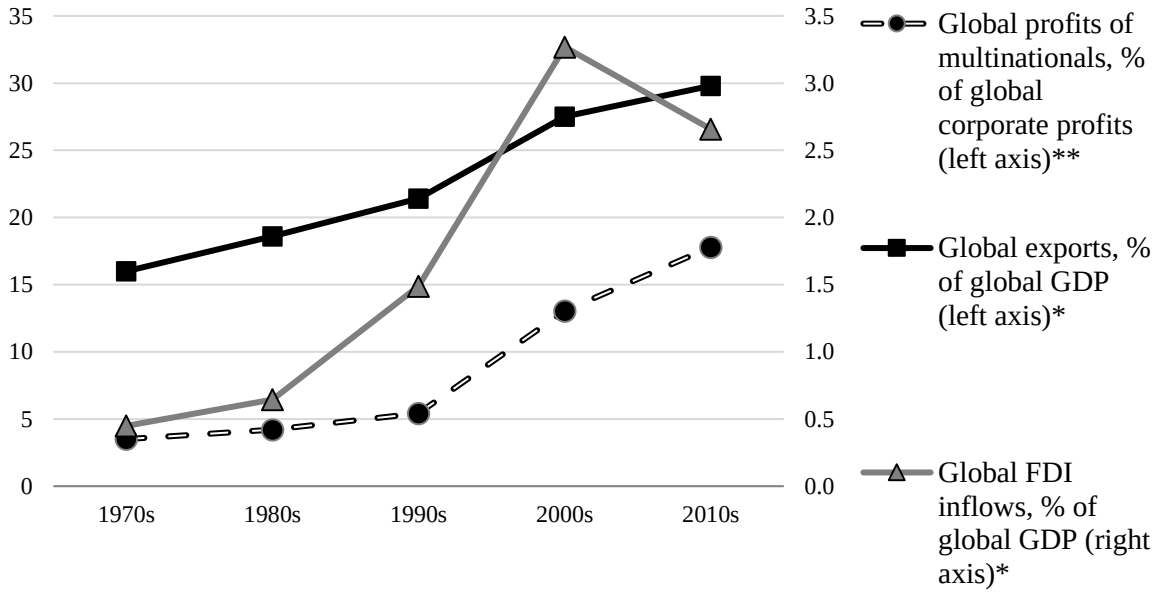
From this central thesis, it follows that there is an early mover advantage in the commercialisation of state sovereignty. Indeed, it is held that most, if not all, of the exceptional successes (of Ireland, Singapore, and SEZs in Shenzhen and Taiwan and so on) can be explained by the fact that they were among the first to compete when there was little competition in their respective regions. From this, it follows that the commercialised states that managed to grow through this beggar-thy-neighbour strategy are generally not good models for other countries now wishing emulate their economic success.

The chapter proceeds as follows. Section 2.2 defines the commercialisation of state sovereignty and, with reference to the relevant data, argues that it is now so widespread that it has come to be a defining feature of modern neoliberal globalisation. Section 2.3 explains how tax havens and export platforms both tend to exhibit high trade surpluses and uses this as the basis for a simple model to find the conditions under which the attraction of foreign multinationals may induce growth. Section 2.4 analyses the implications of this model, particularly in relation to our research questions, while section 2.5 concludes.

2.2 Neoliberal Globalisation and the Commercialisation of State Sovereignty

A key difference between the current and previous waves of globalisation lies in the "increased international mobility of means of production (capital and technology) resulting from improvements in transportation, communication, and ability to manage globally diversified production networks" (Palley 2015, p. 53). Such globalised production networks, Palley continues, are "configured on the principle of global cost arbitrage", whereby it is "as if factories are placed on barges that float between countries to take advantage of lowest costs – which can be due to under-valued exchange rates, low taxes, subsidies, absence of regulation, or abundant cheap exploitable labor" (*ibid.*). Palley and others refer to this most recent kind of

Figure 2.1 *Neoliberal globalisation: Steady increase in global trade vs. sudden increases in FDI and the profits of multinationals (decade averages)*



***Sources**:* *World Bank (2020) **Saez & Zucman (2020)

globalisation as "neoliberal globalisation", which he categorises as the third wave of globalisation that began in 1990 and that runs until today. Given that the first instances of this "barge economics" phenomenon occurred before 1990, he also accepts that such a discrete periodisation has, by necessity, a somewhat arbitrary element about it (2018, p.6).

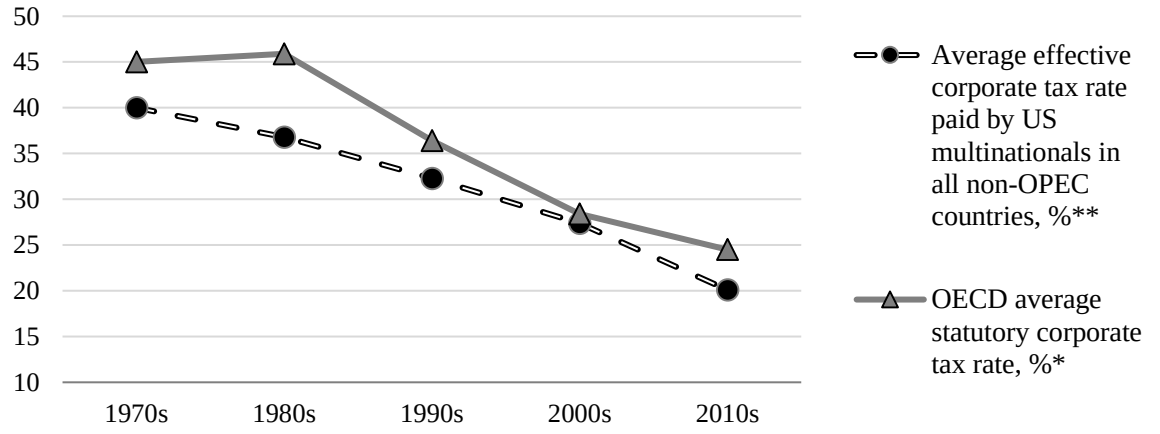
Empirically, the 1990s appears to a reasonably good approximation for the start date of neoliberal globalisation. As Figure 2.1 shows, the share of worldwide exports in global GDP increased in a steady and linear fashion every decade since the 1970s, whereas it is only in the 1990s that the share of worldwide foreign direct investment (FDI) inflows in global GDP really take off. Similarly, it is around the 1990s that multinationals' share of global corporate profits increases sharply. From this, it is clearly evidenced that multinational corporations and global value chains are central to the era of neoliberal globalisation.

In this paper, we will argue that another key aspect of neoliberal globalisation is what Palan (2002) calls the "commercialisation of state sovereignty". Although Palan (2002) does not offer a precise definition, here we will take the term to refer to the phenomenon whereby the state aligns its laws and regulations with the interests of foreign multinationals in order to attract and retain their business activity. Such business activity can be related to genuine production (e.g. investment and employment) or intangible capital flows (e.g. profits and intellectual property). The term could also be applied to the efforts of policymakers to appeal to the desires of wealthy individuals for financial secrecy and tax minimisation as well, but that is not the focus in this chapter. Here, our use of the term will be more in line with Saez and Zucman (2020, p.83), who write that commercialised states are those that have "sold multinationals the right to decide for themselves their rate of taxation, regulatory constraints, and legal obligations".

Palan (2002) describes the commercialisation of state sovereignty in the context of tax havens in particular since they "perfected" the strategy, but also mentions that tax havens are not the only states to do so (p.172). In a different paper (Palan, 1998), he suggests other kinds of commercialisation of state sovereignty, albeit not by this name. The author notes that nations offering special economic zones (SEZs)[4] and flags of convenience[5] are similar to tax havens: "the principle common denominator is that they have come about as states [that] use their sovereignty, or their right to write the law, often deliberately, to create special territorial or juridical enclaves characterised by a reduction in regulations, including taxation" (p.626).

Evidence of the widespread nature of the commercialisation of state sovereignty abounds. For example, the race to the bottom in corporate tax rates around the world is widely seen as the result of governments' attempts to attract foreign multinationals or appease domestic firms in order to prevent them from moving abroad (Saez & Zucman, 2020, ch. 5). The average statutory corporate tax rate across the OECD halved from 47% in 1981 to 23.5% in 2019 (OECD 2021). Using decade averages, as shown in Figure 2.2, we can see that this persistent fall in statutory corporate tax rates appears to begin in the 1990s, though our measure of the effective corporate tax rate faced by multinationals around the world begins to fall before the 1990s.[6]

Figure 2.2 *Falling corporate tax rates around the world (decade averages)*



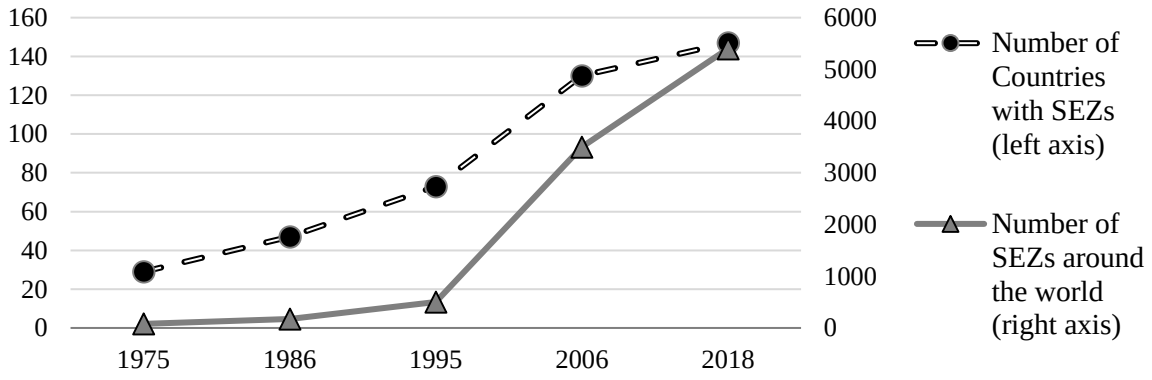
***Sources**:* *OECD (2021), Khan et al. (2020) **Wright & Zucman (2018), BEA (2020)

A second indicator of the intensive and extensive nature of the commercialisation of state sovereignty is displayed in Figure 2.3, which shows estimates of the number of SEZs worldwide, as well as the number of countries that have established SEZs. Again, it appears to be around the 1990s that SEZs begin to become extremely widespread. UNCTAD (2019)

[4] UNCTAD (2019, p.128) defines SEZs as "geographically delimited areas within which governments facilitate industrial activity through fiscal and regulatory incentives and infrastructure support".
[5] A flag of convenience is the business practice of registering a ship or aircraft in a country other than that of its owners in order to reduce or eschew operating and regulatory costs.
[6] Following Wright and Zucman (2018), this effective corporate tax rate measure is defined by the ratio of foreign income tax paid by majority-owned affiliates of US multinationals in non-oil exporting nations to the "profit-type return" of these affiliates, as reported in BEA (2020) "Activities of US MNEs abroad" survey.

estimate that the number of SEZs in existence around the world grows from 500 to 3500 between 1995 and 2006. The proliferation of SEZs demonstrates a kind of commercialisation of state sovereignty, albeit a kind that does not necessarily improve the attractiveness of the entire state to foreign multinationals, but rather a well-defined area within it.

Figure 2.3 *Proliferation of special economic zones around the world*



Source: UNCTAD (2019)

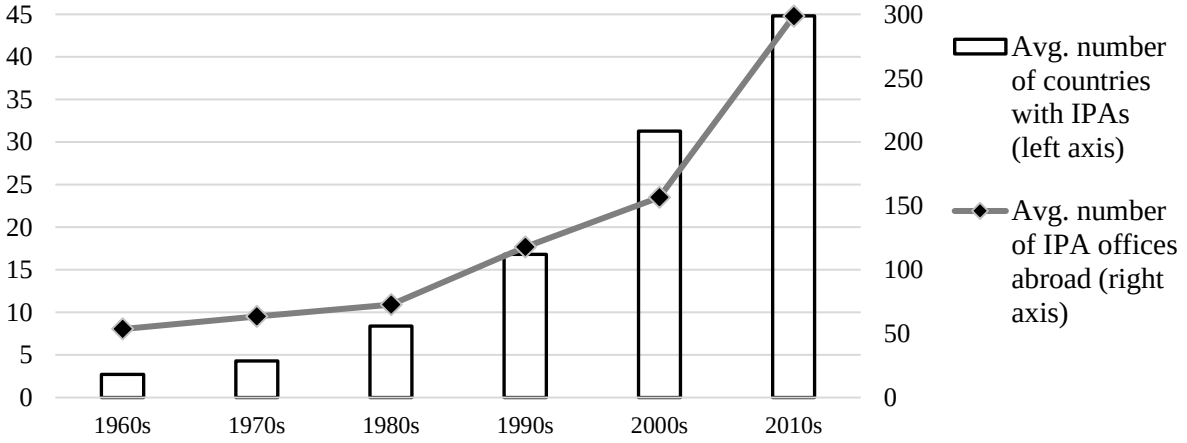
Table 2.1 *Investment attraction tools and their prevalence in SEZs around the world*

Incentives	**Measures include…**	
Fiscal incentives	Complete tax exemptions	68%†
72%* - 92%†	Performance-based tax deductions	18%†
	Reduced tax rates	7%†
Special customs	Import duty exemption on…	
74%* - 95%†	Capital equipment & material inputs	55%†
	Capital equipment only	40%†
Investment facilitation	Legal and technical advice	
32.3%*	Relaxed recruitment and employment regulation	
Investment protection	Assurances SEZ firms cannot be expropriated or affected by	
26.0%*	newer domestic laws	
Preferential land use	Exemptions from lease payment	
25.2%*	Reduced rent	
Trade facilitation	Simplification of tax filing obligations	
17.3%*		
Infrastructure	Provision of electricity, gas, water, communication utilities	
16.5%*		
Social amenities	Provision of educational, health, or recreation facilities	
3.1%*		

* Of a sample of 127 SEZs (UNCTAD 2019, pp. 166-167)
† Of a sample of 553 SEZs (CIIP 2017, p. 19)

SEZs around the world offer a broad range of incentives to lure in foreign capital, as is reflected in Table 2.1. The survey data employed come from two sources, one referring to a sample of 127 SEZs (UNCTAD, 2019) and the other to a larger sample of 553 SEZs around the world (CIIP, 2017). Chief among these incentives are tax exemptions, tax holidays, or a reduced corporate tax rate, as well as an elimination or reduction of import tariffs and VAT. In the CIIP sample, 68% of SEZs offer a complete corporate tax exemption, 18% offer exemptions based on firm qualifications and performance (e.g. number of persons employed, percentage of output that is exported, amount of investment, etc.), and 7% offer a reduced rate. In a third of the SEZs in the UNCTAD sample, a government-backed "one-stop-shop" for legal, bureaucratic, and/or technical advice is available and labour hiring and firing procedures are relaxed. Other legal assurances and offers of low rent at favourable conditions are found in around a quarter of surveyed SEZs, whereas other incentives seen in Table 2.1 are less common.

Figure 2.4 *Growth in the number of national IPAs and their offices abroad (Sample of 51 countries across the OECD, Latin America and Caribbean)*



Data: *Martincus & Sztajerowska (2019)*

A third and final trend closely associated with the commercialisation of state sovereignty is the rapid growth of investment promotion agencies (IPAs) around the world. Most frequently, IPAs are public agencies whose primary mandate is to attract and retain inward foreign investment, usually with a clear preference for greenfield FDI projects (OECD, 2018b). They do so through a number of means. Among other functions, IPAs typically advertise the business environment of their region, target particular sectors, reach out to desired foreign companies, act as an intermediary between foreign corporations and local government, and offer or negotiate deals with foreign firms regarding tax, tariffs, and subsidies. As Danzman and Slaski (2021, p.2) put it, "IPAs are the bureaucratic gatekeepers of incentives, and are the part of the state that works most closely with multinational enterprises to encourage them to pursue local investment opportunities." As Martincus & Sztajerowska (2019, p.xxi) point out, now "virtually each country has at least one IPA that seeks to attract and facilitate FDI". Yet, this is a very recent phenomenon. As Figure 2.4 makes clear, the number of countries across the OECD, Latin American and Caribbean regions with IPAs, as well as the number of foreign offices of each IPA, has ballooned only in recent decades.

From this data follows the first central point to be advanced in this chapter, namely that Palan's "commercialisation of state sovereignty", broadly defined, is the other side of the coin to Palley's "barge economics". Where Palley rightly declares that neoliberal globalisation "has been driven by corporate restructuring of global production" (2018, p.29), we might add that it has also been intensified by governments keen to outcompete one another in order to facilitate and benefit from such global corporate restructuring. The two processes characterise the current era of neoliberal globalisation and have become intricately interwoven.

2.3 Growth conditions for commercialised states

The data on corporate tax rates, SEZs, and IPAs strongly suggest many policymakers around the world believe their incentives may attract some part of the business activity of foreign multinationals, and that the establishment of foreign affiliates will stimulate regional or national economic growth. However, as mentioned in the introduction, reviews of the literature tend to find that effective state commercialising strategies appear to be the exception rather than the rule. In this section, we develop a simple model that may help explain why this is the case.

2.3.1 Two kinds of commercialised states

In this chapter, we focus on two theoretical categories of commercialised states in particular, *tax havens* and *export platforms*. In reality, the two categories can and do overlap. However, for the purposes of our analysis it will serve us well to make the theoretical distinction.

Though there are a number of definitions of tax havens and ways to identify them, here we will take a tax haven to be any country that is a net recipient of the shifted profits of foreign multinationals. Three channels of profit shifting have been observed in the literature (Cobham & Janský, 2020). First, through *transfer mispricing*, a subsidiary in a low-tax jurisdiction receives intergroup imports at artificially low prices (i.e. at cost or near-cost price) and exports to consumers or other affiliates at (close to) market price. Second, through *intra-group royalty payments*, the multinational locates its intellectual property in the low-tax jurisdiction such that other affiliates around the world pay service fees for its use. Third, through *debt shifting*, loans are charged at high interest rates by the affiliate in the low-tax country to other affiliates in higher tax countries. In each case, the end effect is to reduce a multinational's worldwide tax bill by shifting its gross profits to affiliates in tax havens. Hence, indicators of tax haven status are usually given by especially low effective rates of corporate tax, high FDI inflows and foreign affiliate profitability ratios, and inflated measures of output, gross operating surplus, and the profit share. Based on these kinds of indicators, there is a strong degree of consensus in the related literature as to which countries are tax havens (Hines, 2010, Garcia-Bernardo et al., 2017; Tørsløv et al., 2018; Cobham & Janský, 2018, 2019).

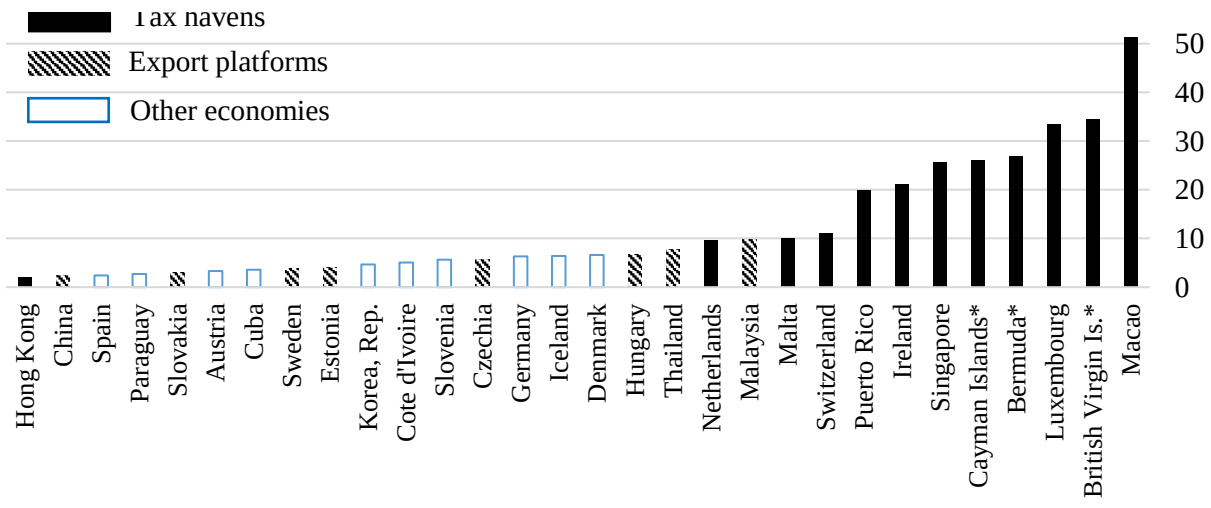
Important for our purposes is the distortionary effect of profit shifting on the trade balance of tax havens. As Tørsløv et al. (2018, p. 31) point out, the first two methods of profit shifting listed above are the most prevalent, accounting for around 85% of shifted profits

worldwide. They are also the methods that tend to inflate the net exports of tax havens and reduce the net exports of non-havens. For example, the authors estimate that, once corrected for effects of profit shifting, Ireland's reported trade surplus of 31% of GDP in 2015 turns into a trade *deficit* of 5.8%. Profit shifting is found to distort the trade balance of other (especially smaller) tax havens to an even greater extent (ibid., appendix table C5b).

The second theoretical category of commercialised state that will be analysed in more detail is what we term export platforms. In contrast to tax havens, export platform economies host foreign affiliates that are engaged in the genuine production of goods and services. However, these goods and services are predominantly destined for sale in other countries. This may be because the market of the host economy is small relative to the home and third markets. Alternatively, it may be influenced by policymakers who explicitly encourage exports through linking state aid incentives to the trade performance of foreign affiliates in order to, for example, protect indigenous infant industries from the threat of established foreign corporations. To the extent that policymakers aim to fill SEZs with foreign affiliates, it follows that SEZs are one kind of instrument of an export platform economy. Of course, they are not strictly necessary. For example, IPAs may be tasked with attracting foreign-owned export-oriented manufactures.

From this discussion, it follows that both types of commercialised states are likely to exhibit a relatively high percentage of trade due to foreign affiliates. In the case of tax havens, this increased foreign affiliate trade reflects profit shifting and tax planning, whereas in the case of export platforms this trade relates to genuine goods and services. Such considerations help us understand those countries found to have some of the highest trade surpluses on record. This is reflected in Figure 2.5, where all countries for which data was available in the World Bank database were ordered in terms of highest average trade surplus to GDP ratios across the 2010s. As an indicator of the trade surpluses of the traditional tax havens found in the Caribbean, three tax haven economies were added with data from UNstat (2021). Economies where a majority

Figure 2.5 *Top net exports-GDP ratios (%, 2010s average), exc. oil and precious metal exporters*



Sources: World Bank (2020), *UNstat (2021)

of exports is of fuels or precious metals are excluded, as are all economies where the average net export-GDP ratio is less than 2%.

Of the thirty economies in Figure 2.5, twelve can be considered as tax havens and eight as export platforms. Here, to be considered a tax haven, the economy in question must have been found to be a net recipient of shifted profits in the literature (Tørsløv et al., 2018; Cobham & Janský 2018, 2019). To be designated an export platform, at least 40% of the net exports of the non-haven economy in question must be due to foreign-owned firms, using data from the OECD Analytical Activities of Multinational Enterprises database (see Cadestin et al. 2018).[7] Tax havens tend to have some of the highest trade surpluses in the world. Export platforms, as defined here, are dispersed amongst the top thirty, and nearly all belong to either the SEZ-dependent Asian group (China, Thailand, Malaysia) or the Central and Eastern European group (Slovakia, Estonia, Czechia, Hungary), whose "FDI-oriented state strategies" (Drahokoupil 2009, p. 18) are well established in the literature (Bohle 2009, 2018; Bohle & Regan, 2021).

Though the two types of commercialised state are distinct, they are both induced by the same kind of government policies and likely have similar consequences regarding the trade balance. In the modelling approach that follows, these commonalities will be kept in mind. As a means to simplify the otherwise complex nature of state commercialising strategies, we will employ an especially broad definition of the effective rate of tax. The effective corporate tax rate on foreign affiliates is defined by

$$\tau_{FA} = \frac{T_{FA} - S_{FA}}{\Pi_{FA}}, \tag{2.1}$$

where T_{FA} is the tax collected from foreign affiliates, S_{FA} represents the output subsidies and the monetary value of all benefits to kind paid by the government to foreign affiliates, and Π_{FA} denotes the total profits of foreign affiliates. S_{FA} may include any of the investment incentives seen in Table 2.1 that do not affect T_{FA}, e.g. direct and indirect subsidies, reduced rent on public lands, provision and maintenance of infrastructure and amenities used by foreign affiliates, reduced compliance and bureaucratic costs, and so on. We will suppose S_{FA} is dependent upon genuine output, and so is paid by the governments of export platforms but not tax havens. Hence, τ_{FA} is bounded between zero and one in tax havens, but may be negative in export platforms.

2.3.2 Model

Presented here is a highly simplified two-period demand-led model in which prices and the capital stock are fixed. Foreign affiliates do not exist in the first period, only in the second. Hence, period one is the benchmark against which the macroeconomic effects of the presence and operation of foreign affiliates, seen in period two, are compared. A discrete, two-period model is preferred to a continuous alternative primarily because small changes in tax incentives are not likely to attract foreign multinationals, whereas large changes are. Profit shifting and tax base erosion, in particular, appear to be winner-take-all phenomena. Economies that

[7] 40% is, of course, a rather arbitrary threshold. In any case, as this is just illustrative, the exact threshold for the definition of "export platform" is unimportant for our ultimate purposes.

establish near zero effective corporate tax rates may receive shifted profits, but other, higher-tax economies that lower corporate tax rates slightly do not attract shifted profits as a result nor do they appear to prevent domestically made profits from being shifted out. Hence, the discrete periodisation is preferred to a continuous-time modelling approach.

We begin with the benchmark model of period one, i.e. with no foreign affiliates nor commercialised state strategies. We employ a simple Keynesian consumption function, where consumption (*C*) is a function of autonomous consumption (C_A) and the product of the marginal propensity to consume (*c*) and disposable income, given by the difference between national income (*Y*) and total income tax revenues (*T*)

$$C = C_A + c(Y - T). \tag{2.2}$$

Tax revenues are in turn given by the product of average effective tax rate (τ) and total income

$$T = \tau Y. \tag{2.3}$$

Investment (*I*) is given by

$$I = I_A + \gamma Y, \tag{2.4}$$

where I_A is autonomous investment and γ represents the responsiveness of investment to changes in the income level. Note that our simplified investment function assumes that the effective rate of tax has no direct effect on domestic investment.[8] Government expenditures (*G*) are dependent upon the exogenously determined fiscal budget parameter (*b*) and tax revenues

$$G = bT. \tag{2.5}$$

A value of *b* equal to one implies the government is following a balanced budget rule, greater than one implies a targeted deficit, and less than one reflects a persistent fiscal surplus. For simplicity, we suppose deficits are financed through money emission. Hence, we need not analyse interest payments nor debt dynamics. Lastly, a simplified net export function is employed, where net exports (*NX*) are determined by an autonomous part (NX_A) and an induced part in which η reflects the responsiveness of net exports to changes in the income level

$$NX = NX_A - \eta Y. \tag{2.6}$$

Solving for the equilibrium level of income in period one (Y_1^*), we find that

$$Y_1^* = \frac{E_A}{m - \tau_1(b - c)}. \tag{2.7}$$

All autonomous expenditures are captured in $E_A = C_A + I_A + NX_A$ and m is defined such that $m = 1 + \eta - c - \gamma$. Importantly, E_A and m will not vary between periods one and two, whereas the effective tax rate may vary (and is thus separated from the rest of the denominator). We make the usual assumption of Keynesian stability, i.e. we assume that $m - \tau_1(b - c) > 0$ at all times.

From equation (2.7) it follows that in the benchmark economy of period one with no foreign affiliates or state commercialising strategies, a decrease in the effective tax rate will

[8] For a related discussion, see Mott and Slattery (1994, p.404).

lower the equilibrium income level as long as the fiscal budget parameter is greater than the marginal propensity to consume ($b > c$). Of course, in any given real economy, this is likely always the case and so the benchmark economy reflects the conclusion of Kalecki (1944, p. 57) that "income tax financed expenditure… should be pushed as far as politically possible".

In period two, we wish to understand the effects on equilibrium national income due the operation of newly established foreign affiliates. We begin with the assumption regarding their behaviour. Throughout the analysis, we suppose that all foreign affiliate profits net of tax are repatriated out of the economy, such that net factor income receipts (*NY*) are given by

$$NY = -(1 - \tau_2)\Pi_{FA}, \tag{2.8}$$

where τ_2 is the effective rate of tax in the second period and Π_{FA} are the gross profits of foreign affiliates. Foreign affiliates may affect aggregate demand directly by their investment expenditure (I_{FA}) and by the value of their net exports (NX_{FA}). Supposing the functions determining the components of demand are otherwise the same as in period one, the additional aggregate demand in period two due to foreign affiliates is given by

$$AD_{FA} = I_{FA} + NX_{FA}. \tag{2.9}$$

Again, to keep the focus on the area of interest, we suppose that all foreign investment (I_F) is financed entirely by the foreign parent.

To find another expression for the net exports of foreign affiliates (NX_{FA}), we begin with the income statement of all foreign affiliates

$$\Pi_{FA} = X_{FA} + R_{FA}^{D} - M_{FA} - Mat_{FA}^{D} - W_{FA}, \tag{2.10}$$

where X_{FA} is the revenue generated by affiliates through exports and R_{FA}^{D} through domestic sales, M_{FA} represent the materials inputs that are imported and Mat_{FA}^{D} are those sourced domestically, whereas W_{FA} is the wage bill paid by foreign affiliates to (local) labour. We assume all revenues are generated through exports and all material inputs are imported ($R_{FA}^{D} = Mat_{FA}^{D} = 0$) or, to the same effect, that $R_{FA}^{D} = Mat_{FA}^{D}$. Under these assumptions, it naturally follows that

$$NX_{FA} = \Pi_{FA} + W_{FA}. \tag{2.11}$$

Since gross profits are equal to net profits (which are, in turn, equal to net factor income payments by equation 2.8) and the tax paid by foreign affiliates, we can express this as

$$NX_{FA} = \tau_2 \Pi_{FA} + W_{FA} - NY. \tag{2.12}$$

Lastly, assuming that the tax collected from foreign affiliates is injected back into the circular flow in the same period through government spending according to equation (5), we can write equation (2.9) as

$$AD_{FA} = I_{FA} + b\tau_2 \Pi_{FA} + W_{FA} - NY. \tag{2.13}$$

In equilibrium, the domestic product (Y^D) is equal to total aggregate demand, which is comprised of domestic aggregate demand and the aggregate demand due to foreign affiliates:

$$Y_2^D = E_A + Y_2[c(1-\tau_2) + \gamma + b\tau_2 - \eta] + AD_{FA}. \quad (2.14)$$

Substituting equation (2.13) into (2.14), we get

$$Y_2^D = E_A + Y_2[c(1-\tau_2) + \gamma + b\tau_2 - \eta] + I_{FA} + b\tau_2\Pi_{FA} + W_{FA} - NY. \quad (2.15)$$

Recognising that national income is equal to sum of the domestic product and net factor income receipts ($Y = Y^D + NY$), it follows that the equilibrium level of national income in period two is given by

$$Y_2^* = \frac{E_A + W_{FA} + b\tau_2\Pi_{FA} + I_{FA}}{m - \tau_2(b-c)}. \quad (2.16)$$

2.3.2.1 Revisiting the FDI-led growth hypothesis

Before we consider how particular commercialised state strategies may or may not work, it is worth briefly contextualising the model in its general form. Suppose, for now, that, for whatever reason, foreign affiliates are established in period two, but the effective rate of tax in period two is the same as in period one ($\tau_2 = \tau_1$). From equations (2.7) and (2.16), we can see that the equilibrium national income level increases in period two in proportion to the increase in foreign affiliate activity, whether in terms of investment undertaken or wages and taxes paid locally:

$$Y_2^* = Y_1^* + \frac{W_{FA} + b\tau_2\Pi_{FA} + I_{FA}}{m - \tau_2(b-c)}. \quad (2.17)$$

Our simple model thus suggests an economy may be "FDI-led" or "FDI-driven", in the sense that the establishment and operations of foreign affiliates, and the necessary FDI that goes with it, may lead to higher levels of equilibrium national income. Though Singer (1950) is best known for his reasoned doubts concerning the possibility of growth driven by FDI, our finding here is actually strongly in line with Singer's conclusion. Singer (1950, p.484) writes, "the main requirement [for the FDI-led growth] of underdeveloped countries would seem to be to provide for some method of income absorption". He suggests three ways in which foreign incomes may be absorbed (ibid.): First, via "the reinvestment of profits in the underdeveloped countries themselves", which is reflected in the I_F term in equation (2.17). We will refer to this as the investment channel. Second, via "the absorption of profits by fiscal measures and their utilization for the finance of economic development", which is clearly captured in the $b\tau_1\Pi_F$ term. We will refer to this as the tax channel. Or, finally, via "the absorption of rising productivity in primary production in rising real wages and other real incomes", which relates to the W_F term in equation (2.17). This will be referred to as the employment channel. Especially if the kind of FDI is not in the primary bur rather the higher value-added manufacturing and services sectors, and so the terms of trade problems associated with the Prebisch-Signer hypothesis are less relevant, then it stands to reason that an economy that attracts many foreign affiliates without lowering aggregate demand of domestic residents can expect to grow.

Thus, our short-run model in its general form supports the hypothesis that, in principle, an economy may be FDI-led. In the case of commercialised states that aim to achieve such FDI-led increases in national income, however, it remains to be seen under which conditions, if any, state aid may be used as a catalyst.

2.3.2.2 Growth conditions for tax havens

Let us now consider the growth conditions of tax havens, i.e. economies that are the recipient of shifted profits in the second period. Two conditions are imposed on the effective rate of tax in period two. First, it is lower than the rate in period one ($\tau_2 < \tau_1$) and, second, it is low enough to induce multinationals to set up shell companies in this low-tax economy to facilitate pure profit shifting for tax avoidance and evasion purposes. In order to induce foreign multinationals to do so, let us suppose the effective rate of tax must be no greater than some tax haven threshold tax rate (τ_{TH}):

$$\tau_2 \leq \tau_{TH} \tag{2.18}$$

Though the determinants of τ_{TH} can be said to be complex and varied, we can speak broadly of two kinds of determinants. It depends, firstly, on the effective rates of tax elsewhere in the relevant region (Woodgate, 2020). For example, if effective rates of tax are already near zero in other countries in which multinationals would consider locating, τ_{TH} may be effectively zero and our given economy cannot establish itself as a tax haven since it can no longer induce multinationals to change their tax planning arrangements. Second, τ_{TH} depends on international legal agreements and conventions surrounding corporation tax and the degree of enforcement of the corresponding rules. For the reasons Zucman (2014) explains, the current three pillars of international taxation—source-based taxation, arm's length pricing, and bilateral double taxation treaties—mean that tax differentials between countries enable and incentivise profit shifting in the first place. The exact nature of the international legal system surrounding the taxation of corporations affects the tax haven threshold, and, in principle, an alternative system could eliminate the threshold. We will return to the importance of the determinants of τ_{TH} later. For now, we accept that this hypothetical threshold exists and that our model economy will receive shifted profits by matching or undercutting it.

Importantly, the model economy is a pure tax haven in the sense that no genuine value-added is created by the new foreign affiliates in period two. We suppose that any legal or accounting costs of setting up and maintaining the shell company are negligible. Hence, in our model tax haven of period two

$$W_{FA} = I_{FA} = 0, \tag{2.19}$$

and so, in line with the discussion in section 2.3.1, any increase in the value of net exports actually reflects the value of shifted profits

$$NX_{FA} = \Pi_{FA}. \tag{2.20}$$

With this arrangement, this tax haven is left with an equilibrium level of income in period two that, by equation (2.16), is equal to

$$Y_2^* = \frac{E_A + b\tau_{TH}\Pi_{FA}}{m - \tau_{TH}(b - c)}. \quad (2.21)$$

Note that, for simplicity, we have set $\tau_2 = \tau_{TH}$, the maximum effective tax rate at which the economy can still establish itself as a tax haven. Comparing equations (2.7) and (2.21), we find that the condition for the increase of the equilibrium national income level ($Y_2^* > Y_1^*$) is

$$\Pi_{FA} > Y_1^* \left(1 - \frac{c}{b}\right)\left(\frac{\tau_1}{\tau_{TH}} - 1\right). \quad (2.22)$$

Equation (2.22) says that for this particular commercialised state strategy to spur growth, it must be that the value of shifted profits is sufficiently large. Sufficiency is determined by the size of the economy in period one (Y_1^*), the ratio of the marginal propensity to consume to the fiscal budget parameter, and the ratio of the effective rate of tax in period one to that of period two. For example, if $\tau_1 = 0.4$, $\tau_{TH} = 0.05$, $c = 0.7$, $b = 1$, then our simple model predicts an economy that attracts a value of shifted profits that is greater than 2.1 times the value of equilibrium national income in period one ($\Pi_F > 2.1 * Y_1^*$) will see an increase of income in period two. Hence, economic size matters a great deal—smaller or poorer countries are more likely to grow through this particular tax haven strategy. Also important is the degree of tax competition necessary for the economy to establish itself as a tax haven, i.e. how much lower τ_2 must be relative to τ_1, which is determined by the threshold rate (τ_{TH}) discussed above. If τ_{TH} is zero or sufficiently close to zero, then even the smallest economy could not grow through this commercialised state strategy.

Besides traditional tax havens, especially in the Caribbean, that are marked by low or zero rates of tax across many income streams and not just corporation tax, it seems many modern tax havens do not employ an especially low *average* effective rate of tax but rather a low effective rate on corporations alone. As such, the tax haven strategy modelled so far can be seen as a blunderbuss approach to attracting foreign multinationals. A more targeted approach of lowering the effective rates of tax on foreign affiliates exclusively could attract the activity of multinationals without leading to a reduction in tax revenues collected from domestic firms. Indeed, this is one of the main purposes of investment promotion agencies, namely seeking out foreign firms and tailoring the state aid package necessary to induce that firm to establish an affiliate locally. Alternatively, by filling SEZs primarily with foreign-owned firms, policymakers can achieve an effective rate of corporate tax on foreign affiliates that is lower than that faced by domestic firms.

It is easy to show that a "modern" or "targeted" tax haven that manages to keep domestic effective rates of tax constant across the two periods ($\tau_2 = \tau_1$) while charging an especially low effective rate of corporate tax on foreign affiliates alone, denoted τ_{FA}, has a much higher chance of growth. Supposing $\tau_{FA} \leq \tau_{TH}$, the growth condition for our model economy becomes

$$Y_2^* = Y_1^* + \frac{b\tau_{FA}\Pi_{FA}}{m - \tau_2(b - c)}. \quad (2.23)$$

In this hypothetical case, holding all else equal, the growth of national income is ensured as long as the tax haven threshold can be undercut.

Given this result, why would any commercialised state pursue the blunderbuss approach related to equation (2.22) rather than the targeted tax haven approach related to equation (2.23)? There are at least two highly relevant political constraints. First, it may be considered unacceptable to local firms that foreign-owned competitors pay less tax. Hence, there may be domestic pressures against the targeted approach. There are also political constraints imposed from abroad. Within the EU, offering tax advantages on a selective basis may be considered state aid and is prohibited in the general case (European Commission, 2021). However, lowering overall or statutory rates of tax, although increasingly frowned upon, is nonetheless considered an expression of state sovereignty rather than a beggar-thy-neighbour growth strategy that can be legislated against. World Trade Organisation rules may also limit the extent to which a targeted tax haven approach works (Daly, 2016). For such reasons, economies wishing to pursue a tax haven growth strategy may be constrained in the extent to which they can target foreign affiliates exclusively with tax incentives.

2.3.2.3 Growth conditions for export platforms

Lastly, let us consider a second period in which the model economy has attracted foreign multinationals whose affiliates are not mere shell companies, but produce and export genuine goods and services. We assume that there is no pressing constraint on the supply of labour in the economy such that any increase in the employment of foreign affiliates can be facilitated (and is facilitated, again, without wage or price inflation). We continue to suppose the overall effective tax rate does not change between the two periods ($\tau_2 = \tau_1$) and that foreign multinationals are attracted through the targeted foreign effective corporate tax rate (τ_{FA}). This time, however, we suppose that τ_{FA} may be less than or equal to zero, since we will consider subsidies paid to foreign affiliates and other benefits in kind linked to output (represented by S_{FA} in equation 2.1). The tax rate threshold for the successful attraction of genuinely productive foreign multinationals (τ_{EP}) may also be negative, as it is partly determined by how low effective corporate tax rates are elsewhere and these rates may be negative for the same reason. The condition for our model economy to host the genuine production of foreign affiliates in the second period is thus

$$\tau_{FA} \leq \tau_{EP}. \tag{2.24}$$

Now the net exports of foreign affiliates represent genuine value added and not shifted profits. Thus, we are back to the general case where $NX_{FA} = \Pi_{FA} + W_{FA}$ and $I_{FA} > 0$. Purely for simplicity, let us suppose that the model economy follows a balanced budget rule, such that $b = 1$. The equilibrium level of income in period two is thus

$$Y_2^* = Y_1^* + \frac{W_{FA} + \tau_{FA}\Pi_{FA} + I_{FA}}{m - \tau_2(1-c)}. \tag{2.25}$$

If $\tau_{FA} > 0$, all three (employment, tax, and investment) channels are in effect and there is an unambiguous increase in the level of income. Note that the any induced government expenditure here is due to taxes collected on the profits connected to genuine production, not shifted profits. If subsidies exceed tax revenue collected from foreign affiliates such that $\tau_{FA} < 0$, then $Y_2^* > Y_1^*$ if

$$|\tau_{FA}| < (W_{FA} + I_{FA})/\Pi_{FA}. \quad (2.26)$$

If we suppose, in analogue with how domestic investment is determined, that foreign affiliate investment increases linearly by a factor of μ with total value added of foreign affiliates

$$I_{FA} = \mu(NX_{FA}) = \mu(\Pi_{FA} + W_{FA}), \quad (2.27)$$

then the growth condition for when $\tau_{FA} < 0$ behind equation (2.26) becomes

$$|\tau_{FA}| < \frac{W_{FA}}{\Pi_{FA}}(1 + \mu) + \mu. \quad (2.28)$$

Equation (2.28) implies there is a limit to how strongly negative the effective rate of tax on foreign affiliates can be while still having a net positive effect on the growth of income. However, especially if $W_{FA} > \Pi_{FA}$, the effective limit on how negative τ_{FA} may be again given by exogenous legal or political constraints rather than this theoretical macroeconomic limit.

2.4 Discussion: Relevance and Implications of the Model

The simple theory offered in the preceding section throws forth a number of implications that may help us assess its relevance and usefulness. First, condition (2.22) suggests that smaller economies are more likely to engage in tax and policy competition. As shown in Woodgate (2020, p.528), this prediction is borne out in the data. Second, condition (2.22) also suggests that the "traditional" tax havens, i.e. those economies with low or zero tax rates on many types of income and not just corporate income, must attract a level of shifted profits that is far greater than the size of the economy in the first period. This appears to be the case in Bermuda, the British Virgin Islands, and the Cayman Islands, for example, which are all economies with no (or a zero-rated) statutory tax on various income streams. Estimates from Tørsløv et al. (2018) indicate the value of shifted profits was over 19 times the value of national income in 2015 in the Cayman Islands and British Virgin Islands and around 5 times national income in Bermuda. Hence, it appears these traditional tax havens may indeed attract a sufficiently high level of shifted profits. Lastly, our tax haven model economy grows through the spending of the part of shifted profits that are taxed at an especially low rate, so it follows that tax havens should have low effective rates of corporate tax, yet high corporate tax revenues. As noted in the introduction, this is indeed the case. For example, company registration fees paid by foreign multinationals make up 56% of total government revenues in the British Virgin Islands[9]. Recent data published by OECD (2020, p. 40) shows that corporate tax paid by foreign affiliates accounts for 65% of total corporate tax receipts in Ireland, 45% in Luxembourg, and 33% in Singapore, as opposed to 7% just on average across Canada, France, Italy, Japan, and the United States.

Our export platform model suggests a large part of employee compensation and investment in particular is due to foreign affiliates. This can also be seen in the data, although proving that the high degree of foreign affiliate activity is caused by state commercialisation and not, say, low wage rates is a difficult and involved task. Nonetheless, data on SEZs in

[9] BVI government finance accounts. Average 2014-16. Ratio of fees from registry of corporate affairs to total government revenue.

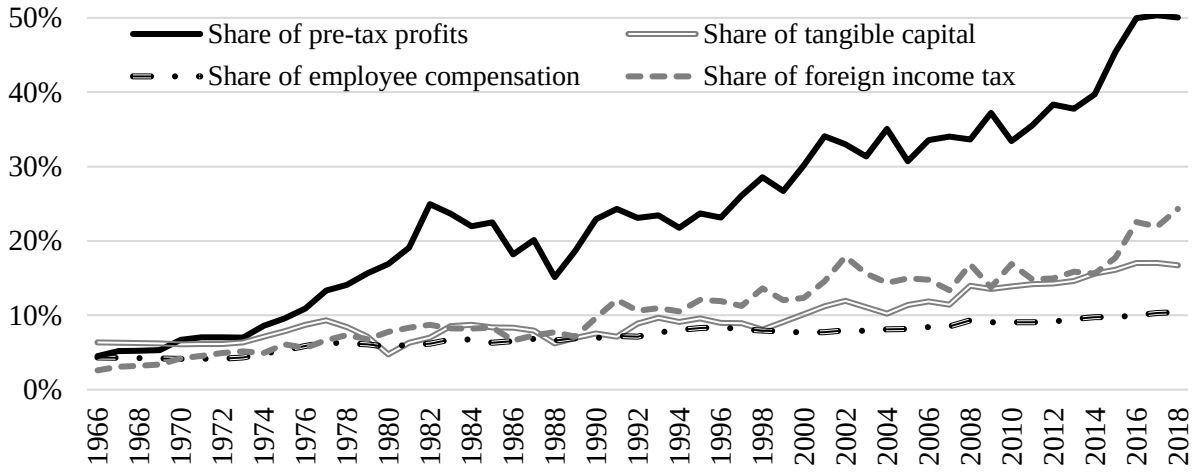
particular may be taken as indicative. Around 80% of cumulative FDI in China and around 60-70% of FDI in Vietnam has taken place in their respective SEZs (UNCTAD 2019, pp.179-181). In Malaysia, 72% of all FDI flowed into SEZs while 83% of exports came from SEZs in 2006 (ADB 2015, pp. 88). The percentage of national exports originating from SEZs was 67% in Sri Lanka (2005), 49% in the Philippines (2011), and 44% in China (2012)[10]. Though indicative, further empirical work is warranted to examine more closely any causal link between state commercialisation and economic performance in these SEZ-dependent countries, as well as the Central and Eastern European countries, which exhibit a high degree of economic activity due to foreign affiliates as well as a high level of state aid (Bohle, 2009, 2018; Drahokoupil, 2009).

2.4.1 Genuine production in tax havens

In this paper, we suppose that tax havens grow exclusively through the taxing and spending of shifted profits. However, a number of modern tax havens appear to benefit to some extent through the productive investment and genuine net exports of foreign affiliates too. As shown in Figure 2.6, the share of worldwide gross profits of US multinationals that are booked in six prominent tax haven economies (Ireland, Luxembourg, the Netherlands, Switzerland, Singapore, and the grouped economy of Bermuda and the Caribbean) soared from 4.5% in 1966 to 50% in 2018. In the same timeframe, the percentage of worldwide foreign income taxes paid by US multinationals in these tax havens grew from 2.6% to 24.3%. From the point of view of our model, this is as expected. Yet, the share of tangible capital and employee compensation going to tax havens has also risen from 6.4% and 4.3% to 16.7% and 10.4% respectively, which, although not as stark an increase as that of gross profits and corporate tax paid, is not insignificant.

What might explain why the employee compensation and tangible investment of foreign affiliates is rising in these tax havens, many of which have relatively expensive labour costs?

Figure 2.6 *Profits, tangible capital, tax and wage bills of non-oil US affiliates in tax havens as a percentage of the respective totals of non-oil US affiliates in all countries*



Sources: Wright & Zucman (2018), BEA (2020)

[10] Data from ADB (2015, pp. 88-90). Years that data refer to determined by data availability.

One likely reason is that multinationals often must prove "economic substance" in order to qualify for particularly low effective tax rates, and so, as Tørsløv et al. (2018, p. 21) suggest, it may simply be "easier for multinationals to shift profits into the countries where they also have sizable real activity". Woodgate (2021a, p.26) shows this is likely the case in Ireland, and argues foreign multinationals have an incentive to locate capital intensive production processes and high-skill, managerial labour in tax havens like Ireland. The cost of doing so will likely be similar to what it would be elsewhere, but locating this kind of business activity in the selected tax haven comes with the benefit of helping prove economic substance to local and foreign tax authorities. These considerations may help explain why modern tax havens appear to be benefiting not just from higher tax revenues, but also from higher rates of employment and tangible investment.

2.4.2 The coordination problem of commercialised state growth strategies

Our model advanced the notion that state aid may be used to spur growth in tax havens and export platforms and explained the channels through which such growth may take place. However, ceteris paribus conditions were imposed throughout, which ought to be relaxed if we are to understand why, in practice, most attempts at the commercialisation of state sovereignty fail. In particular, the thresholds that determine whether an effective rate of tax is low enough for the model economy to establish itself as a tax haven (τ_{TH}) or an export platform (τ_{EP}) within its region may in fact vary between periods. When numerous economies face the same growth conditions seen above and simultaneously engage in the commercialisation of state sovereignty to lure foreign multinationals, these effective threshold rates fall. Hence, while the commercialised state approach may work for one economy alone as we saw above, it will likely not work for many economies following the same strategy at once, as argued in a related model in Woodgate (2020). There is thus a coordination problem, which prevents commercialised state strategies from being effective for those that enact them at the same time as others or after the threshold values have already fallen to some political, legal, or economic minimum.

This theory would therefore predict that early movers in the ensuing race to the bottom in effective rates of tax are the few economies where state commercialising strategies worked. This first-mover advantage issue is well established within the literature on SEZs. Farole (2011, p.249) considers the "entrenched position of 'factory Asia'" as one of main challenges that the more recently established African SEZs inevitably face. Narula and Zhan (2019, p.2) write that "much of the popular understanding of SEZs focuses on examples from [the pre-1990s] period (such as Ireland, India, Malaysia, South Korea and Mauritius)", when multinationals found reliable, export-oriented locations to be in short supply. However, as the authors add, "developing countries in today's global economy that seek to pursue an SEZ-driven approach to development are unlikely to see similar benefits as those countries that followed this approach prior to the 1980s" (ibid.). This sentiment is echoed by ADB (2015, p. 105), who write "numerous [SEZs] have failed—and as we close in on the present—successes have become fewer; no SEZ established since the turn of the century has come close to matching the performance of Shenzhen or of the zones set up in Taipei, China and in Malaysia in the 1970s".

Nonetheless, SEZs continue to be built and policy competition continues to intensify. An explicit example is offered in ADB (2015, p.84), where the super-competitive "X+1"

strategy upheld by SEZs in cities close to Shanghai means that they automatically offer one additional incentive for every new incentive offered by Shanghai. More explicit yet, according to survey of investment promotion agencies found in UNCTAD (2019, p. 191), the number one challenge facing their SEZs is "high competition with neighbouring countries". Hence, it appears the early movers' success with SEZs encouraged emulation elsewhere, but to such an extent that the ensuing competition makes it increasingly difficult for a newly commercialised state to win over foreign multinationals.

Furthermore, most of the havens mentioned in this paper did indeed establish themselves as such at a very early stage. Luxembourg, for example, introduced the concept of the tax-exempt holding company as early as 1929 (Palan, 2009). Switzerland passed its Banking Act of 1934, which established the principle of financial secrecy, one of the "three pillars of the offshore world" (ibid.). Another pillar, "virtual residency", had been ruled lawful by British courts as early as the 1920s, allowing companies across the then British Empire to register in London but pay taxes elsewhere. Combined with the third pillar, "easy incorporation", this precedent helped paved the way for British overseas territories and ex-colonies, especially in the Caribbean, to be used as the ideal location for tax-planning shell companies. By the 1970s, it emerged that the Netherlands had a similar route set up to the Netherlands Antilles (van Dijk et al. 2006, p.15). The commercialisation of the Irish state is exemplified as early as 1956, when 50% of profits resulting from exports were made tax-free, later increased to 100% in 1958. Interestingly, the personal writings of John Costello, the Taoiseach (Irish prime minister) in 1956, suggest he was keenly aware of the tax haven growth strategy described above:

> "I would foresee that if [the exports profits tax relief bill were passed] a great deal of trading would be attracted to Ireland. I would visualise that many English manufacturing concerns would find it worth their while to open businesses, i.e. trading companies in Ireland, and so fix their prices that their real profits or exports were made here to benefit from the favourable rate, and that we would get a lot of extra tax as a consequence." (As quoted in Barry 2011, p. 13).

Due to these kind policies and others, the effective corporate tax rate on US-owned foreign affiliates (not including subsidies or benefits in kind) was as low as 20% in Switzerland, 9% in Singapore, and 2% in Ireland as early as 1984, when the non-haven average was as high as 58% (Wright & Zucman 2018, appendix).

Hence, many of the dominant tax havens and export platforms of today raced to bottom on effective rates of tax before other countries (in the same region) started to do the same—and often long before the era of neoliberal globalisation began in earnest. Newer commercialised states had to contend with a degree of competition not faced by the first movers, reflected in the threshold values of τ_{TH} and τ_{EP} falling ever more quickly and eventually could no longer outcompete the first movers as τ_{TH} and τ_{EP} hit their lower bounds. The embeddedness of each economy in its historical context as seen here should caution policymakers against simply copying the same state commercialising policies in the hope of the same outcomes.

2.5 Conclusion

This paper has argued that the commercialisation of state sovereignty is a defining feature of neoliberal globalisation, which, under the right conditions, may spur economic growth in a quintessentially beggar-thy-neighbour way. The success of commercialised state strategies depends a great deal on the degree of competition between states. Early movers faced little or no competition for the attraction of foreign multinationals and were thus more likely to be successful in boosting demand indirectly (though the tax channel) in tax havens and directly (through net exports and greenfield FDI) in export platforms. The success of the early movers likely lent state commercialising strategies a degree of legitimacy in the eyes of policymakers elsewhere, who then engaged in "competitive emulation" (Palan 1998, p. 639) by offering their own arrays of foreign investment incentives, often through SEZs and IPAs. No doubt, such incentives were also encouraged by lobbying, the strategic interests and behavioural biases of policymakers (Danzman & Slaski, 2021), and objectionable neoclassical capital theory, which supposes the optimal corporate tax rate is zero (Mankiw et al., 2009). Whatever the motivation, such competitive emulation ultimately only served to shift the goalposts concerning how intensely governments must compete in order to attract foreign multinationals (represented in our model by how low τ_{TH} and τ_{EP} are). When commercialised states cannot keep up in the ensuing race to the bottom or can no longer outcompete their rivals at the "bottom", we expect that commercialised state strategies are thus rendered ineffective, as there is little room to entice foreign multinationals away from their entrenched position in early mover economies.

In the beggar-thy-neighbour zero-sum-game of state commercialisation, simultaneous and widespread competition means the surest winners in the race to the bottom are the multinationals and their shareholders, who mostly reside in richer nations. This has important ramifications for inequality and uneven development the world over, as well as stagnant demand and output growth in wage-led economies. Certain policy initiatives designed to curb profit shifting and tax base erosion such as a global minimum corporate tax rate and the imposition of remedial taxes on repatriated corporate profits, which are detailed by researchers like Saez and Zucman (2020, ch. 6) and are gaining traction amongst policymakers in the OECD and G20 (Partington, 2021), are thus to be encouraged. While it makes sense to combat the commercialisation of state sovereignty by focussing on its most egregious form first (i.e. the facilitation of profit shifting), it ought to be followed with international coordination to combat or limit competition for genuine production with other kinds of targeted state aid.

Final remarks concern the main limitations of the modelling approach employed and suggestions for future research. Our model is an analysis of the short run, where prices, wages, and the productive capacity of capital is held constant. Exchange rate effects were also excluded from the analysis, which in reality may prove important, especially in small tax havens with large capital inflows. Productivity and the related spillover effects from foreign affiliates to local firms may also be pertinent to the topic at hand, though were not included here. Future work in this line of research may wish to relax some of these assumptions and extend the analysis of the core elements identified here into the long run.

3. Offshoring via Vertical FDI in a Long-Run Kaleckian Model

Abstract

This chapter develops a two-country Kaleckian model in which "Northern" firms invest a fixed fraction of total investment in foreign affiliates in the low-wage "South" in order to offshore the production of intermediate goods over time and lower overall labour costs. On the back of this setup follows an analysis of the macroeconomic implications of offshoring in the short and long run. Offshoring through vertical FDI is found to lead to a falling wage share and a simultaneously falling price level and rising mark-up in the North, whereas the effect on equilibrium capacity utilisation may be positive or negative. Interestingly, however, regardless of the effect on capacity utilisation and firm profitability, we can show that the structural change implied by offshoring leads to lower rates of capital accumulation and employment in the North relative to the initial (pre-offshoring) values in the short run. The long-run effects on Northern employment and growth, on the other hand, depend crucially on the long-run accumulation rate of the Northern-owned multinational firms. However, the model shows that, if wages endogenously converge during the transition due to higher unemployment in the North and lower unemployment in the South, then the long-run Northern capacity utilisation and accumulation rates are increasingly likely to fall relative to pre-offshoring values. The model appears well suited to shed light on many real-world macroeconomic phenomena, such as rising FDI flows, falling wage shares, rising mark-ups in an era of low inflation, hysteresis, and secular stagnation.

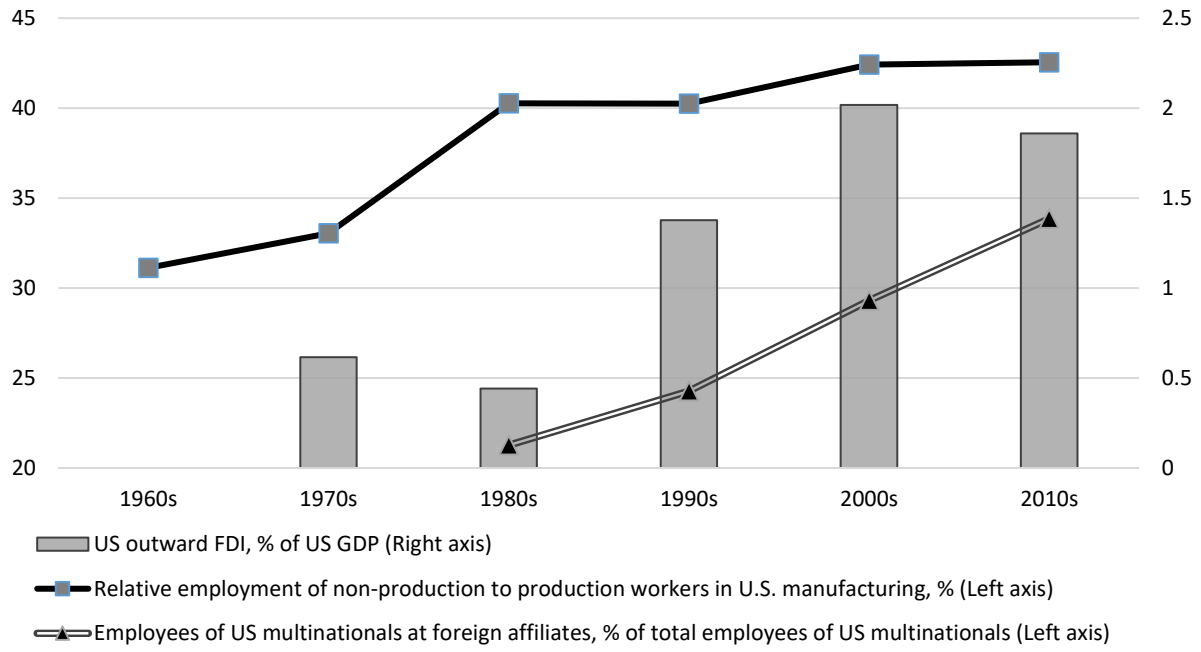
3.1 Introduction

The phenomenal growth of multinational corporations (MNCs) and global production has largely come to define the current era of neoliberal globalisation (Palley 2015, Woodgate 2021b). According to the OECD (2018a, p.6), MNCs were responsible for around half of global trade, a third of global GDP, and a quarter of employment around the world in 2014. Recognition of the size and influence of MNCs in the modern global economy emphasises the need for a post-Keynesian theory of the location of production. While the principle of effective demand may well determine *how much* output and employment takes place, it cannot tell us *where* MNCs decide to locate the resulting production. Seeing as MNCs control a large and growing part of production around the world, the question of location determination becomes all the more pressing.

It would also appear an important undertaking to explain the macroeconomic effects of changes in the location of production, regardless of how such changes in location are determined. The United States, for example, has seen a clear and rising trend, as graphed in Figure 3.1 with data from NBER-CES (2021), in the ratio of non-production workers to production workers in its manufacturing sector since the 1960s, likely in large part due to the offshoring and outsourcing of labour intensive processes to cheaper production locations

(Feenstra 2016). Relatedly, since the 1980s, data from BEA (2021) show a steadily increasing fraction of the total employment of US MNCs has taken place outside of the US. As is also shown in Figure 3.1, using data from the World Bank (2021), these two trends are concurrent to the approximate quadrupling of the ratio of outward FDI to GDP in the US between the 1970s and 2000s. While other factors, such as technological change, likely also contribute to these trends, there is little doubt that offshoring plays an important role.

Figure 3.1 *Offshoring-related employment and outward foreign investment trends in the US (decade averages)*



***Sources**: World Bank (2021), NBER-CES (2021), and BEA (2021) respectively. Author's calculations.*

In addition to concerns about employment, offshoring and footloose production have been linked, to one extent or another, to a raft of important modern macroeconomic puzzles and phenomena by a number of authors. Such phenomena include the decline of the wage share in many countries (Milberg & Winkler 2010, 2013, ch. 5; Guschanski & Onaran, 2021), the flattening or disappearance of the Phillips Curve and below-target inflation (Curr 2019, Setterfield & Blecker 2022), global current account imbalances (Palley 2015), and the decoupling of profits and investment (Milberg & Winkler 2010, Auvray & Rabinovich 2019, Rabinovich 2020). However, much of this work is discursive or empirical, and that which is theoretical is mostly based on partial analysis. A full model is presented by Schröder (2020), which captures some of the macroeconomics effects of offshoring via outsourcing, but this is a short-run model and it does not include foreign investment of any kind. Hence, a long-run, demand-led model, in which offshoring leads to the build-up of productive capacity abroad and which may shed light on the effects of offshoring on distribution, inflation, employment, capacity utilisation, and capital accumulation remains outstanding and should prove to be valuable.

With this motivation in mind, this paper enquires into the macroeconomic implications of firms in one country (the “North”) building up foreign production capacity by investing a fixed fraction of total investment abroad (in the “South”). The result is that, over time, Northern (now multinational) firms have an increasing fraction of their total capital stock located in the

South. In this paper, we refer to this fraction as the "offshoring parameter". In the pre-offshoring period, when this parameter is equal to zero, we assume the Northern and Southern economies are in equilibrium. Then, as the offshoring parameter rises over time, we can observe the effects on key macroeconomic variables and compare them to their pre-offshoring counterparts. The short run is any period where the offshoring parameter can be treated as given, whereas in the long run the offshoring parameter endogenously converges to its upper bound, which we will show is determined by the fraction of total investment going to foreign affiliates abroad.

Here we will suppose the motive behind offshoring is to cut labour costs related to the production of intermediate goods, allowing Northern firms to lower the price of their final good, raise their mark-up, or both. While a sufficiently large wage differential between two countries may be a most obvious determinant of the location of multinational production, it is, of course, not the only one. Tariffs and other taxes, especially corporate taxes, may influence location decisions, as analysed from a post-Keynesian perspective in Woodgate (2020, 2021a, 2021b). Exchange rates and the related monetary policy objectives may also matter, as may financial conditions and a whole host of other factors, such as the skill level of the labour force and so on (Dunning & Lundan 2008, ch. 3-4). However, given the centrality of labour costs in production, it seems especially salient to focus on cross-border wage differentials.

Based on the model developed in this chapter, the basis of which is essentially post-Kaleckian, we arrive at a number of interesting conclusions. First, offshoring is found to lead to a falling wage share as well as, in the general case, a falling price level and a rising mark-up in the North. Special cases, similar to Schröder (2020), with either a constant mark-up or a constant price level, are also entertained. The effect of offshoring on equilibrium capacity utilisation may be either negative or positive depending on the size of the effects on unit gross profits, which boost investment and hinders consumption, and on net exports, which are boosted by increased price competitiveness but hindered by higher imported inputs. However, contrary to a typical post-Kaleckian model, we find that the Northern accumulation and employment rates may still be below their pre-offshoring counterpart values in the short run, even if offshoring has a positive effect on capacity utilisation and profitability in the North. The lower growth and employment rates, in this scenario, are a result of the structural change implied by offshoring, which essentially represents a negative shock to the Northern economy and a positive shock to the Southern economy. Moreover, even if the accumulation rate in the Northern economy recovers to its pre-offshoring rate in the long run, we can observe hysteresis in the capital stock. The long run effects on the Northern and Southern accumulation and employment rates are found to depend crucially on the effect of offshoring on the MNCs' accumulation rate. Though, if we allow for wages to react endogenously to changes in employment rates, then Northern capacity utilisation and unit gross profits are likely to shrink, increasing the likelihood of stagnation tendencies in the North in the long run.

With these results in mind, the model seems well suited to shed light on some important modern macroeconomic trends seen across many advanced economies, such as falling wage shares, low and stable inflation rates, hysteresis, and secular stagnation. While the focus in this paper is on the FDI outflow country (the "North"), we also note how growth and employment is boosted in the FDI recipient country (the "South") in the short run and possibly in the long run too, which may also help explain the growth experiences of certain emerging economies.

The chapter proceeds by discussing some of the related literature in section 3.2. As there is not much model theoretical work on the topic of offshoring from a post-Keynesian

perspective, this short part mainly summarises the approach and results of Schröder (2020), though, different to Schröder, we do so by employing a more standard neo-Kaleckian model and by introducing offshoring in a more mathematically tractable way. Since Schröder (2020) contains what is essentially a model of offshoring via outsourcing in the short run, we argue that to bring the analysis into the long run, we must allow for the accumulation of a foreign capital stock, since firms would rather avoid the fundamental uncertainty that arises from outsourcing to third-party firms in the long run. Section 3.3 presents our long-run model of offshoring and its findings, and, finally, section 3.4 concludes with a brief discussion of the relevance, implications, and limitations of this model.

3.2 Related literature: Offshoring via outsourcing in the short run

Schröder (2020) is one of the few papers published to date—if not the only one—that formally models the effects of offshoring in a post-Keynesian model. The author, somewhat ambiguously, refers to his model as a "standard Keynes-Kalecki model" (p. 181). In essence, however, it is very similar to a kind of short-run, open-economy variant of the neo-Kaleckian model given Schröder's assumptions regarding, for example, mark-up pricing and wage-led demand. Indeed, it will be shown here that by employing a more standardised neo-Kaleckian model expressed in levels and by representing offshoring in a more straightforward way, we can arrive at the essence of Schröder's results in a very concise manner without, it is hoped, any undue loss. Doing so will also nicely motivate and contextualise the long-run model developed in this paper in the next section.

3.2.1 An alternative exposition of the results of Schröder's (2020) model

We begin our exposition of Schröder's results with the price level (p) equation, where prices are determined by a mark-up (m) on unit variable costs (UVC), which are comprised of unit direct labour costs (ULC) and unit material costs (UMC). The former can be written as the product of the nominal wage rate (w) and the unit labour requirement (a) and the latter as the product of the import price (p_m) and the unit import requirement (μ):

$$p = (1+m)UVC = (1+m)(ULC + UMC) = (1+m)(wa + p_m\mu). \tag{3.1}$$

Here we are assuming that all material inputs are imported from abroad. As in Hein (2014), we denote the ratio of unit material costs to unit labour costs by

$$z = \frac{p_m\mu}{wa}, \tag{3.2}$$

and can therefore express the profit share (h) in gross value added, where the latter is the sum of the wage bill (W) and the profit level (Π), as follows:

$$h = \frac{\Pi}{W+\Pi} = \frac{mwa(1+z)}{wa + mwa(1+z)} = \frac{1}{1+\frac{1}{m(1+z)}}. \tag{3.3}$$

Any increase in the mark-up or the ratio of unit material costs to unit labour costs has an unambiguously positive effect on the profit share.

Schröder (2020) introduces offshoring as a kind of labour-saving and import-using technical change, represented by a decrease in the unit labour requirement, a, and an increase in the unit import requirement, μ. This reflects the fact that as more production is offshored, less variable labour is required domestically as it is embodied in the greater quantity of intermediate goods that are imported. Unlike Schröder (2020), however, who analyses concurrent but separate changes in the unit import requirement and the unit labour requirement, here we find it simpler to represent Schröder's notion of offshoring technical change (ζ) by the *ratio* of the former to the latter:

$$\zeta \equiv \frac{\mu}{a} = \frac{M_{IG}}{L}. \tag{3.4}$$

Since ζ can be reduced to the ratio of imported input goods (M_{IG}) to domestic labour employed, we can call this the "import-per-worker requirement". Doing so will also help us distinguish this notion of offshoring from the one to be introduced later, which we will simply call the offshoring parameter.

Clearly, increases in the import-per-worker requirement have a positive effect on the ratio of unit material costs to unit labour costs (z), as can be seen in equation (3.2). As Schröder (2020) also points out, an increase in offshoring may also positively affect the mark-up by weakening labour's bargaining power, via the direct effect of lower domestic employment or via the "threat effect", where wage demands are tempered by workers' fear that higher wages will lead to their jobs being moved abroad (e.g. Milberg & Winkler, 2010, p. 279). In the approach we take here, it is straightforward to show that the effect of offshoring on the gross profit share is unambiguously positive:

$$\frac{\partial h}{\partial \zeta} = \frac{\frac{\partial m}{\partial \zeta}(1+z) + \frac{p_m}{w}m}{[1+m(1+z)]^2} > 0 \qquad \frac{\partial m}{\partial \zeta} \geq 0. \tag{3.5}$$

In the context of the wage-led model that Schröder (2020) employs, an increase in the profit share can only dampen private domestic demand. This follows if we employ the conventional functional forms for the levels of saving (S) and investment (I), given in equations (3.6) and (3.7) respectively. Unlike Schröder (2020), we model saving explicitly rather than consumption, impose the simplifying assumption that workers do not save, and employ a neo-Kaleckian investment function, where firm profitability has no direct effect on investment.[11]

$$S = s_\pi h Y \tag{3.6}$$

$$I = i_A + i_Y Y \tag{3.7}$$

Equation (3.6) shows that saving is seen as a function of the propensity to save out of profits (s_π), the profit share, and the level of output. Investment, given by equation (3.7), is determined by an autonomous part that supposedly reflects animal spirits (i_A) and by an induced part, where i_Y is the responsiveness of investment to changes in output. From this setup it is clear that increases in the profit share caused by an increase in the offshoring parameter reduce

[11] Schröder (2020) allows profits to have a positive effect on investment under the assumption that the effect of profits on consumption and investment is smaller than the effect of the wage bill on consumption, i.e. domestic demand is wage-led by assumption. We reach the same qualitative result here by simply employing the neo-Kaleckian investment function.

consumption (increase saving) without any compensating effect on investment, and so domestic demand is clearly negatively affected by offshoring.

Thus, according to Schröder's approach, total private demand—and thereby output and employment—can only be positively affected if the effect of offshoring on net exports is positive enough to compensate for the negative effect on domestic demand. Again adopting a fairly standard modelling approach, let us suppose net exports depend negatively on domestic output, and positively on foreign output (Y_f) and the real exchange rate (e^R), where the latter is the ratio of foreign prices (p^f) expressed in domestic currency units using the nominal exchange rate (e) to domestic prices ($e^R = e * p^f/p$). The coefficients n_e, n_x, and n_m are treated as exogenously given and represent the responsiveness of net exports to the real exchange rate, foreign output, and domestic output respectively.

$$NX = n_e e^R + n_x Y_f - n_m Y. \tag{3.8}$$

Offshoring influences the indicator of international price competiveness, namely the real exchange rate, through its effects on domestic prices. On this matter, Schröder (2020, p.189) supposes that "offshoring is viable only if it leads to a fall in unit [variable] costs".[12] However, offshoring may also lead to an increase in mark-ups, leaving the effect on the price level and thus on the real exchange rate ambiguous, at least in an a priori theoretical sense. Given this, Schröder allows for two alternative closures to his model: One with constant prices and the other with a constant mark-up. Given constant prices, offshoring leads to higher profitability through a higher mark-up and the real exchange rate is left unaffected ($\partial e^R/\partial\zeta = 0$). Given a constant mark-up, offshoring allows for a more internationally competitive price of domestically produced goods, implying a positive effect on the real exchange rate $\partial e^R/\partial\zeta > 0$). It is this second case, where prices fall given an increase in offshoring, that is necessary for total private demand to be boosted by offshoring.

In sum, then, the equilibrium condition

$$S = I + NX \tag{3.9}$$

is satisfied at the equilibrium level of output (Y^*)

$$Y^* = \frac{i_A + n_e e^R + n_x Y_f}{s_\pi h + n_m - i_Y}, \tag{3.10}$$

where the usual Keynesian stability condition is assumed to hold such that the denominator in equation (3.10) is positive. The effect of offshoring on equilibrium output is therefore

$$\frac{\partial Y^*}{\partial\zeta} = \frac{n_e \frac{\partial e^R}{\partial\zeta} - s_\pi Y^* \frac{\partial h}{\partial\zeta}}{s_\pi h + n_m - i_Y} \tag{3.11}$$

Hence, we arrive at the Schröder's (2020, p.179) result regarding the effect of offshoring on demand, output, and employment: "If higher markups absorb the competitiveness gain … offshoring unambiguously reduces [total private] demand and employment. If the markup

[12] Arguably, however, one could conceive of a firm that decides to engage in offshoring even if unit variable costs do not fall. For example, a firm that wishes to increase its mark-up by reducing labour union power may decide to offshore production even if a fall in unit labour costs does not result.

remains constant, the net effect of offshoring on [total private] demand and employment is ambiguous; it depends crucially on the price elasticity of exports." Restated with the use of the simplified model presented here, in the former case, $\partial e^R/\partial\zeta = 0$ and equation (3.11) is clearly negative. In the latter case, $\partial e^R/\partial\zeta > 0$ and the effect of offshoring on demand, output and employment depends on whether the increase in net exports ($n_e[\partial e^R/\partial\zeta]$) is large enough to compensate for the fall in consumption ($s_\pi Y^*[\partial h/\partial\zeta]$).

3.2.2 From a short-run, static model of outsourcing to a long-run, dynamic model of offshoring

As insightful as the approach taken in Schröder (2020) is, the main limitations ought to be stressed. Firstly, it is more specifically a model of *offshore outsourcing*, whereby domestic firms are increasingly reliant upon foreign, *external* firms for intermediate goods. The question of what happens if domestic firms engage in *in-house offshoring*, where domestic firms establish foreign affiliates through foreign direct investment (whether in the form of greenfield investment or through merging with or acquiring a foreign firm), is not addressed.[13] Secondly, and very much relatedly, it is a short-run static model rather than a long-run dynamic one. For the reasons to be outlined below, firms may be more likely to engage in in-house offshoring rather than offshore outsourcing in the long run, and this is likely to have a number of important macroeconomic implications. Third, offshoring may have a number of further effects on aggregate demand that have hitherto not been considered. For example, profit-led domestic demand could be incorporated, which would seem important, since higher profits resulting from offshoring may, in principle, spur domestic investment to a greater extent than any fall in consumption.[14] Lastly, all else being equal, a greater degree of in-house offshoring may increase foreign income and decrease domestic income as revenue generated by domestic firms increasingly flows out of the domestic economy to pay foreign workers. The induced changes in income may have implications for net exports, as we will see.

Before moving on to the model, it is worth briefly elaborating on why, from a post-Keynesian perspective, it is quite unreasonable to suppose that oligopolistic firms engage exclusively in offshore outsourcing in the long run. Without a sufficient degree of control over the suppliers of crucial input goods, domestic firms that outsource production to foreign firms effectively increase the degree of fundamental uncertainty they face. This is contrary to what is widely considered within post-Keynesian economics to be one of the main objectives of the firm, namely *power*. For example, it is the view of Lavoie (2014, p. 128) that, "power is the ultimate objective of the firm: power over its environment, whether it be economic, social or political", including "power over [a firm's] suppliers of materials". Given that firms want to increase their degree of power or decrease their exposure to fundamental uncertainty, it is no wonder that offshoring largely takes place through M&A or greenfield FDI flows that establish control in the foreign location of production. Firms that engage purely in outsourcing, whether through contract manufacturing or simply buying the output of third-party firms, face

[13] For a more elaborate definition of offshoring and its various distinctions, see OECD (2007).

[14] This point is mentioned elsewhere in the literature, such as in Milberg & Winkler (2010) and Auvray & Rabinovich (2019), however, these authors argue that financialisation redirects the increased profits from offshoring away from investment and towards shareholder value maximisation. While we take no issue with that explanation and its empirical relevance for many countries, it would be interesting, nonetheless, to understand whether the process of offshoring alone could lead to higher profits and lower domestic investment without invoking financialisation.

undesirable dependency and uncertainty in the long run, however profitable it may be in the short run. Indeed, by absorbing the profit margin of supplier firms through vertical integration, in-house offshoring may be the more profitable option in the long run as well, regardless of the desire to minimise exposure to fundamental uncertainty. But even if the required input or intermediate goods are low-profit, primary goods, it may still be worth ensuring the production of such goods remains (or becomes) in-house because, as John Kenneth Galbraith (1967, p.45-46) puts it, "to have control of supply—to not rely on the market but its own sources of supply—is an elementary safeguard".[15]

As we already saw in Schröder's (2020) model, and has been described in detail elsewhere in the literature (e.g. Milberg 2006, Milberg and Winkler 2013, ch.4), offshoring implies a kind of cost cutting. Cutting variable (especially labour) costs allows for higher mark-ups without higher prices, lower prices without lower mark-ups, or some lesser degree of both lower prices and higher mark-ups simultaneously. In the model to be developed here, we will allow for the general case of lower prices and higher mark-ups, alongside the two extreme cases of constant mark-ups or constant prices seen above.

3.3 Model

3.3.1 Setup and assumptions

Consider a two-country model of North and South, where the nominal wage rate in the former (w_N) is higher than that of the latter (w_S) when converted into Northern currency units by the nominal exchange rate (e). We will define the difference between the wages rates as

$$w_\Delta = w_N - ew_S > 0. \tag{3.12}$$

Throughout most of this paper, we will consider these variables to be exogenously given and fixed. Also, suppose that the two economies are in equilibrium in period $t = 0$ before any offshoring of Northern firms' production occurs in period $t \geq 1$. Importantly, in this paper, we are only considering the case where Northern firms are engaged in offshoring to avail of cheaper labour in the South. Southern firms do not offshore any production at any point. In this paper, all output of foreign affiliates is exclusively used by Northern domestic firms as inputs into the production of Northern final goods.

After offshoring begins, Northern firms (which are now multinational firms) have a total of capital (K), labour (L), output (Y), and potential output (Y^P) which is located in either the North (denoted by a subscript *N*) or at foreign affiliates in the South (denoted by a subscript *FA*), such that

$$Z_t = Z_{N,t} + Z_{FA,t}, \text{ where } Z = L, K, Y, or\ Y^P. \tag{3.13}$$

[15] Indeed, as Dunn (2005) argues, the theory of the firm advanced by John Kenneth Galbraith, grounded in uncertainty, power, and planning, helps explain why multinational corporations emerged in the first place.

Total labour, capital, output and potential output in the South is thus the sum of each variable at the Northern-owned foreign affiliates and at Southern-owned, non-affiliates (denoted by a subscript *NA*) in any time period *t*:

$$Z_{S,t} = Z_{NA,t} + Z_{FA,t}, \text{ where } Z = L, K, Y, or\ Y^P. \tag{3.14}$$

Note that, before offshoring,

$$Z_{FA,0} = 0 \quad \rightarrow \quad Z_0 = Z_{N,0} \text{ and } Z_{S,0} = Z_{NA,0} \text{ where } Z = L, K, Y, or\ Y^P. \tag{3.15}$$

Let us now introduce some simplifying assumptions about the nature of the MNCs' production at home and at their foreign affiliates. We will suppose that the capital-potential output ratio ($v = K_t/Y_t^P$) and the unit labour requirement ($a = L_t/Y_t$) are the same at home and abroad and do not change over time:

$$v_N = v_{FA} \text{ and } a_N = a_{FA}. \tag{3.16}$$

We assume that the capital intensity ($k_t = K_t/L_t$) is the same at home and at the foreign affiliates, though may vary over time in response to changes in demand:

$$k_{N,t} = k_{FA,t}. \tag{3.17}$$

Of course, these assumptions are large simplifications.[16] In the real world, it is likely the case that low-skilled, labour intensive tasks are the first to be offshored. That being said, given the fact that a long-run Kaleckian model of offshoring has not been hitherto attempted, it seems natural to start with the simplest case before introducing extensions that may better reflect reality as we know it. Moreover, a very general—and thus very useful—notion of offshoring can be introduced based on these assumptions.

Let us define the offshoring parameter (θ_t) by the ratio of the capital stock held at the foreign affiliates to the northern firms' total capital stock,

$$\theta_t \equiv \frac{K_{FA,t}}{K_t}. \tag{3.18}$$

Notice that given our assumptions, this offshoring parameter is also equal to the ratio of labour, output, and potential output at the foreign affiliates to the MNCs' overall labour, output, and potential output respectively:

$$\theta_t = \frac{K_{FA,t}}{K_t} = \frac{L_{FA,t}}{L_t} = \frac{Y_{FA,t}}{Y_t} = \frac{Y_{FA,t}^P}{Y_t^P}. \tag{3.19}$$

Hence, it is rather arbitrary how we initially define the offshoring parameter since the assumptions imply all of the ratios in equation (3.19), which could each be thought of as reflecting the degree of offshoring, are one and the same.

[16] Since productivity is the same abroad as at home but labour is cheaper abroad, one may wonder why Northern firms do not simply offshore *all* production. In fact, our model does not preclude the possibility. However, it is worth keeping in mind that time and finance constraints as well as fundamental uncertainty and perceptions of risk and affect the degree and pace of offshoring. Endogenous wages, as we will see in the final part, may also present a reason to not offshore all production, as might a number of other factors not considered here, such as productivity differentials, transport costs, the natural geography of resources, and political or regulatory responses.

Besides the convenient representation of offshoring in our model, the assumptions above imply three further corollaries. First, it must be the case that the domestic and foreign affiliates' technical parameters are equal to the multinationals' overall technical parameters:

$$v_N = v_{FA} = v, \quad a_N = a_{FA} = a, \quad \text{and} \quad k_{N,t} = k_{FA,t} = k_t. \tag{3.20}$$

Second, we can now make the connection between the offshoring parameter and the import-per-worker requirement (ζ) introduced above. As the production of intermediate goods moves offshore and are thus imported from foreign affiliates such that $M_{N,t}^{IG} = Y_{FA,t}$, it follows that

$$\zeta_t = \frac{M_{N,t}^{IG}}{L_{N,t}} = \frac{\theta_t Y_t}{(1-\theta_t)L_t} = \frac{\theta_t}{(1-\theta_t)a}. \tag{3.21}$$

Clearly, the import-per-worker requirement rises with the offshoring parameter. Lastly, it follows from this setup that the multinational's overall capacity utilisation ($u_t = Y_t/Y_t^P$) is equal to that of its domestic affiliates ($u_{N,t} = Y_{N,t}/Y_{N,t}^P$) and foreign affiliates ($u_{FA,t} = Y_{FA,t}/Y_{FA,t}^P$)

$$u_{N,t} = u_{FA,t} = u_t. \tag{3.22}$$

Now we are ready to describe how offshoring is brought about. Of course, given the type of offshoring we are interested in, Northern firms must invest abroad to engage in offshoring. Northern firms' total investment (I_t) is thus split between the North ($I_{N,t}$) and foreign affiliates in the South ($I_{FA,t}$), such that

$$I_t = I_{N,t} + I_{FA,t}. \tag{3.23}$$

In order to offshore a desired fraction of its workforce in the long run, Northern firms locate a fraction of annual investment in foreign affiliates in the South ($\phi \equiv I_{FA,t}/I_t$). Assuming this foreign fraction of total investment (ϕ) is constant over time, it follows that

$$\theta_t = \frac{K_{FA,t}}{K_t} = \frac{\sum_{i=1}^{t} \phi I_i}{K_t} = \frac{\phi \sum_{i=1}^{t} I_i}{K_t} = \frac{\phi(K_t - K_0)}{K_t} = \phi\left(1 - \frac{K_0}{K_t}\right), \tag{3.24}$$

where K_0 is Northern firms' total capital stock before offshoring starts in period $t = 1$. Since K_0 is a constant and K_t has no upper bound, it follows that the offshoring parameter tends to the foreign investment ratio in the long run. Viewed another way, we know that the offshoring parameter must be constant in the long run, such that the growth rate of the offshoring parameter

$$\widehat{\theta_t} = \widehat{K_{FA,t}} - \widehat{K_t} = g_{FA,t} - g_t = \frac{I_{FA,t}}{K_{FA,t}} - \frac{I_t}{K_t} = \frac{\phi I_t}{\theta K_t} - \frac{I_t}{K_t} = g_t\left(\frac{\phi}{\theta} - 1\right), \tag{3.25}$$

must tend to zero in the long-run equilibrium. Therefore, in the long run, under the usual ceteris paribus conditions, the offshoring parameter must tend to the foreign investment ratio,

$$\theta^{LR} \to \phi. \tag{3.26}$$

Offshoring has important implications for the growth rates of the multinationals' total capital stock (g), the Northern capital stock (g_N), foreign affiliate capital stock (g_{FA}), and Southern capital stock (g_S). For convenience, we now omit the time subscript, t. The growth

rate of the MNCs' total capital stock will be determined by the usual post-Kaleckian determinants, namely exogenously determined animal spirits (γ), capacity utilisation as an indicator of demand, and unit gross profits (π)

$$g = \gamma + \gamma_u u + \gamma_\pi \pi, \tag{3.27}$$

where γ_u and γ_π are the exogenously given coefficients that reflect the responsiveness of the accumulation rate to changes in capacity utilisation and unit gross profits respectively.

The growth rate of the Northern capital stock is

$$g_N = \frac{I_N}{K_N} = \frac{(1-\phi)I}{(1-\theta)K} = \frac{(1-\phi)}{(1-\theta)}\, g, \tag{3.28}$$

and that of the foreign affiliate capital stock is

$$g_{FA} = \frac{I_{FA}}{K_{FA}} = \frac{\phi I}{\theta K} = \frac{\phi}{\theta} g. \tag{3.29}$$

Hence, the growth rate of the Northern capital stock may be affected by offshoring through three channels: Through the demand channel ($\partial u/\partial\theta$), the profitability channel ($\partial\pi/\partial\theta$), or through what we will call the offshoring channel, reflected in the term $(1-\phi)/(1-\theta)$. While the first two channels are common to any post-Kaleckian model, the offshoring channel is unique to this one and arises because Northern firms may choose to locate a part of productive capacity outside of the North. In the short run, we know $\theta < \phi$ and so it must be that $g_N < g$ and $g_{FA} > g$. In the long run, however, $\theta = \phi$, and so $g_N = g_{FA} = g$. In order to understand whether the long-run growth rate in the North is higher or lower than the pre-offshoring growth rate, we will need to understand how offshoring affects profitability and aggregate demand.

3.3.2 Prices and distribution

Suppose Northern firms produce their own intermediate goods in the North before offshoring commences. Assuming the price level in the North (p_N) is determined by a mark-up (m_N) on unit labour costs, which is the product of the Northern wage rate and the unit labour requirement, we arrive at a familiar expression for the price level

$$p_N = (1 + m_N) a w_N, \tag{3.30}$$

and for the nominal value of Northern output ($p_N Y_N$):

$$p_N Y_N = (1 + m_N) L_N w_N, \tag{3.31}$$

Since we are assuming that the technical conditions (a and v) are the same across production of intermediate goods and final goods, changes in the relative quantity of labour used in intermediate good production and final good production do not affect the price or nominal value of total output. However, once offshoring begins, unit labour costs will fall since workers at foreign affiliates in the South are paid a lower wage rate. We will assume throughout that transport costs are negligible. The nominal value of Northern output is now

$$p_N Y_N = (1 + m_N)(w_N L_N + e w_s L_{FA}) = (1 + m_N) L (w_N (1 - \theta) + e w_s \theta). \quad (3.32)$$

Here an implicit but important assumption has been made, namely that Northern firms—now MNCs—do not apply a mark-up upon intermediate goods twice. Again to keep matters simple, this is achieved by assuming that foreign affiliates under Northern control export intermediate goods at cost price, such that the nominal value of intermediate goods ($p_{FA} Y_{FA}$) is equal to total labour costs at the foreign affiliate[17]

$$e p_{FA} Y_{FA} = e w_s L_{FA} \quad \rightarrow \quad p_{FA} = \frac{w_s L_{FA}}{Y_{FA}} = w_s a. \quad (3.33)$$

Hence, prices are now a function of the average wage rate across the two countries, weighted by the fraction of labour employed abroad, i.e. by the offshoring parameter. Putting this more explicitly in terms of the offshoring parameter, the Northern price level is given by

$$p_N = (1 + m_N) a (w_N - \theta w_\Delta). \quad (3.34)$$

Recall that, by construction, $w_\Delta = w_N - e w_S > 0$, so an increase in offshoring must lead to a lower Northern price level if the mark-up is unchanged. However, the mark-up is likely to increase in response to increased offshoring of production for at least three reasons. First, as mentioned above, offshoring weakens labour bargaining power as firms can credibly threaten to relocate many aspects of production in the face of higher wage demands (Bronfenbrenner 2000; Milberg & Winkler 2010). Second, total overhead costs will likely increase, as the overhead costs at the foreign affiliate (rent, managerial labour, etc.) must be covered by the multinational firms' overall mark-up. Third, offshoring reflects a shift from price competition to cost competition, whereby a firm that can reduce unit costs through offshoring to a greater extent than rival firms can enjoy higher unit gross profits at the same price level as its competitors. In the words of Milberg (2006, p.3), "U.S. firms have successfully used global production networks to reduce costs and raise markups without pushing up final goods and services prices. The concern with cost control as opposed to prices *per se* constitutes a shift in firm strategy."

With these arguments in mind, we will suppose that the reduction in overall unit labour costs due to offshoring may lead to a higher mark-up but not to higher prices. This is similar to the approach found in Schröder (2020), where two scenarios are analysed, one of a constant mark-up (and thus falling prices) and one of a constant price (and thus rising mark-up). However, here we will also allow for intermediate effects of both an increase in the mark-up and a fall in the price. We can analyse the interactions between increased offshoring, a falling price level, and a rising mark-up in the following way. Differentiating equation (3.34) with respect to the offshoring parameter and ensuring that it is always less than or equal to zero

[17] Alternatively, one can allow the foreign affiliate to apply the northern mark-up upon foreign affiliate unit labour costs and arrive at much the same outcome, so long as the mark-up is not applied a second time in the North. The main difference would then be that the model would have to account for net income receipts in the form of repatriated profits. Apart from this, the outcomes to be described in this paper are essentially the same, hence the more convenient notion that the foreign affiliate prices its output (i.e. the intermediate good) at cost price. Lastly, note that, by applying the mark-up only in the second stage of production in the North, the Northern multinationals are essentially engaged in profit shifting. In reality, this would have implications for tax revenues and public policy, but it does not matter for our purposes since our model does not include a government sector.

$$\frac{\partial p_N}{\partial \theta} = a\left[\frac{\partial m_N}{\partial \theta}(w_N - \theta w_\Delta) - w_\Delta(1 + m_N)\right] \leq 0, \tag{3.35}$$

implies an upper bound for the effect of offshoring on the Northern mark-up

$$\frac{\partial m_N}{\partial \theta} = \frac{(1 + m_N)w_\Delta}{w_N - \theta w_\Delta}\rho, \tag{3.36}$$

where $0 \leq \rho \leq 1$. The parameter ρ reflects the extent to which a greater degree of offshoring leads to a higher mark-up rather than lower prices. For example, when $\rho = 1$, the gains from offshoring are completely absorbed into higher gross profits while the price stays the same. When $\rho = 0$ there is no effect on the mark-up and prices fall to their greatest extent. Values of ρ between these two extremes of a constant price or a constant mark-up represent all the possible intermediate cases.

Moving on to matters of distribution, the wage share of national income in the North (ω_N) is given by

$$\omega_N = \frac{L_N w_N}{L_N w_N + m_N(L_N w_N + L_{FA} e w_S)} = \frac{1}{1 + m_N(1 + \frac{\theta e w_S}{(1-\theta)w_N})}. \tag{3.37}$$

The effect of offshoring on the wage share is thus unambiguously negative

$$\frac{\partial \omega_N}{\partial \theta} = \frac{-\left[\frac{\partial m_N}{\partial \theta}\left(1 + \frac{\theta e w_S}{(1-\theta)w_N}\right) + m_N \frac{e w_S w_N}{[(1-\theta)w_N]^2}\right]}{\left[1 + m_N\left(1 + \frac{\theta e w_S}{(1-\theta)w_N}\right)\right]^2} < 0. \tag{3.38}$$

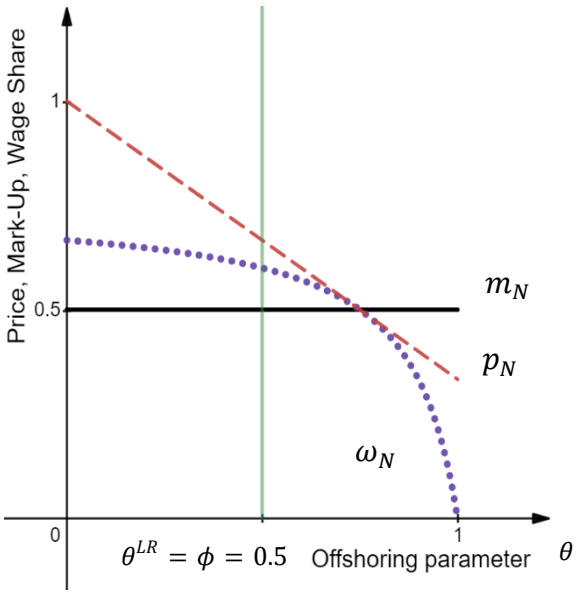
Note that, by equation (3.21), we know that the ratio of unit material costs to unit labour costs, denoted in the previous section by z, must rise with increases in offshoring parameter.

By solving the differential equation (3.36) for the Northern mark-up, we get

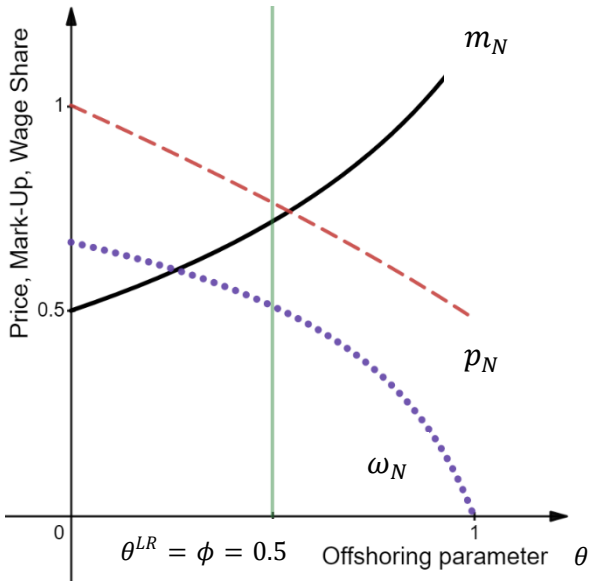
$$m_N = \frac{(m_0 + 1)(w_N)^\rho}{(w_N - \theta w_\Delta)^\rho} - 1, \tag{3.39}$$

where m_0 is the mark-up before offshoring. We can use equation (3.39), alongside equations (3.37) and (3.34), to observe the responses of Northern mark-up, wage share of income, and price level to increases in the offshoring parameter, as is done in Figure 3.2. Since the gradient of the curves depend on the value of ρ, four example cases are offered in the four panels, where ρ initially at zero (implying a constant mark-up) and increases to one (which implies a constant price level) by one third in each panel. For the purposes of illustration, the unit labour requirement, a, and wage differential, w^Δ, are set such that the initial (i.e. pre-offshoring) values of the price level, wage share, and mark-up are $p_0 = 1$, $\omega_0 = 2/3$, and $m_0 = 0.5$ respectively. As before, the long-run value of the offshoring parameter is determined by the foreign share of total investment, ϕ, which for the sake of illustration is set equal to 0.5 here. Clearly, the higher the value of ρ, the lower the value of the wage share, the higher the value of the mark-up, and the smaller the decrease in the price level for any given value of the offshoring parameter.

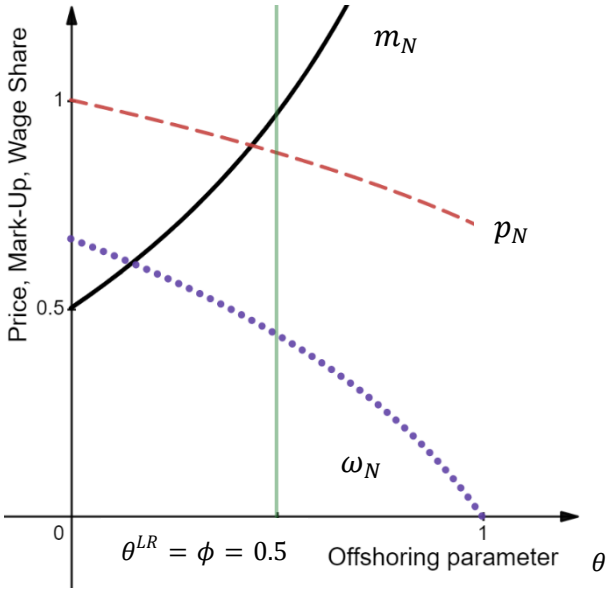
Figure 3.2 *Effect of offshoring on the price level, mark-up, and wage share in the North*



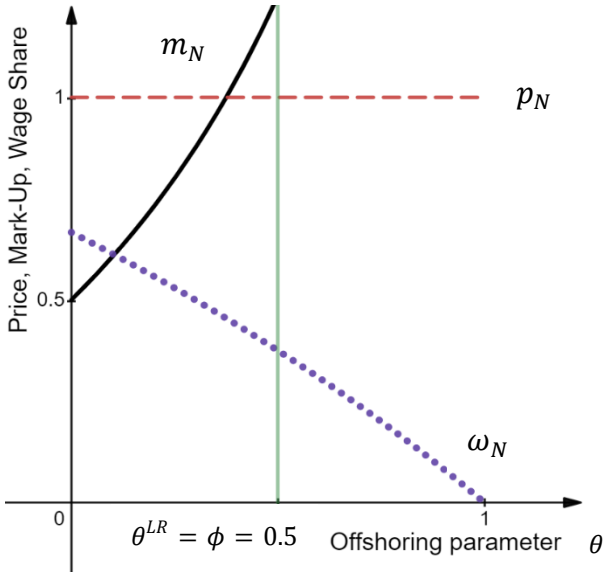
Panel 3.2A $\rho = 0$



Panel 3.2B $\rho = 0.33$



Panel 3.2C $\rho = 0.66$



Panel 3.2D $\rho = 1$

Given the presence of intermediate goods in our model, it follows that the profit share is not generally equal to unit gross profits (π_N), where the latter is given by

$$\pi_N = \frac{\Pi_N}{p_N Y} = \frac{m_N}{1 + m_N}. \tag{3.40}$$

Indeed, it can be shown that the profit share is greater than unit gross profits for all positive values of the offshoring parameter, i.e.

$$1 - \omega_N > \pi_N \qquad \forall\, \theta > 0. \tag{3.41}$$

Unit gross profits increase in response to increases in the offshoring parameter, such that

$$\frac{\partial \pi_N}{\partial \theta} = \frac{\partial m_N/\partial \theta}{(1+m_N)^2} = \frac{w_\Delta \rho}{(1+m_N)(w_N - \theta w_\Delta)}. \tag{3.42}$$

The effect of offshoring on the North's international price competiveness—captured, as before, in the real exchange rate—is the last effect to be considered before we move on to consider the effects on aggregate demand. Assuming offshoring does not affect the nominal exchange rate nor the prices of non-affiliated firms in the south, we arrive at

$$\frac{\partial e_N^R}{\partial \theta} = -\frac{e p_{NA}}{{p_N}^2}\frac{\partial p_N}{\partial \theta} = \frac{e^R w_\Delta (1-\rho)}{(1+m_N)(w_N - \theta w_\Delta)}. \tag{3.43}$$

Reflected in equations (3.42) and (3.43) is the simple fact that if offshoring has no effect on prices and a maximum effect on the mark-up such that $\rho = 1$, the effect of offshoring on unit gross profits will be at its greatest while there will be no effect on international price competitiveness. Of course, if $\rho = 0$, the opposite is true.

3.3.3 Effective demand

The accumulation rate in the North has already been determined and is given in equations (3.27) and (3.28). Hence, we will need to determine the saving rate ($\sigma_N = S_N/p_N K_N$) and the net export rate ($b_N = NX_N/p_N K_N$) before we can examine the conditions under which the Northern economy comes into equilibrium, which is given by

$$\sigma_N = g_N + b_N. \tag{3.44}$$

The saving rate is a rather straightforward matter, and is given by

$$\sigma_N = \frac{s_\pi \Pi}{p_N K_N} = s_\pi \frac{\Pi}{p_N Y}\frac{Y}{Y^P}\frac{Y^P}{K(1-\theta)} = \frac{s_\pi \pi u}{v(1-\theta)}. \tag{3.45}$$

Again, we retain the classical saving hypothesis that workers do not save, purely for convenience.

The net export rate is somewhat more involved and inevitably a bit more stylised. We will proceed as follows. Starting with the same net export demand function used in the previous section, we now explicitly subtract the imported intermediate goods, M_N^{IG}:

$$NX_N = n_e e^R + n_x Y_S - n_m Y_N - M_N^{IG}. \tag{3.46}$$

Recalling that $Y_S = Y_{NA} + \theta Y$, $Y_N = (1-\theta)Y$, and $M_N^{IG} = \theta Y$, we get

$$NX_N = n_e e^R + n_x Y_{NA} + n_x \theta Y - n_m (1-\theta) Y - \theta Y. \tag{3.47}$$

For non-zero values of the offshoring parameter, real total output of Northern MNCs affects Northern net exports through a number of channels. First, greater Northern (i.e. MNC) output implies more production at foreign affiliates, which creates income that, to an extent dictated by n_x, leads to more exports of final goods from the North. Second, larger values of Y mean higher incomes for Northerners that can be used to import from non-affiliates in the South, which is implied by the term $n_m(1-\theta)Y$. Lastly, reflected in the term θY is the fact that all final output requires intermediate goods that are imported. Throughout we maintain the simplifying assumption that offshoring does not affect the output of non-affiliated firms in the

South, which means that the term $n_x Y_{NA}$, which captures the exports due to increases in real output at non-affiliated Southern firms, is unaffected by Y or θ. Rewriting equation (3.47) more explicitly in terms of the offshoring parameter, we get

$$NX_N = n_e e^R + n_x Y_{NA} - Y[n_m + \theta(1 - n_x - n_m)]. \tag{3.48}$$

Having motivated the functional form, we follow the usual convention and define the ratio of Northern net exports to the multinationals' capital stock ($b = NX_N/p_N K$) in terms of capacity utilisation, rather than output levels. The net-export-rate responsiveness coefficients ($\beta_e, \beta_x, \beta_m$), which are analogous to the net-export-level responsiveness coefficients (n_e, n_x, n_m), are similarly considered fixed and exogenously given:

$$b = \beta_e e^R + \beta_x u_{NA} - u[\beta_m + \theta(1 - \beta_x - \beta_m)]. \tag{3.49}$$

Since $u = u_{FA} = u_N$, this definition of the net export rate function retains the intuitive justification of net export level function developed above. Finally, the Northern net export rate ($b_N = NX_N/p_N K_N$), denominated by the Northern capital stock rather than MNCs' total capital stock, is thus

$$b_N = \frac{b}{1-\theta}. \tag{3.50}$$

We are now in a position to solve for the equilibrium capacity utilisation rate of Northern firms. Inserting equations (3.28), (3.45), and (3.50) into (3.44), equilibrium is thus defined by

$$\frac{s_\pi \pi u}{v(1-\theta)} = \frac{(1-\phi)}{(1-\theta)} g + \frac{b}{(1-\theta)}. \tag{3.51}$$

Inserting equations (3.27) and (3.49) for g and b, and then simplifying and rearranging yields the equilibrium capacity utilisation rate of the multinationals' productive capacity (u), which is equal to the equilibrium capacity utilisation rate in the North and at foreign affiliates in the South

$$u^* = u_N^* = u_{FA}^* = \frac{(1-\phi)(\gamma + \gamma_\pi \pi) + \beta_e e^R + \beta_x u_{NA}}{s_\pi \pi / v + \beta_m + \theta(1 - \beta_x - \beta_m) - (1-\phi)\gamma_u}. \tag{3.52}$$

As before, we assume the Keynesian stability condition holds throughout, implying the denominator is always positive. The effect of offshoring on equilibrium capacity utilisation is

$$\frac{\partial u^*}{\partial \theta} = \frac{\frac{\partial \pi_N}{\partial \theta}\left[\gamma_\pi(1-\phi) - \frac{s_\pi u^*}{v}\right] + \frac{\partial e^R}{\partial \theta}\beta_e - (1 - \beta_x - \beta_m)u^*}{s_\pi \pi / v + \beta_m + \theta(1 - \beta_x - \beta_m) - (1-\phi)\gamma_u}, \tag{3.53}$$

Offshoring thus affects equilibrium aggregate demand, as proxied by capacity utilisation, through two channels. First, the profitability channel, reflected in the first term of the numerator, arises when offshoring leads to higher mark-ups. If $\gamma_\pi(1-\phi) > s_\pi u^*/v$, then higher profitability of Northern firms leads to higher capacity utilisation, since the positive effect on Northern investment is greater than the negative effect on consumption. If $\gamma_\pi(1-\phi) < s_\pi u^*/v$, then the opposite is true, which is more likely for higher fractions of foreign investment (ϕ). The sign of the second channel, which we will call the trade channel, is also ambiguous from a purely theoretical perspective. If $\beta_e(\partial e^R/\partial\theta) > (1 - \beta_x - \beta_m)u^*$, then offshoring leads to higher net exports through lower prices and higher international price

competitiveness, despite the negative effect (assuming $\beta_x + \beta_m < 1$) on net exports due to the changes in location of intermediate good production. If $\beta_e(\partial e^R/\partial\theta) < (1 - \beta_x - \beta_m)u^*$, net exports, and thus equilibrium capacity utilisation, are negatively affected by offshoring.

Inserting the expressions in equations (3.39), (3.42), and (3.43) for m_N, $\partial\pi_N/\partial\theta$, and $\partial e_N^R/\partial\theta$ respectively, we can express the numerator of $\partial u^*/\partial\theta$, which determines the sign of the effect of offshoring on equilibrium capacity utilisation, as follows:

$$\frac{w_\Delta\left[\rho(\gamma_\pi(1-\phi) - \frac{s_\pi u^*}{v}) + \beta_e e^R(1-\rho)\right]}{(1+m_0)(w_N)^\rho(w_N - \theta w_\Delta)^{(1-\rho)}} - (1 - \beta_x - \beta_m)u^*. \tag{3.54}$$

The parameter ρ, which determines the extent to which lower unit labour costs lead to a higher mark-up rather than a lower price, clearly influences the composition, size, and sign of the first term. More interesting, though, is the wage rate differential between North and South, w_Δ. The smaller the wage differential, the more likely it is that the effect of offshoring on capacity utilisation is negative (assuming $\beta_x + \beta_m < 1$). We must keep this in mind when we return to the possibility of wage convergence later.

While not the focus of this paper, it is worth commenting briefly on the equilibrium profit rate, saving rate, and net export rate in the North, which are as follows:

$$r_N^* = \frac{\pi u^*}{(1-\theta)v}\,, \tag{3.55}$$

$$\sigma_N^* = s_\pi r_N^*\,, \tag{3.56}$$

$$b_N^* = \frac{\beta_e e^R + \beta_x u_{NA} - u^*[\beta_m + \theta(1 - \beta_x - \beta_m)]}{(1-\theta)}. \tag{3.57}$$

It can be shown that these equilibrium values may respond positively or negatively to changes in the offshoring parameter. If $\partial u^*/\partial\theta$ is positive, the Northern profit and saving rates increase with higher values of the offshoring parameter. Furthermore, the North may turn from a net exporter to a net importer with a higher offshoring intensity, especially if β_e and β_x are small and $\beta_x + \beta_m < 1$. If $\partial u^*/\partial\theta$ is negative, matters are less straightforward and the signs of r_N^* and σ_N^* depend crucially on the size of the exogenous parameters.

3.3.4 Growth and hysteresis

The various equilibrium capital stock growth rates deserve special attention. We begin with the multinationals', Northern, and foreign affiliates' accumulation rates in any given equilibrium:

$$g^* = \gamma + \gamma_u u^* + \gamma_\pi \pi, \tag{3.58}$$

$$g_N^* = \left(\frac{1-\phi}{1-\theta}\right) g^*, \tag{3.59}$$

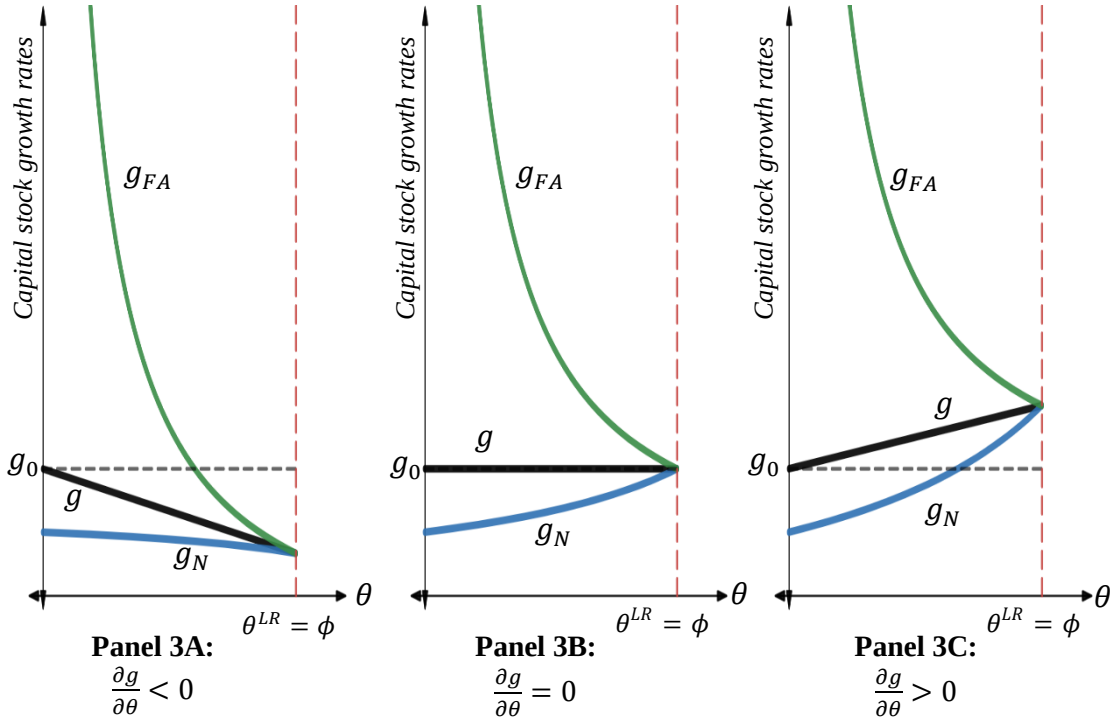
$$g_{FA} = \frac{\phi}{\theta} g^* \tag{3.60}$$

It follows that $\partial g^*/\partial\theta$ is positive if $\partial u^*/\partial\theta > 0$ and may be negative or zero if $\partial u^*/\partial\theta < 0$. Denoting the accumulation rate of Northern firms before offshoring by g_0, Figure 3.3 depicts

how the Northern, MNC, and foreign affiliate accumulation rates are related and how they are each affected by offshoring. For simplicity, the graphs show g as a linear function of θ, though we know from the preceding section that this is a simplification.

We begin with the most interesting observation, which is that the Northern accumulation rate suffers a negative shock in the first period when offshoring begins, no matter how the MNC accumulation rate is affected. In the proceeding periods, unless the MNC accumulation rate is very negatively affected by offshoring, as in Panel 3A, the Northern accumulation rate responds positively to increases in the offshoring parameter. In the long run, when $\theta = \phi$, both g_N and g_{FA} converge to g. If $\partial g/\partial\theta < 0$, as in Panel 3A, then the long-run Northern growth rate will be lower than the pre-offshoring rate. If $\partial g/\partial\theta = 0$, as in Panel 3B, the long-run Northern growth rate will converge back to its initial (pre-offshoring) value. Lastly, if $\partial g/\partial\theta > 0$, as in Panel 3C, the long-run Northern growth rate will exceed the pre-offshoring rate.

Figure 3.3 *Effect of offshoring on multinationals', Northern, and foreign affiliates' accumulation rates*



Thinking in terms of levels rather than growth rates, we can see that offshoring can give rise to hysteresis. To make this explicit, let us consider the simple case of Panel 3B, where $\partial g/\partial\theta = 0$, such that Northern firms' capital stock at any given time can be represented by

$$K_t = K_0 e^{g_0 t}, \tag{3.61}$$

where K_0 is the northern firms' capital stock before offshoring begins. Contrariwise, the capital stock *located* in the North is given by

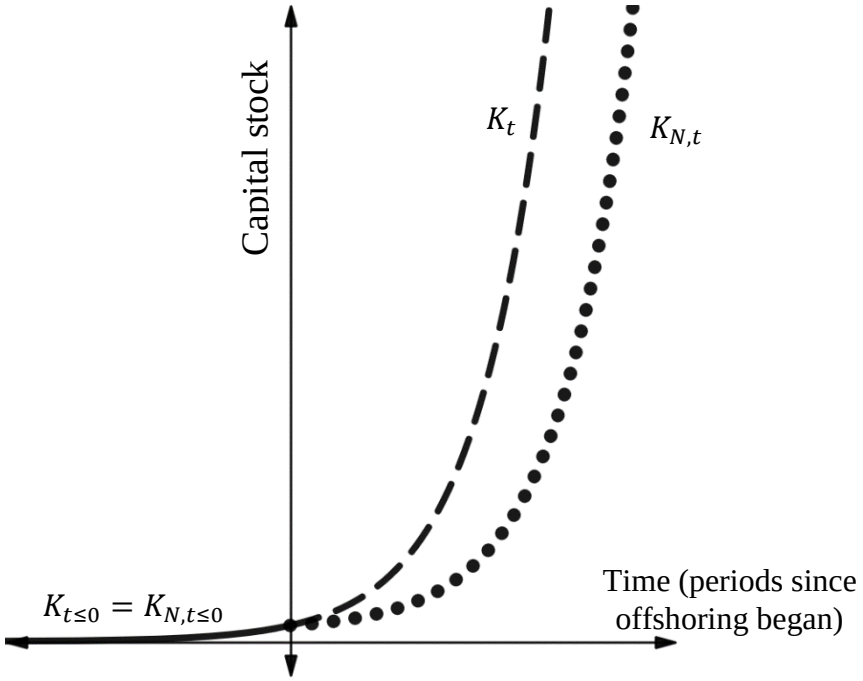
$$K_{N,t} = (1 - \theta_t) K_0 e^{g_0 t}. \tag{3.62}$$

To show how K_t diverges from $K_{N,t}$ over the long run, we must express θ_t as a function of time, which, by using equations (3.24) and (3.61), is given by

$$\theta_t = \phi(1 - e^{-g_0 t}). \tag{3.63}$$

Inserting equation (3.63) into (3.62), and graphing it alongside (3.61) in Figure 3.4, we can see how the Northern capital stock permanently diverges from its pre-offshoring trend after period zero. Of course, for a fixed rate of capacity utilisation, hysteresis will also be found for the level of output and of labour employed in the North, though we will return to the question of employment in more detail in the next section.

Figure 3.4 *Hysteresis of the Northern capital stock due to offshoring*



If we assume the growth rate of the non-affiliated capital stock in the South is constant and unaffected by offshoring,[18] then the growth rate of the total Southern capital stock (g_S) is given by a weighted average of the foreign affiliate and non-affiliate growth rates:

$$g_S = \frac{I_{NA} + I_{FA}}{K_{NA} + K_{FA}} = \frac{g_{NA}K_{NA} + g_{FA}K_{FA}}{K_{NA} + K_{FA}} = g_{NA} + \kappa\left(\frac{\phi}{\theta}g - g_{NA}\right), \tag{3.64}$$

Where the weighting term is $\kappa \equiv K_{FA}/(K_{NA} + K_{FA})$, i.e. the fraction of foreign affiliate capital in the total capital stock of the South. The time rate of change, denoted by a dot, of this endogenous fraction is given by

$$\dot{\kappa} = (g_{FA} - g_S)\kappa = \kappa(1 - \kappa)(\frac{\phi}{\theta}g - g_{NA}). \tag{3.65}$$

If $g > g_{NA}$ in all periods, then equations (3.64) and (3.65) tell us that the Southern growth rate is positively affected by offshoring. In this case, the fraction of foreign affiliate capital in total Southern capital will tend to one ($\kappa \to 1$) and the southern growth rate will tend to the MNC

[18] Of course, this is a large simplification stemming from the fact that our focus in this paper is on the effects of offshoring on the source of FDI rather than the recipient.

growth rate in the long run ($g_S^{LR} \to g^{LR}$). If $g < g_{NA}$, then the Southern growth rate is initially positively affected by offshoring (for low values of θ), but converges back to the growth rate of non-affiliate firms in the long run ($g_S^{LR} \to g_{NA} = g_{s,0}$). In sum, the Southern accumulation rate always benefits from offshoring in the short run. In the long run, g_s may remain permanently higher or converge back to its pre-offshoring rate, depending on how the MNC and non-affiliate growth rates compare.

As captured in Figure 3.5, this general result holds regardless of how the MNC accumulation rate is affected by offshoring, though the gradient of the g_s-curve is affected by the sign of $\partial g/\partial\theta$. In order to visualise the g_s-curve, an explicit form of κ in terms of θ is needed. From equations (3.61) and (3.63), we know that

$$K_{FA,t} = \theta K_t = \theta_t K_0 (\tfrac{\phi}{\phi-\theta}). \tag{3.66}$$

As non-affiliates' capital stock can be expressed similarly by

$$K_{NA,t} = K_{NA,0} e^{g_{NA} * t} = K_{NA,0} \left(\frac{\phi}{\phi-\theta}\right)^{\frac{g_{NA}}{g}}, \tag{3.67}$$

it follows that κ can be expressed as

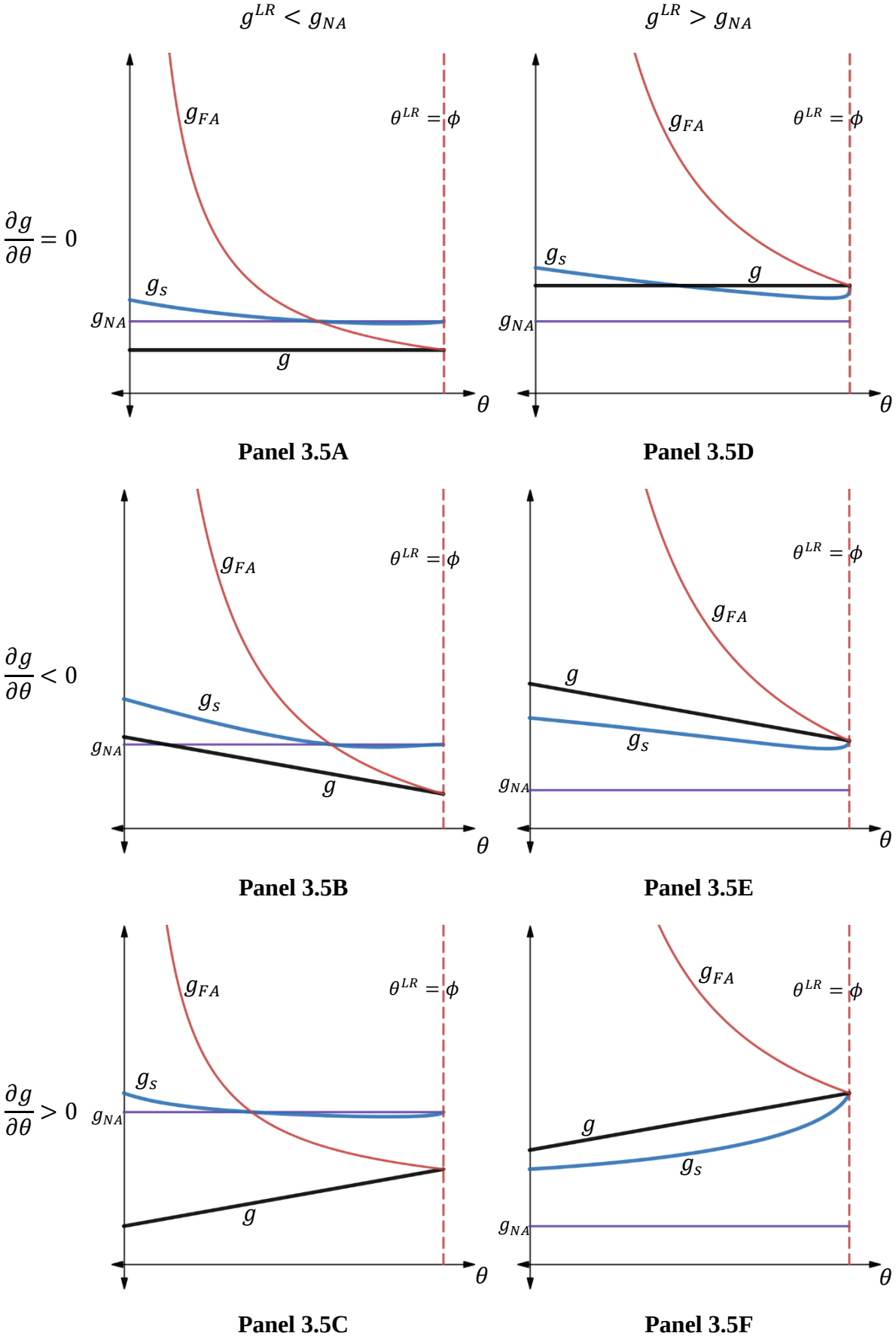
$$\kappa(\theta) = \frac{K_{FA}}{K_{NA} + K_{FA}} = \frac{1}{1 + \frac{K_{NA,0}}{K_0 \theta}\left(\frac{\phi}{\phi-\theta}\right)^{\left(\frac{g_{NA}}{g}-1\right)}}. \tag{3.68}$$

From this expression we also note that the ratio of Southern firms' capital stock to that of Northern firms in the period before offshoring began ($K_{NA,0}/K_0 = K_{S,0}/K_{N,0}$) clearly matters for g_s. Generally, the higher this ratio is, the smaller κ will be, and thus the closer g_s will be to g_{NA} in any period. At an intuitive level, this makes perfect sense: The accumulation rate of a very large economy that receives a fraction of the capital stock from a very small economy through offshoring will not be greatly affected. However, if roles are reversed such that the large economy offshores production to the smaller one, then the growth rate of the latter may be strongly affected. This point about the macroeconomic importance of the relative size of the FDI source and recipient economies is also emphasised in Woodgate (2020, 2021b). In Figure 3.5, it is assumed in all panels that this ratio is one, implying the capital stock of the North and the South are equal before offshoring begins.

3.3.5 Employment

The long-run growth rates discussed in the preceding section have relatively straightforward implications for employment in the long run. However, it would also be of interest to understand how the employment rates in the North and South behave in the transition to the long run. The difficulty in doing so is that employment depends on variations in capacity utilisation before the long run, and, as we saw in section 3.2, the response of capacity utilisation to changes in the offshoring parameter is nonlinear and thus rather unwieldy. Therefore, let us simplify our analysis of the effects of offshoring on the employment rate by supposing that capacity utilisation and the MNC accumulation rates respond in a linear fashion to changes in the offshoring parameter:

Figure 3.5 Effects of offshoring on the Southern accumulation rate



Panel 3.5A **Panel 3.5D**

Panel 3.5B **Panel 3.5E**

Panel 3.5C **Panel 3.5F**

$$u(\theta) = u_0 + u_\theta \theta, \tag{3.69}$$

$$g(\theta) = g_0 + g_\theta \theta. \tag{3.70}$$

The coefficients u_θ and g_θ, which represent simplified versions of $\partial u^*/\partial\theta$ and $\partial g^*/\partial\theta$ respectively, may—based on the analysis in the preceding sections—be negative, zero, or positive. However, it is impossible to have a case where $g_\theta < 0$ and $u_\theta \geq 0$ since our model tells us that $\partial g^*/\partial\theta$ can only be negative if $\partial u^*/\partial\theta$ is negative. All other combinations of u_θ and g_θ are possible, but we will limit our analysis, for reasons of space, to the more realistic cases where both functions are positive for any value of the offshoring parameter, i.e. we assume that $u(\theta) > 0$ and $g(\theta) > 0$ for all θ.

The employment rate in the North, defined by

$$\varepsilon_N = \frac{(1-\theta)L}{LF_N}, \tag{3.71}$$

requires expressions for L and LF_N, where the latter denotes the labour force in the North. Supposing LF_N continues to grow at its pre-offshoring equilibrium rate g_0, we can write

$$LF_N = LF_{N,0}e^{g_0 t}. \tag{3.72}$$

Given the fixed coefficients of production and the expression for K in equation (3.61), we know

$$L = \frac{au}{v}K = \frac{au}{v}K_0 e^{gt}. \tag{3.73}$$

Thus, the employment rate in the North is given by

$$\varepsilon_N = \frac{(1-\theta)auK_0 e^{(g-g_0)t}}{vLF_{N,0}}. \tag{3.74}$$

Since the pre-offshoring Northern employment rate, $\varepsilon_{N,0}$, is given by $\varepsilon_{N,0} = au_0K_0/v\,LF_{N,0}$, and since equation (3.63) can be rearranged to yield an expression for the time parameter in terms of the offshoring parameter, we can express equation (3.74) purely as a function of the offshoring parameter:

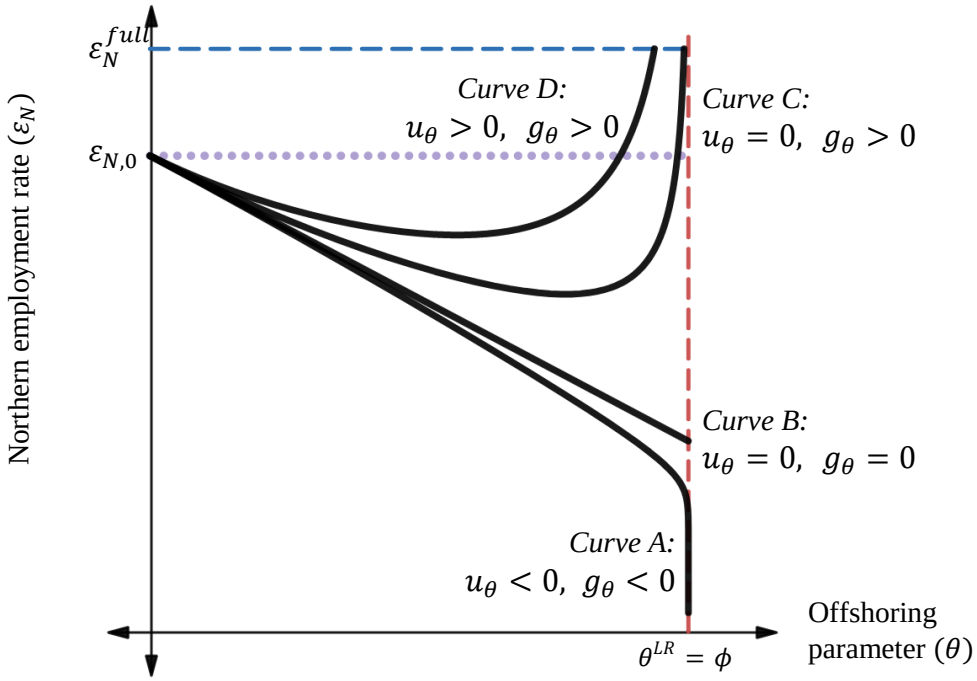
$$\varepsilon_N = \varepsilon_{N,0}(1-\theta)\left(1+\frac{u_\theta}{u_0}\theta\right)\left(\frac{\phi}{\phi-\theta}\right)^{\left[\frac{g_\theta\theta}{g_0+g_\theta\theta}\right]}. \tag{3.75}$$

To analyse the sign of the derivative of the Northern employment rate with respect to the offshoring parameter, we make use of the much simpler logarithmic derivative:

$$\frac{\partial \ln \varepsilon_N}{\partial\theta} = \frac{u_\theta/u_0}{1+u_\theta\theta/u_0} - \frac{1}{1-\theta} + \frac{g_\theta}{g_0+g_\theta\theta}\left[\frac{\theta}{\phi-\theta} + \frac{g_0}{g_0+g_\theta\theta}\ln\left(\frac{\phi}{\phi-\theta}\right)\right] \tag{3.76}$$

From this follows a number of interesting results. In the very short run, when the offshoring parameter is close to zero, offshoring leads to a lower employment rate even if

Figure 3.6 *Effects of offshoring on the Northern employment rate*



capacity utilisation and the MNC accumulation rate are positively affected by offshoring. To see this, we evaluate the logarithmic derivative of the employment rate at $\theta = 0$ and get

$$\frac{\partial \ln \varepsilon_N}{\partial \theta}\Big|_{\theta=0} = \frac{u_\theta}{u_0} - 1 \quad < 0 \tag{3.77}$$

Since $u_\theta < u_0$ by construction, $\partial \varepsilon_N / \partial \theta$ is negative when the offshoring process begins, regardless of the effect on accumulation rates and even if the effect on capacity utilisation is positive. As can also be seen in equation (3.75), the Northern employment rate will continue to fall in the long run if the effect of offshoring on the MNC accumulation rate is negative, i.e. if $g_\theta < 0$. In this case, represented by Curve A in Figure 3.6, the employment rate will tend to zero in the long run, ceteris paribus. If $g_\theta = 0$ and $u_\theta = 0$, ε_N will tend to $\varepsilon_{N,0}(1-\phi)$ in the long run, as shown in Curve B in Figure 3.6, whereas if $g_\theta = 0$ and $u_\theta < 0$ then ε_N will tend to $\varepsilon_{N,0}(1-\theta)(1+u_\theta\theta/u_0)$.[19] Lastly, if $g_\theta > 0$, the employment rate will tend to full employment in the long run (e_N^{full}). In this scenario, the size and sign of u_θ determines how quickly full employment is reached. In Figure 3.6, both Curve C and Curve D reflect a situation where $g_\theta > 0$, but the former is such that $u_\theta = 0$ and the latter is such that $u_\theta > 0$.

While the effect on employment in the long run may be positive or negative, the model shows that offshoring will have an unambiguously negative effect on employment in the North in the short run. It is worth pointing out, however, that this "short" run may not be so short in historical time. For example, given that ϕ is the fraction of Northern firms' annual foreign investment, Equation (3.63) tells us that it would take around 16.5 years for the Northern employment rate to recover back to its pre-offshoring rate of $\varepsilon_{N,0}$ in Curve D in Figure 3.6, and

[19] This scenario, where $g_\theta = 0$ and $u_\theta < 0$, is not graphed in Figure 3.6 because it looks similar to Curve B.

in the case of Curve C, it would take around 29.5 years.[20] Of course, this is not to say our simple model that relies on ceteris paribus conditions and the exclusion of many variables can generate accurate predictions about the timing of real events. However, the simple exercise emphasises how the transition in logical time may take quite a considerable number of years in historical time. Hence, "short run" unemployment due to offshoring should not be neglected as just some temporary blip of little importance.

Regarding the reaction of the Southern employment rate to increases in the offshoring parameter, it is quite straightforward, under the assumptions that the Southern labour force grows at its pre-offshoring equilibrium rate of g_{NA} and that the non-affiliate sector is unaffected by offshoring, to show that the employment rate increases in the South in the short run. It tends to full employment in the long run as well if $g^{LR} > g_{NA}$. If $g^{LR} < g_{NA}$, however, the higher Southern employment rate is not permanent—it will tend back to the pre-offshoring employment rate in the long run.

3.3.6 Endogenous wage convergence

A final point to consider in this analysis concerns the assumption with which we began, namely the assumption that the wage differential between the North and the South is positive and constant ($w_\Delta = w_N - ew_S > 0$). In the face of falling employment in the South and rising employment in the North—whether in the long run or just the transition to the long run—we can consider the implications of wages reacting endogenously to changes in the employment rate. We might suppose that the wage rate is a positive function of the employment rate for the usual reasons, such as firms bidding up wages when labour is scarce or labour bargaining power being strengthened in times of low unemployment:

$$w = f\left(\overset{+}{\varepsilon}\right) \tag{3.78}$$

Thus, a falling wage differential, w_Δ, may result from a falling Northern employment rate and rising Southern employment rate, both caused by offshoring:

$$\frac{\partial w_\Delta}{\partial \theta} < 0 \quad in\ periods\ when\ \frac{\partial \varepsilon_N}{\partial \theta} < 0\ and\ \frac{\partial \varepsilon_S}{\partial \theta} > 0. \tag{3.79}$$

However, if we recall the result found in expression (54), a smaller value of w_Δ means capacity utilisation in the North is more likely to be negatively affected by offshoring. This follows because a smaller wage differential undermines the only basis on which offshoring can benefit the Northern economy, namely by improving Northern firms' price competitiveness and by increasing mark-ups and thereby profitability. Without the resulting boosts to net exports and investment, aggregate demand and capacity utilisation in the North is more likely to suffer from the leakage of income from the North to pay employees in the South (reflected in the $-(1 - \beta_x - \beta_m)u^*$ term in expression 54). Hence, if offshoring leads to a smaller wage differential in this way, the effects of offshoring on capacity utilisation (u_θ) and capital

[20] More specifically, these are the non-zero values of the time parameter for which $\varepsilon_N(\theta) = \varepsilon_{N,0}$ for Curves C and D, where the former is graphed using the values $u_0 = 0.8$, $u_\theta = 0$, $g_0 = 0.1$ and $g_\theta = 0.05$ and the latter $u_0 = 0.8$, $u_\theta = 0.05$, $g_0 = 0.1$ and $g_\theta = 0.1$. These values are purely for the sake of illustration, of course.

accumulation (g_θ)—and thus employment—is more likely to become negative. Of course, this may lead to further feedback effects on the wage differential, complicating matters further. Suffice it to say here, however, that it is possible that a Northern economy, which would have enjoyed higher long run utilisation, accumulation, and employment rates were the wage differential to remain constant, may in fact suffer lower utilisation, accumulation, and employment rates in the long run due to the effect of "transitionary" changes in employment on the wage differential. In other words, with an endogenous wage differential, "transitionary" unemployment and stagnation may become permanent. Graphically, this can be represented in Figure 3.6 by endogenous shifts of the ε_N-curve from, say, Curve D to C, B, or A, depending on the size of decrease in the wage differential, capacity utilisation, unit gross profits, and the MNC accumulation rate.

3.4 Concluding remarks: Relevance, Implications, and Limitations

A number of macroeconomic phenomena characterise the modern age of neoliberal globalisation in advanced economies, such as rising FDI flows, falling wage shares, low and stable rates of inflation, shifts of bargaining power from labour to capital, an increased reliance on trade, hysteresis and stagnation tendencies. The model developed in this paper shows how each of these phenomena may be causally related to offshoring. Of course, this is not to say that offshoring is the only relevant causal factor behind these phenomena. Stockhammer (2004), Palley (2013), Skott & Ryoo (2008), and Hein (2012)—to give but a few examples of the large body of work on financialisation—are also highly pertinent in providing a theoretical explanation for many of these developments. Moreover, as Milberg & Winkler (2010, 2013) and Auvray & Rabinovich (2019) argue, it is likely that the twin forces of financialisation and globalisation are mutually dependent and reinforcing. Nonetheless, it is interesting to note that offshoring alone could still give rise to many of the same modern macroeconomic issues in a counterfactual world where no financialisation took place.

Although the focus has been on the FDI-outflow economy in this paper, it also has clear implications for the FDI-inflow economy, given that the South experiences higher rates of growth in the short and, possibly, long run. This may help explain the high rates of growth of countries with high FDI inflows in the era of neoliberal globalisation.[21] Potentially relevant economies in this respect may include the so-called Asian Tigers (Hong Kong, Singapore, South Korea, and Taiwan), the Celtic Tiger (Ireland), and some central and eastern European countries (e.g. Hungary, Czechia, Slovakia, and Estonia), among many other possible candidate countries.

Besides the empirical relevance of this model, it also has important implications for both theory and policy. For example, suppose an economy exhibits a falling wage share and growth rate due to offshoring. Any econometric work on the demand regime of this hypothetical economy that fails to control for the effects of offshoring is likely to find that it is wage-led.[22]

[21] This finding complements, using a long-run model, the results found in the previous chapter (Woodgate, 2021b), which was on a short-run basis.

[22] Of course, it is very rare to see empirical work on demand regimes control for aspects of offshoring. Presumably, this is partly because the theoretical case for doing so has been hitherto underdeveloped and partly because data to construct offshoring control variable on a long-run basis may be hard to come by. This point is emphasised and elaborated upon in chapter 5 (Woodgate, 2021a).

A policy prescription of increasing the wage rate may thus follow on the basis that it may help achieve the twin goals of lower inequality and higher demand and growth. Yet, if MNCs base their location decisions partly on wage differentials as posited in this paper, this push for higher wages may backfire if domestic-owned MNCs increase their foreign investment and foreign-owned MNCs reduce investment in the domestic economy as a result. Hence, offshoring likely presents deep-seated structural issues for the effective macroeconomic governance of any given economy.

Of course, this does not imply that policymakers in our hypothetical economy ought to accept this threat and throw in the towel. Nor does it imply that policymakers should seek to align their macroeconomic goals with the goals of the MNCs, as has been popular in recent decades, and engage in the "commercialisation of state sovereignty" (Palan, 2002) by, for example, seeking to lower or moderate wages and corporate tax rates, or by offering state aid incentives. As argued in chapters two and four (Woodgate 2020, 2021b), such beggar-thy-neighbour growth strategies may work for one country acting alone, but are not likely to work for multiple countries enacting such strategies in unison.

Offshoring does imply, however, that there may be a renewed logic for a kind of protectionist policy, not aimed at foreign firms *per se* but at domestic firms that may be considered to be moving an excessive degree of business activity to foreign affiliates. Yet, one country acting alone to limit the degree of cheap imported intermediate goods from foreign affiliates is likely to suffer from worsened international price competiveness and lower external demand. Hence, as in the related issue of tax competition, there are strong grounds for international cooperation and simultaneous, coordinated policy action in any attempt to reign in offshoring. For the reasons discussed by Palley (2015, p.61), efforts to reign in offshoring are enormously difficult to achieve from a political economy perspective. Yet, as shown in this paper, failure to do likely implies not only worsening inequality in all periods but also lower unemployment and growth in the short run, if not the long run as well, not to mention the socio-political issues tied up in deindustrialisation and growing imbalance of bargaining power between workers and capitalists.

Final remarks are reserved for the limitations of the model presented here, the emphasis of which it is hoped may spur further research on offshoring from a post-Keynesian perspective. Firstly, we assumed throughout that labour productivity was the same in the Northern firms as it was at foreign affiliates, despite experience telling us that it is the most labour intensive tasks that get offshored first. Second, the non-affiliate sector in the South is unaffected by offshoring in this paper, which is also a simplification. Third, it could also be of great interest to understand the macroeconomic effects of offshoring via *horizontal* FDI, where foreign affiliates produce final goods rather than intermediate goods. One presumes this kind of offshoring would lower exports from the "North" as external demand is met from abroad rather than at home, and could thus have consequences for trade imbalances. Fourth, we supposed that Northern firms achieved their desired fraction of offshore production in the long run (θ^{LR}) by investing a fixed fraction of annual total investment ($\phi = \theta^{LR}$) indefinitely. On one hand, this setup reflects the fact that the offshoring process takes time and does not happen overnight. However, on the other hand, it may be more realistic to suppose that MNCs, especially those that are not financially constrained, are not willing to wait so long. The may therefore set $\phi > \theta^{LR}$ and decrease ϕ when θ approaches or is at θ^{LR}. A flexible foreign investment fraction (ϕ) may thus also warrant some attention—perhaps from a simulated approach, as the matter may become intractable or at least severely complicated from a purely analytical approach. Finally, we took

the nominal exchange rate to be exogenously fixed in this analysis, which is an assumption that may wish to be relaxed in future research. In any case, it is hoped that the theory developed here can shed light upon and spur further work on the determinants and macroeconomic implications of the location of multinational production.

4. Can Tax Competition Boost Demand? Causes and Consequences of the Global Race to the Bottom in Corporate Tax Rates

Abstract

Corporate tax rates have been consistently falling around the world for decades now. This paper aims to understand the causes and consequences of this "global race to the bottom". In particular, we wish to test the hypothesis that this race to the bottom is driven by demand-boosting corporate tax competition, where, contrary to traditional Kaleckian theory, lower corporate taxes may positively affect demand through increased investment due to multinational corporations (MNCs) that seek higher net profits through (re)locating in low-tax jurisdictions. In order to do so, we build a general theory of the effect of average effective corporate tax rates (AECTRs) on MNC location. We use this theory to justify the addition of a tax-sensitive, foreign direct investment channel in the investment function of a canonical Kaleckian model. As a result, we are able to determine the conditions under which a country may be "tax competition-led", where lowering AECTRs increases demand through increased MNC investment and in spite of the negative effect on government expenditure given a balanced budget. While we find it is possible for some countries to be tax competition-led, we also find theoretical and empirical support for the importance of a coordination problem that lessens or nullifies the effect of lowering AECTRs when many countries do so simultaneously. We refer to this problem as the "paradox of tax competition", since, like other fallacies of composition commonly identified in post-Keynesian thought, this is a phenomenon where the benefits of one country acting alone are reduced or eliminated if other countries act the same way at the same time. Based on this model, we develop crude but nonetheless informative estimates that indicate that the race to the bottom has had a negative effect on demand in the vast majority of OECD countries. In this sense, we find that the persistence of policymakers to continue to compete on corporate taxes "imprudent". Model-consistent policy recommendations are offered, chief among which are multilateral tax coordination or, failing that, technical changes in how individual countries collect corporation tax.

4.1 Introduction

Statutory and effective corporate tax rates have been consistently falling around the world for decades now. Concerns of a "global race to the bottom" in corporate tax rates have grown, as has the consensus among empirical studies that tax competition drives a significant part of this downward trajectory. However, theories of tax competition are dominated by models built on the neoclassical theory of capital, which puts the cost of capital at the centre of investment decisions made using marginalist optimisation.[23] Given post-Keynesians' long-standing

[23] See Wilson (1999) for an overview of the tax competition literature.

objections to neoclassical investment theory, many of the formal tax competition models are hard to swallow. Despite this—and the fact that beggar-thy-neighbour and inequality-exacerbating phenomena like tax competition epitomise the natural domain of post-Keynesian thought—post-Keynesian theory still lacks a formal model of the matter.

Perhaps this is because competing on corporate tax rates is dismissed out of hand as ill-advised in a demand-led economy. After all, from a Kaleckian standpoint, it would seem most prudent to be increasing rather than decreasing corporate tax rates. On this matter, to the extent that corporation tax can be considered a capital tax, Kalecki (1937b, p.450) concludes its increase "is perhaps the best way to stimulate business and reduce unemployment". Alternatively, if corporation tax represents a tax on capitalist income, Kalecki still stresses its increase also boosts demand.[24] This follows, generally speaking, from the idea that increasing corporation taxes injects into the economy through government expenditure what would otherwise leak in the form of capitalist savings, given a balanced budget. Hence, it is with this logic in mind that Kalecki (1944, p. 57) argues that "income tax financed expenditure—which has the advantage not only of securing more employment but also of reducing the inequality in the distribution of incomes (after taxation)—should be pushed as far as politically possible".

Does it then follow that the race to the bottom amounts to sustained and widespread economic mismanagement from a post-Keynesian perspective? Though tempting, such a conclusion cannot follow so straightforwardly since, in the two articles alluded to above, Kalecki is considering a *closed* economy. Issues of trade, international competitiveness and capital flows complicate matters. Moreover, as is pointed out in OECD (2018a), we have seen the exponential growth in size and number of multinational corporations (MNCs) since the 1970s, whose production and investment is not limited to one country but expands across many and relocates as conditions change. This phenomenon relates to what Palley (2015, p.53) terms "barge economics" since it is "as if factories are placed on barges that float between countries to take advantage of lowest costs – which can be due to under-valued exchange rates, *low taxes*, *subsidies*, absence of regulation, or abundant cheap exploitable labor" [emphasis added]. Indeed, the growth strategy of countries like the Republic of Ireland suggest a recognition of this "barge economics" logic with the successful use of corporate tax policy to attract real greenfield foreign direct investment (FDI). It is in this sense we might expect lower corporate taxes to boost demand through influencing the *location* decisions of profit-seeking MNCs, and not the *size* of MNC investment through lowering the cost of capital, as in neoclassical capital theory.

The purpose of this paper then is to understand the real economic motive to compete for foreign direct investment (FDI) using tax and related policy variables; introduce this motive into a formal Kaleckian model; and use this model to analyse the causes and consequences of the race to the bottom in corporate tax rates. In doing so, this paper presents a simple but general theory of how the average effective corporate tax rate (AECTR) can attract or repel a part of globalised production. We find reason to believe that AECTRs may attract MNC investment,

[24] This is especially true, Kalecki (1944) argues, if investment in fixed capital, due to depreciation or otherwise, is tax deductible, since then expected profitability and thus private investment is unaffected by higher taxes.

and that, in especially small economies, this inflow can more than compensate for the demand-hindering effect of lower tax revenues in a balanced budget Kaleckian model. In this way, we talk of countries being "tax competition-led" when lowering AECTRs increases capacity utilisation and "government expenditure-led" otherwise.

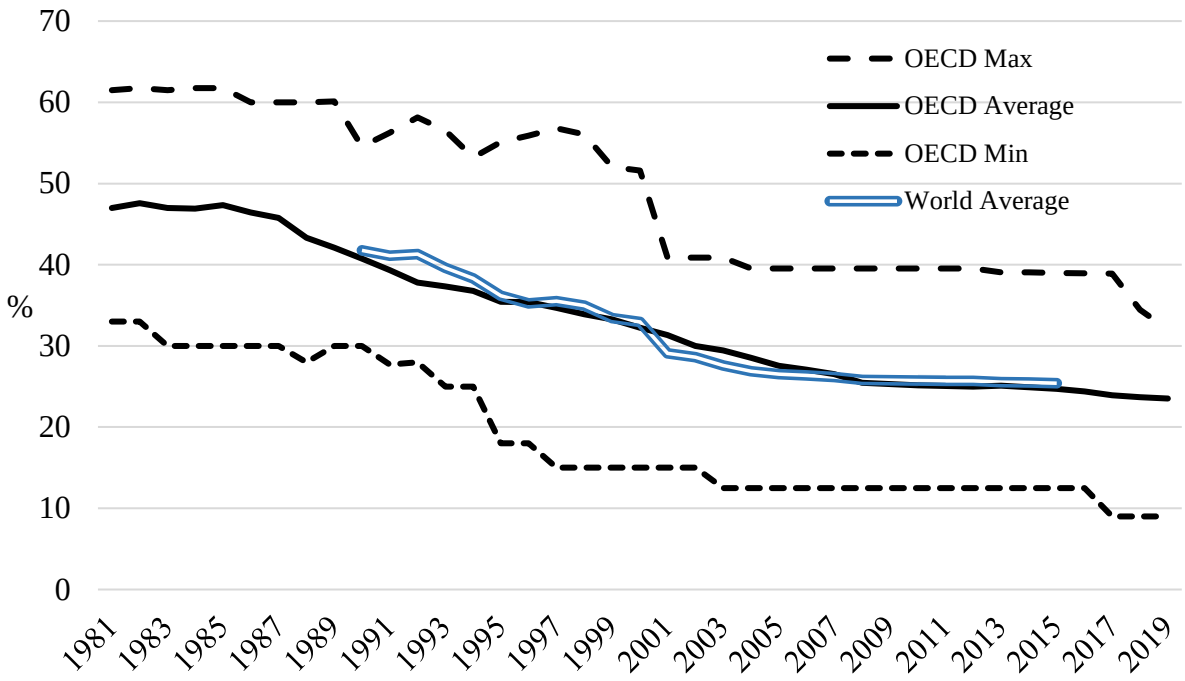
If demonstrating the existence of these two tax regimes is the first theoretical contribution of this paper, then the second is showing the existence of a coordination problem that emerges when countries decide to change AECTRs simultaneously. We refer to this coordination problem as the "paradox of tax competition", because, like other fallacies of composition commonly identified in post-Keynesian thought, this is a phenomenon where the benefits of one country acting alone are reduced or eliminated if other countries act the same way. More specifically, since we suppose MNCs are attracted to countries where the AECTR is *relatively* low, a collective fall in AECTRs may fail to distinguish any one country as being a relatively low-tax jurisdiction. In this case, the potential gains for a tax competition-led country are not realised, and the only entities to gain are MNCs.

Our "Kaleckian tax competition" model predicts that small economies are most likely to engage in tax competition and provides a basis for the rough estimation of a country's tax regime. Additionally, it allows us to consider the extent to which a country must change its AECTR relative to that of the rest of the world to avoid the paradox of tax competition and realise increased demand. On the back of this theory, we can build crude but informative estimates of which OECD countries, if any, have benefitted in recent decades from the race to the bottom. Our results suggest very few economies boosted demand through cutting AECTRs and thereby highlight what we refer to as the "imprudence" of the race to the bottom. Lastly, in response to this problem, we suggest policy solutions that are consistent with the model, the most effective among which are multilateral tax coordination or, failing that, unilateral adoption of a tax apportionment mechanism.

4.2 Motivation: The global race to the bottom in corporate tax rates

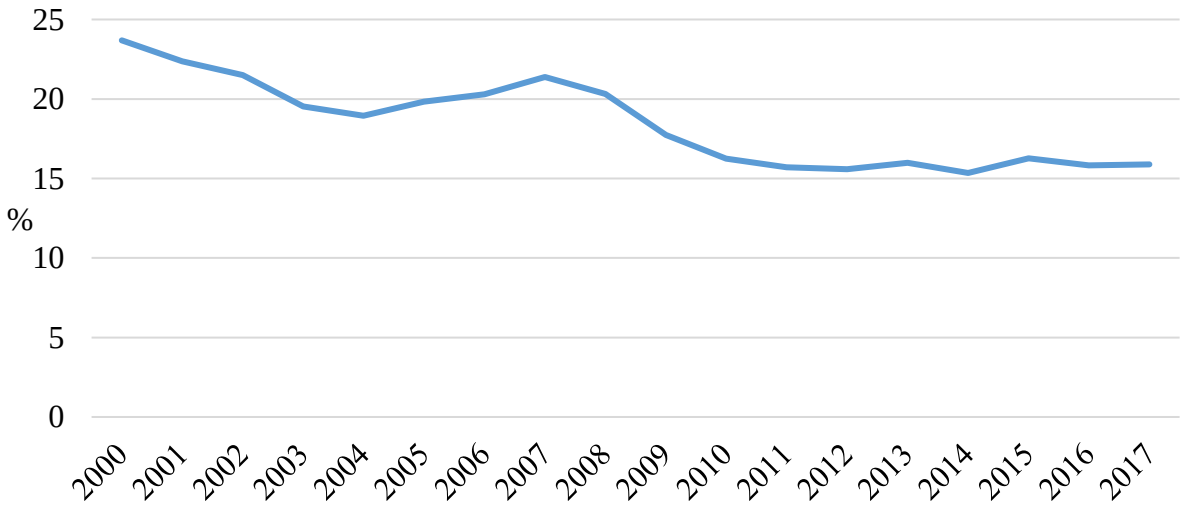
Figure 4.1 reflects what can be referred to as the global race to the bottom in corporation tax. Graphed are the minimum, average, and maximum values of total statutory corporate income tax rates for the 36 OECD countries between the years of 1981 and 2019 with data from the OECD tax database (2019a). After a short period of relative stability in the 1980s, the whole distribution saw a sustained downward shift with the mean halving from 47.0% in 1981 to 23.5% in 2019. Data for 188 countries around the world from the IMF fiscal affairs department (2017) shows the world average largely mirrors developments in the OECD average over the period of data availability, 1990 – 2015.

Figure 4.1 *Statutory corporate tax rates in the OECD (1981 - 2019) and around the world (1990 - 2015)*



Effective corporate tax rates have likewise exhibited race to the bottom characteristics in many countries around the world. Figure 4.2 reflects this fact, with data from the European Commission (2019) showing that the mean of the implicit tax rates on corporate income in the 28 countries of the European Union falling over the years of data availability, 2000 – 2017. The data exhibited in Figures 4.2 and 4.3 clearly provoke questions about the causes of these downward trends.

Figure 4.2 *Average implicit tax rate on corporate income across the EU28, 2000 - 2017*



One significant driver for which there is evidence is tax competition. For our purposes, we can give the following definition: *Tax competition refers to the uncooperative setting of the relevant tax and fiscal policy variables in order to attract, or avoid losing, FDI inflows*. Since

it amounts to the deliberate intention of diverting flows from one region to another, tax competition is a clear beggar-thy-neighbour phenomenon. However, it is also one that has yet to be modelled formally in post-Keynesian economics. Before we try to build our own theory, let us briefly review the evidence for the existence and operation of tax competition.

4.2.1 Empirical relevance for tax competition as a driver of the race to the bottom

In their survey of the empirical literature on the causes of falling corporate tax rates, Devereux and Loretz (2013, p.765) find that "despite significant variation in the approaches there emerges a relatively clear pattern of evidence for tax competition." Overesch and Rincke (2009; 2011), through different econometric approaches, find significant evidence for tax competition among EU countries in particular. Winner (2005) also finds evidence to suggest the presence of tax competition, and argues that its operation implies a shift of the tax burden from capital to labour. This point, also found in Deprez (2003), stresses the exacerbating repercussions of tax competition for income inequality.

Case studies like that of the Republic of Ireland also bring the relevance of tax competition into focus. In a growth accounting exercise using a demand-oriented, balance-of-payments constrained approach, Garcimartín *et al.* (2008, p.427) find that "tax reductions (particularly with respect to corporation tax) are the primary single factor behind the Irish miracle". Having attracted MNCs to Ireland, the importance of their real activity to the Irish economy can be gleaned by looking at the related statistics. For example, using data for the year 1993, Görg and Ruane (1997, p.21) find that 68% of output, and 45% of employment, and 88% of exports in the manufacturing sector in Ireland were due to foreign-owned MNCs.

Further empirical evidence that supports the relevance of tax competition can be seen in studies investigating the relationship between corporate tax variables and FDI flows. While there is no consensus, Dellis *et al.* (2017, p.11) conclude that "most studies have to date found … a negative relationship between tax rates and FDI flows". This is supported by OECD (2008, p.2), which states that "studies examining cross-border flows suggest that on average, FDI decreases by 3.7% following a 1 percentage point increase in the tax rate on FDI".

4.2.2 Is it prudent to race to the bottom in a demand-led economy?

The empirical evidence suggests that policymakers compete downward on corporate tax rates to remain attractive to mobile capital bases and that doing so may be effective. As mentioned in the introduction however, in a post-Keynesian framework, the usual policy recommendation is to *raise* taxes on capitalist income, which includes corporation taxes. Hence, we are left with the question, once tax competition in taken into account, whether demand is boosted through raising or lowering corporate tax rates. Which channel is dominant, the Kaleckian government expenditure channel or the tax competition channel, and under what conditions? If the latter channel is dominant in most countries, could the race to the bottom be the result of policymakers prudently engaging in tax competition?

Before our attempts to address these questions, a few clarifications are in order. First, as may already be clear, tax competition is fought not merely with statutory rates, but also with deductions, subsidies, tax holidays, and so on. Hence, in this paper, we will speak most

frequently of average effective corporate tax rates (AECTRs) to try to reflect this reality. This is, of course, still a simplification, as effective tax rates may vary at the sectoral and even firm level within an economy, giving rise to many, rather than one, relevant tax rate. We maintain the simplification is worth making for now, though, and withhold a more detailed discussion of the resulting limitation until the end of this article.

Second, it is worth elaborating upon what is meant by *prudently* engaging in tax competition. Since we are in a demand-led framework, by "prudent" we mean simply that policymakers lower or raise AECTRs only when aggregate demand is boosted by doing so. If demand suffers by lowering or raising ACETRs, we will consider that "imprudent". We recognise that such "imprudence" may stem from different causes, such as economic policy misguided by unfounded economic theory, regulatory capture, or whatever the case may be. In any case, we will consign ourselves to this specific notion of what is prudent policy, as it is most convenient in our analysis.

Third, since we wish to only concern ourselves with the real effects of FDI in an economy, we limit our discussion in this paper to greenfield FDI. There is some evidence to suggest mergers and acquisitions may also have real effects (see, for example, Ashraf et al. 2015), but, for simplicity, we will ignore this kind of FDI. Relatedly, unlike in chapter two, we do not address tax competition for paper profits nor the phenomena of base erosion and profit shifting here. We omit such topics not because they are unimportant, but because the channels through which they operate and their effects on the economy are quite distinct to those explored here, as noted in chapter two.

Lastly, let us be clear from the outset about how lower AECTRs may cause higher demand through higher FDI. We are not alleging that lower capital taxes will increase the total size of MNC investment by lowering the cost of capital, in contrast to the neoclassical capital theory found in Jorgensen (1963). The argument is rather that differences in AECTRs across countries will influence the *location* of MNC production. In order to determine the induced greenfield FDI inflows due to tax competition in a given country, we first need an idea of the extent to which relative AECTRs determine the location of MNC production.

4.3 How does corporation tax influence the location of MNC production?

Determinants of the location of MNC investment are numerous, varied, and often interdependent. While minimising its tax bill may not be the first priority of every MNC, it is nonetheless likely to be an important secondary goal. Such is the summary of the survey-based evidence offered by Dunning and Lundan (2008). The authors find that "cross-border differences in corporate taxes are rarely a primary motive for MNC activity, but that once a decision is made to engage in FDI or to increase foreign production in a particular country or region, they may play an important role on the siting of activity within that country or region" (ibid., p.614).

4.3.1 A general theory of tax competition

Against this backdrop, suppose an MNC is looking to expand activity and considers where in the world to do so. To build our theory, we make two assumptions, namely that MNCs locate where net profits are highest and that they are rational to the extent that they can approximately compare the potential net profits from operating in different countries.

To begin, assume all countries have the same AECTR. In this case, the MNC would examine the potential revenue and material, wage, transportation and other costs in *C* countries, and use this information to approximate what its gross profits would be from operating in those *C* countries. Ordering the potential gross profits of the MNC in those *C* countries from lowest, $\Pi^{G}_{MNC,C}$, to highest, $\Pi^{G}_{MNC,1}$, the MNC would be inclined to invest in country 1. Of course, since AECTRs are set equal, the order of potential *gross* profits is the same as potential *net* profits (from the lowest $\Pi^{N}_{MNC,C}$ to the highest $\Pi^{N}_{MNC,1}$). There may be a country *j*, where even if it had an AECTR of zero, the MNC would not wish to invest there since its gross profits would be less than its net profits in its first best alternative country ($\Pi^{G}_{MNC,j} < \Pi^{N}_{MNC,1}$). Hence, the investment of the MNC is sensitive to the AECTR in (*j-1*) countries.

Let us now consider the perspective of a policymaker in one of those (*j-1*) countries, country *i*. In order to understand how low the AECTR in country *i*, τ_i, must be to attract the investment of the MNC, we must consider the difference in net profits between locating production in country *i* and the first best alternative of the MNC.

$$\Delta\Pi^{N}_{MNC} = (1-\tau_i)\Pi^{G}_{MNC,i} - (1-\tau_1)\Pi^{G}_{MNC,1} \tag{4.1}$$

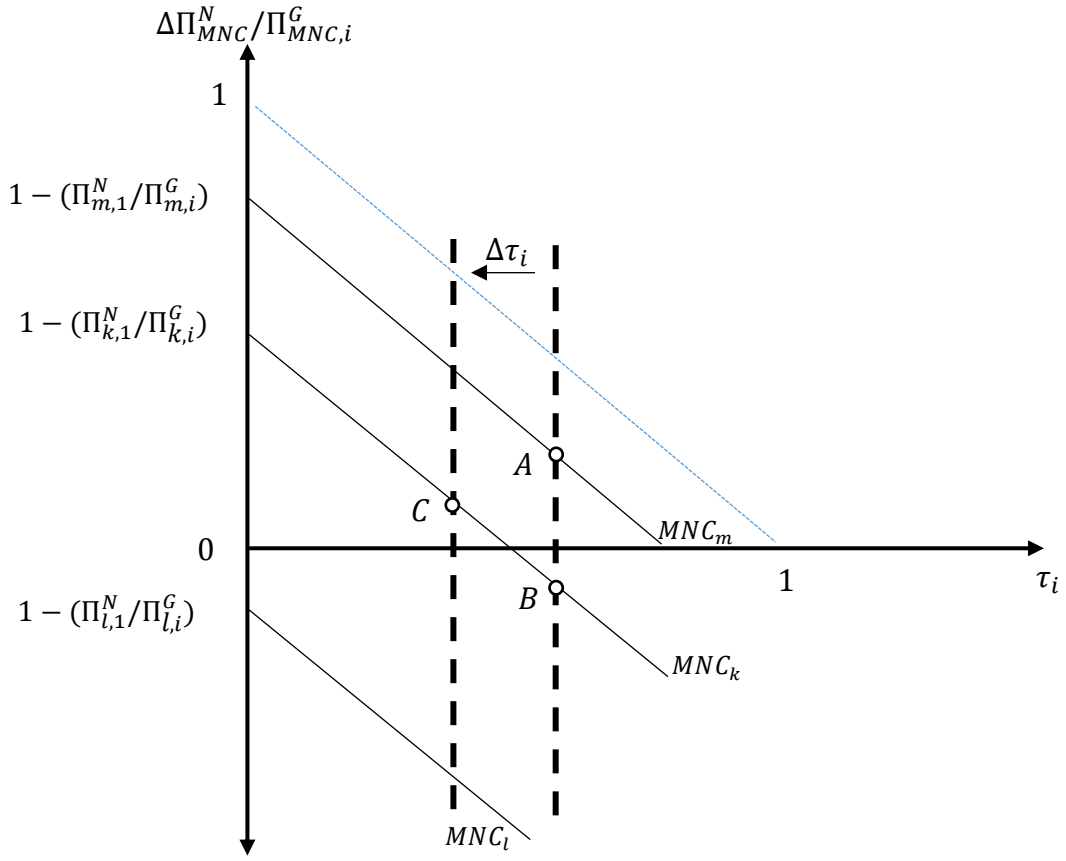
To attract the MNC, the policymaker must ensure $\Delta\Pi^{N}_{MNC} > 0$, which implies

$$\tau_i < 1 - (\Pi^{N}_{MNC,1}/\Pi^{G}_{MNC,i}) \tag{4.2}$$

This condition is represented in Figure 4.3 1 for country *i*, now with three different MNCs, denoted *m*, *k*, and *l*, where the relationship between the change in net profits and the tax rate in country *i* is given by equation (4.3). We will refer to this relationship as the "profits-tax schedule". Note that the factors determining Π^{G}_{MNC} do not vary over time in our analysis. We are interested in the effects of AECTRs, and hence everything is held constant apart from τ_i and the AECTR in the first best alternative country, τ_1, (and thus $\Pi^{N}_{MNC,1}$ may vary if and only if τ_1 varies).

$$\Delta\Pi^{N}_{MNC}/\Pi^{G}_{MNC,i} = (1 - \Pi^{N}_{MNC,1}/\Pi^{G}_{MNC,i}) - \tau_i \tag{4.3}$$

Figure 4.3 *Attracting MNC investment through lowering the AECTR in country i*



At the initial rate of τ_i, net profits of *m* are positive (point A) and thus *m* will be incentivised to invest in country *i*. However, the change in net profits of *k* from moving to country *i* would be negative at this rate (point B), and so τ_i will would have to be reduced to incentivise *k* to invest (point C). Note that *l* cannot be induced to invest for any plausible (i.e. nonnegative) τ_i. Only the investment of MNCs where $\Pi^G_{MNC,i} > \Pi^N_{MNC,1}$ is sensitive to changes in τ_i.

The profit-tax schedules of these MNCs will be shifted down if the policymakers in the first best alternative countries also follow this logic, as it will increase potential net profits of MNCs from $\Pi^N_{MNC,1}$ to $\Pi^{N'}_{MNC,1}$. This is displayed in Figure 4.4 for MNC *k*, where now country *i* will need to further reduce τ_i if it is to recapture *k* after the profit-tax schedule of *k* shifts down after potential net profits in the first best alternative increases ($\Pi^{N'}_{k,1} > \Pi^N_{k,1}$). This process of tax competition will repeat in every period thereafter until tax differentials are so small they no longer influence MNC location. At this point, MNCs will ultimately base location decisions on *gross* profit differentials instead.

What this simple setup illustrates is that there is good reason to suspect a number of MNCs will locate production in a country that acts alone in lowering its AECTR. However, if all or most countries lower their AECTRs, there will be no or little increase in MNC investment in a given country. Lowering AECTRs, if done *en masse*, acts to move the goalposts, so to

speak, that determine if lower AECTRs attract MNC investment. Graphically, this is displayed in Figure 4.5, where the policymaker in country *i* cuts τ_i to attract MNC *k*, but the AECTR also falls in the first best alternative country of *k*. Here the tax cuts do not increase FDI inflows into country *i* since the move from point A to point B in Figure 4.5 does not represent a positive change in net profits for MNC *k*. Tax competition may thus represent a fallacy of composition: Cutting AECTRs may boost demand if a country can act alone in doing so, but may dampen demand if other countries simultaneously lower their AECTRs. Hence, what is prudent policymaking for one country acting alone may be utterly foolish for all acting *en masse*. As this phenomenon is akin to other "paradoxical" results common to post-Keynesian thinking (*cf.* Lavoie 2014, p. 18), we will refer to it as "the paradox of tax competition".

Considering the paradox of tax competition alone would seem to imply that the race to the bottom does not reflect prudent policymaking, but this would be a premature conclusion. Not joining the race to stay tax competitive means accepting MNC activity will increasingly shift to the other countries that do, as in Figure 4.4, which dampens demand. One must also consider countries that became especially competitive quickly—those that actively lead in the race to the bottom and have done so since an early stage. Do these aggressively tax competitive countries see gains in the form of boosted demand?

To address these issues we must analyse tax competition in the context of a full macroeconomic model, and compare its effects to the changes in government expenditure. We will use the so-called "canonical Kaleckian" (*cf.* Lavoie, 2014) or "neo-Kaleckian" (*cf.* Hein,

Figure 4.4 *Losing MNE investment due to a fall in AECTRs outside of country i*

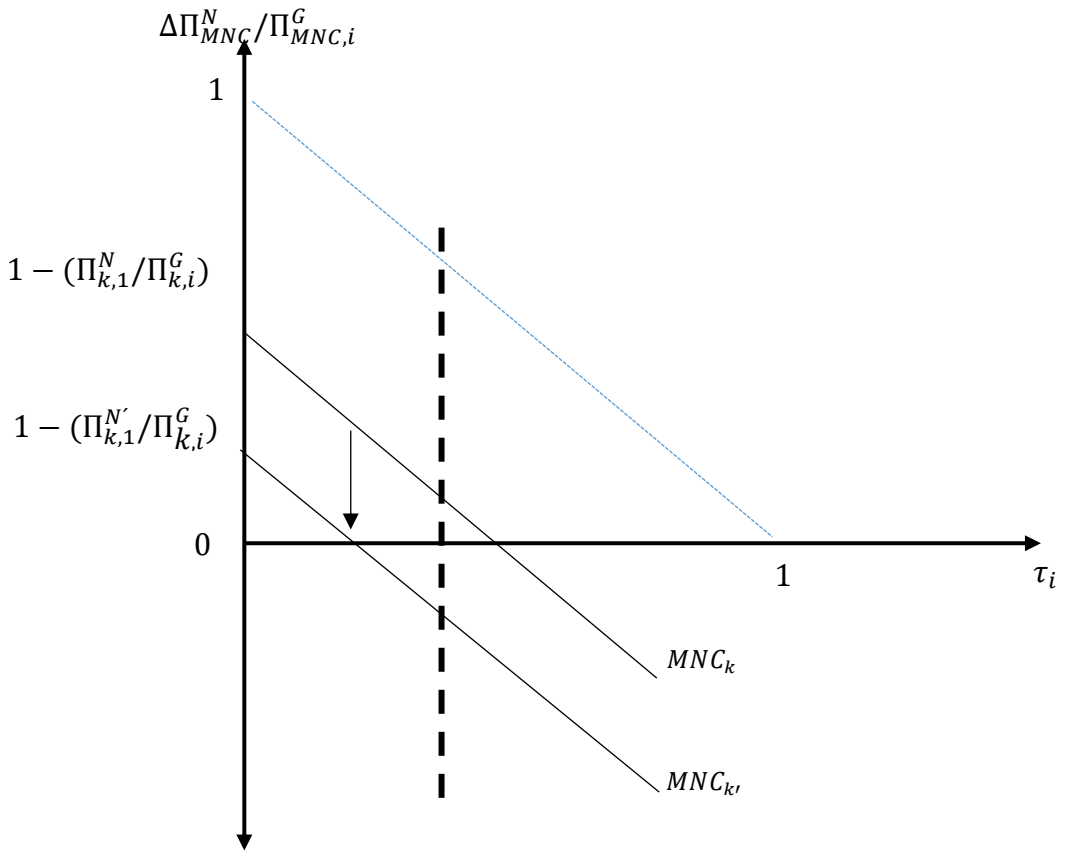
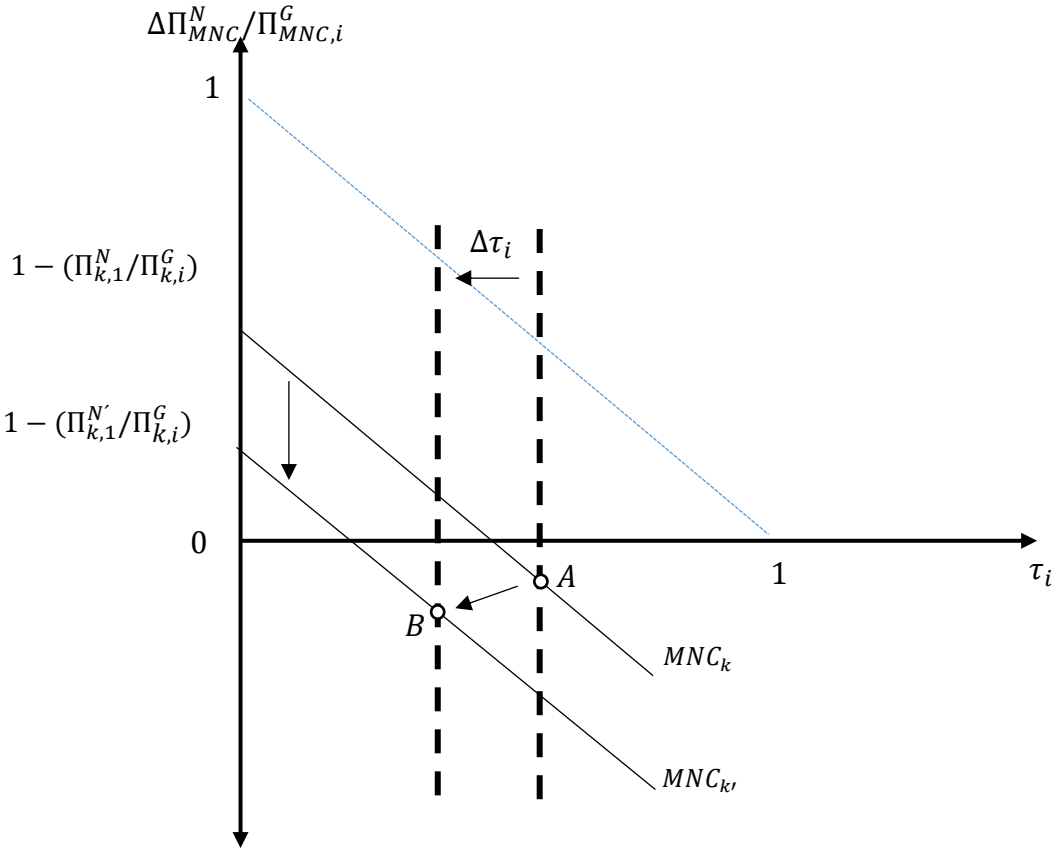


Figure 4.5 *The "paradox of tax competition"*



2014) model for this purpose. First, though, we must augment its investment function to include this new tax-induced greenfield FDI channel.

4.3.2 The tax-sensitive greenfield FDI channel

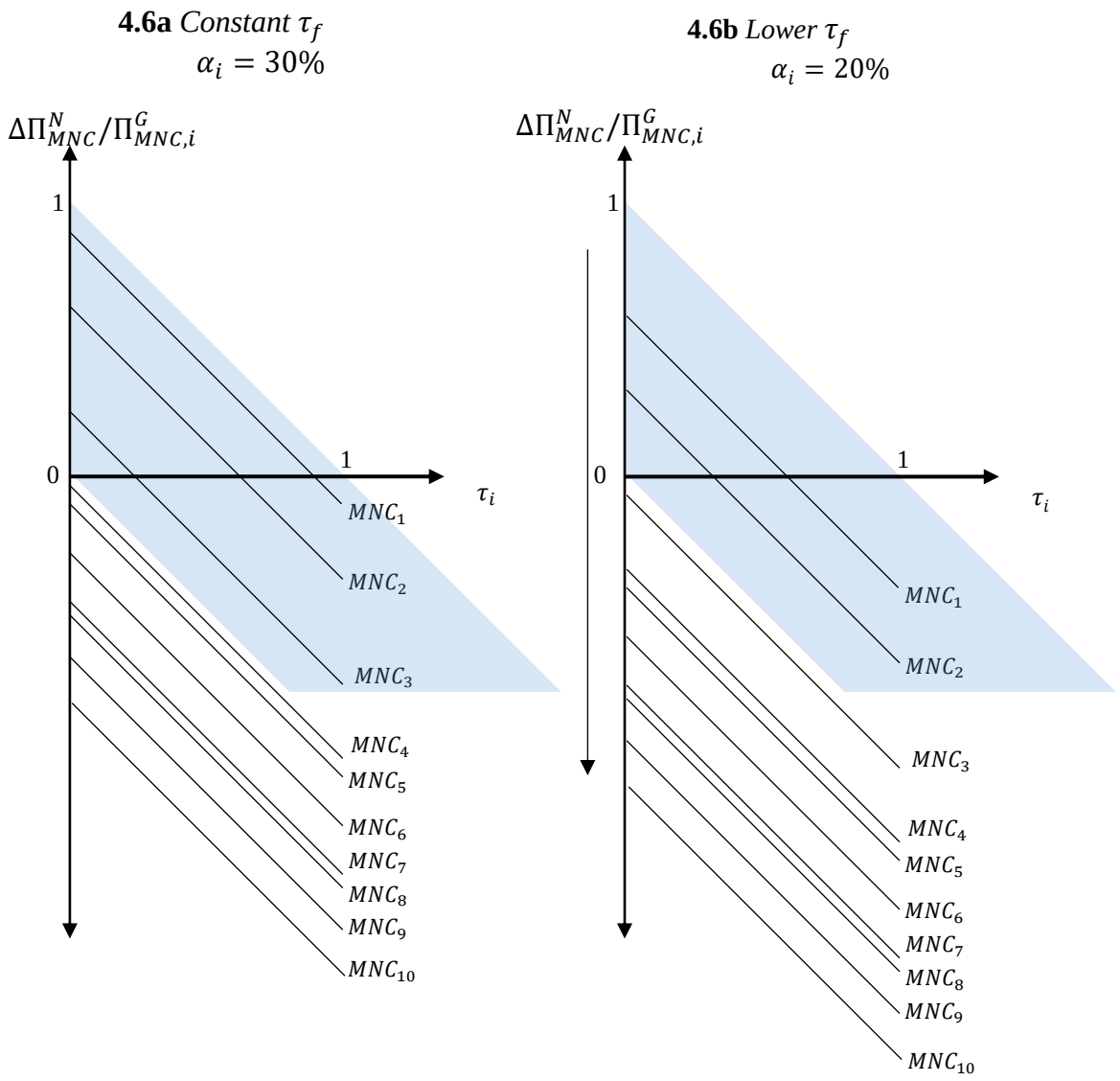
We begin by stating our assumptions about MNC investment.[25] Contrary to chapter three, we will treat the total size of worldwide MNC investment as an exogenous and autonomous variable with respect to our model, which we will denote by I_m. We suppose a fraction, α_i, of total worldwide MNC investment is sensitive to changes in τ_i, the AECTR of country *i*. Alternatively, α_i can be thought of as the fraction of I_m that would go to country *i* in a given period if $\tau_i = 0$. With reference to what has gone before, α_i is determined by the sum of the investment of those MNCs whose gross profits in country *i* is greater than net profits in their first best alternative location. Hence, $\alpha_i I_m$ is the size of *potential* tax-sensitive greenfield FDI inflows for country *i*. *Actual* tax-induced greenfield FDI inflows into country *i*, $I_{m,i}$, is then given by

$$I_{m,i} = (1-\tau_i)\alpha_i I_m \qquad (4.4)$$

[25] In this paper, we will take MNE investment and greenfield FDI to be synonymous. We will take both to mean the total investment of all MNEs around the world, even if some of that investment ends up in the home economies of its parent MNEs. The important point is that such investment *could* have gone abroad if net profits were to have been increased by doing so.

An important point here, again with reference to the discussion in section 4.3.1, is that the proportion of tax sensitive greenfield FDI, α_i, is dependent on the AECTRs in the rest of the world. To see this most clearly, consider Figure 4.6 where we suppose, for the sake of illustration, that there are ten MNCs in the world. We see in panel 4.6a that three MNCs could increase net profits by moving to country *i* for a low enough τ_i. Assuming, again purely for the sake of illustration, that the size of the investment of each MNC is equal, then it follows that α_i is 30%. Hence, it appears in this period that the policymaker in country *i* could conceivably attract 30% of worldwide greenfield FDI. Now suppose AECTRs in the rest of the world fall in the periods thereafter, reflected in a falling average AECTR in the rest of the world, denoted τ_f. This serves to shift the MNC profit-tax schedules downward, as seen in panel 4.6, such that

Figure 4.6 *Effect of falling AECTRs in the rest of the world, τ_f, on the proportion of worldwide tax sensitive greenfield FDI that country i may attract, α_i*



only two MNCs could now be attracted to country *i* through lower taxes. Thus, in this scenario, α_i falls to 20%.

It is with this logic in mind that we can think of there being a positive relationship between α_i and τ_f. Generally, we expect α_i to be zero when τ_f is zero or very small, since then there is no room to attract I_m with a lower τ_i. Yet the relation between α_i and τ_f is unlikely to be smooth, continuous, and one-to-one for two reasons. First, τ_f may fall without affecting the number of MNCs whose change in net profits from moving to country *i* is still positive for a low enough τ_i. Second, the size of planned investment of each MNC is not equal in reality. For instance, a falling τ_f may first make it impossible for country *i* to attract MNC_m, whose planned investment was a negligible fraction of worldwide investment and hence α_i is hardly affected. As τ_f continues to fall and country *i* cannot attract MNC_k with a lower AECTR either, however, α_i may be strongly affected if the planned investment of MNC_k is relatively large.

For the purposes of analysis, let us abstract from these complications for now by modelling the proportion of worldwide MNC investment that is sensitive to changes in the domestic AECTR, α_i, as a simple positive and proportional function of the average AECTR in the rest of the world, τ_f. This is shown in in equation (4.5), where the constant of proportionality, $\rho_i \in [0,1]$, represents the average change in α_i given a change in τ_f and is determined by country-specific factors that influence the gross profits of MNCs. In this paper, we will treat ρ_i as a constant.

$$\alpha_i = \rho_i * \tau_f \tag{4.5}$$

4.4 A Kaleckian model with tax competition

Let us briefly consider the effects of higher corporation taxes in a benchmark Kaleckian model with no FDI inflows before we add the tax-sensitive greenfield FDI channel seen in equations (4.4) and (4.5). We will simplify our approach by assuming that the tax on corporate profits is the only tax in the economy, that its incidence falls solely on capitalists, and that the government runs a balanced budget at all times:

$$G = \tau\Pi \tag{4.6}$$

where *G* is government expenditure and *Π* represents the total profit level. We assume workers earn wages and capitalists earn profits such that the classes and their income types are mutually exclusive. Furthermore, we will proceed using the classical saving hypothesis that workers do not save, whereas capitalists save a fraction of their income. Hence, using the usual decomposition for the rate of profit, we arrive at our saving rate (σ) function:

$$\sigma = \frac{S}{K} = \frac{s_\pi(1-\tau)\Pi}{K} = s_\pi(1-\tau)\left[\frac{\Pi}{Y}\frac{Y}{Y^P}\frac{Y^P}{K}\right] = s_\pi(1-\tau)h\frac{u}{v} \tag{4.7}$$

where *S* is total saving, *K* is the capital stock, *Y* is output, Y^P is potential output, s_π is the propensity to save out of profits, h is the profit share, *u* is the capacity utilisation rate, and *v* is the capital-to-potential-output ratio, assumed to be constant.

The rate of investment (g) is determined by animal spirits (γ_1) and the rate of capacity utilisation:

$$g = \frac{I}{K} = \gamma_1 + \gamma_2 u \tag{4.8}$$

Lastly, and following Hein (2014, p. 290), we shall consider the determinants of the rate of net exports (b) to be the real exchange rate (e^R), domestic capacity utilisation and foreign capacity utilisation (u_f):[26]

$$b = \frac{NX}{K} = \beta_1 e^R - \beta_2 u + \beta_3 u_f \tag{4.9}$$

In the goods market equilibrium, leakages must equal injections, implying that the savings rate must be equal to the rates of investment and net exports:

$$\sigma = g + b \tag{4.10}$$

Before we solve our system, we must highlight the usual assumption of Keynesian stability:

$$\frac{\delta\sigma}{\delta u} > \frac{\delta g}{\delta u} + \frac{\delta b}{\delta u} \tag{4.11}$$

And so, for our particular open-economy model, stability in the goods market thus requires the following:

$$s_\pi(1-\tau)\frac{h}{v} + \beta_2 > \gamma_2 \tag{4.12}$$

4.4.1 Benchmark model solution

Now we are in position to solve our model by inserting equations 4.6 until 4.9 into 4.10 and solving for the equilibrium capacity utilisation rate (u^*):

[26] We also follow the assumption that the Marshall-Lerner condition holds and, as such, the effect of the real exchange rate on the rate of net exports (β_1) is positive.

$$u^* = \frac{\gamma_1 + \beta_1 e^R + \beta_3 u_f}{s_\pi(1-\tau)\frac{h}{v} - \gamma_2 + \beta_2} \tag{4.13}$$

A few remarks are in order. Unsurprisingly, the paradox of saving (Keynes, 1936) holds in our model. The paradox of costs (Kalecki, 1966; Rowthorn, 1981) may or may not hold depending on the effect of the profit share on the real exchange rate (*cf.* Blecker 1989). However, this is not our focus here. What is of greater interest for our purposes is the effect of an increase in the capital tax rate on equilibrium capacity utilisation, which is clearly positive:

$$\frac{\delta u^*}{\delta \tau} > 0 \tag{4.14}$$

This effect is due to the injection of capitalist income through government spending, which would have otherwise been a leakage in the form of capitalist savings.[27] Hence, this effect is dependent upon assumptions about the fiscal budget, or, more precisely, about what the government does with the changes in tax revenues resulting from changes in the tax rate.

From the standpoint of such a wage-led model, the current worldwide downward trend in corporate tax rates can only be viewed as ill-informed and self-defeating since inequality (4.14) indicates demand, proxied by *u*, is positively affected by higher corporation tax. Now we look to compare these results to a neo-Kaleckian model with tax competition effects.

4.4.2 Adding the tax competition channel

To add the tax competition channel, we simply augment the investment function in equation (4.8) by the FDI channel specified in equations (4.4) and (4.5), and standardise $I_{m,i}$ by the capital stock in country *i*, as we did before

$$g_i' \;=\; g_i + \frac{I_{m,i}}{K_i} \;=\; \gamma_{1,i} + \gamma_{2,i} u + (1-\tau_i)\rho_i \tau_f g_{m,i} \tag{4.15}$$

where $g_{m,i} = I_m / K_i$.

Proceeding now to solve our system for the equilibrium rate of capacity utilisation, and reiterating that our stability condition in 4.6 must apply again for our model to be determinate, we arrive at:

$$u_i^* = \frac{\gamma_{1,i} + \beta_{1,i} e^R + \beta_{3,i} u_f + (1-\tau_i)\rho_i \tau_f g_{m,i}}{s_{\pi,i}(1-\tau_i)\frac{h_i}{v_i} - \gamma_{2,i} + \beta_{2,i}} \tag{4.16}$$

[27] The same effect is derived by Dutt (2013, p.107) in a similar model.

Again, as we did with the benchmark model, let us now take the derivative of capacity utilisation with respect to the domestic AECTR. For convenience, let us denote the numerator of equation (4.16) by *N* and the denominator by *D* in the interim stages of the derivation.

$$\frac{\delta u_i^*}{\delta \tau_i} = \frac{-\rho_i \tau_f g_{m,i} D + (s_{\pi,i} h_i / v_i) N}{D^2} = \frac{(s_{\pi,i} h_i / v_i)\, N/D - \rho_i \tau_f g_{m,i}}{D}$$
$$= \frac{u_i^*\, s_{\pi,i} h_i / v_i - \rho_i \tau_f g_{m,i}}{s_{\pi,i}(1-\tau_i)\, h_i / v_i - \gamma_{2,i} + \beta_{2,i}} \tag{4.17}$$

We are now in a position to comment on the sign of the effect of the domestic AECTR on domestic equilibrium capacity utilisation. Again, the denominator is none other than our stability condition, which is positive by the usual assumption. Therefore, the sign of $\delta u_i^* / \delta \tau_i$ is determined by the numerator:

$$\frac{\delta u_i^*}{\delta \tau_i} \lesseqgtr 0 \quad if \quad u_i^*\, s_{\pi,i} h_i / v_i \lesseqgtr \rho_i \tau_f g_{m,i} \tag{4.18}$$

This is arguably much easier to interpret when reduced and expressed in levels, recalling that $v_i = K_i / Y_i^P$, $g_{m,i} = I_m / K_i$, $h_i = \Pi_i / Y_i$ and $u_i = Y_i / Y_i^P$,

$$\frac{\delta u_i^*}{\delta \tau_i} \lesseqgtr 0 \quad if \quad s_{\pi,i}\, \Pi_i \lesseqgtr \rho_i \tau_f I_m \tag{4.19}$$

The conditions set out in equation (4.14) are significant because, first and foremost, they indicate that policymakers in country *i* can stimulate demand by lowering their AECTR, in stark contrast to the traditional neo-Kaleckian model where this was not possible. The left-hand side is pre-tax saving, which varies from country to country depending on the size and structure of the economy. It represents the government expenditure channel to demand. As pre-tax saving increases, so does the potential of the effect of a higher tax rate on demand, as it would direct what would be a leakage in the form of savings into an injection in the form of government expenditure. The right-hand side, however, represents the allure of tax competition. As I_m grows, the size of the FDI pie to be fought over grows. As α_i grows through a higher τ_f, the easier it is to take a slice. In this paper we will call a country "tax competition-led" if $s_{\pi,i}\, \Pi_i < \rho_i \tau_f I_m$ and "government expenditure-led" so long as $s_{\pi,i}\, \Pi_i > \rho_i \tau_f I_m$.

4.4.3 Endogenous regime shifts

With regards to the dynamics of the model, it should be pointed out that the profit level, Π_i, is endogenous. For any period in which $\delta u_i^* / \delta \tau_i$ is positive and τ_i is raised or $\delta u_i^* / \delta \tau_i$ is negative and τ_i is lowered, the profit level increases via increased demand and output. As the profit level rises, $s_{\pi,i}\, \Pi_i$ will grow relative to $\rho_i \tau_f I_m$, all else being equal. In the former case, this means $\delta u_i^* / \delta \tau_i$ can only become more strongly positive. In the latter case, $\delta u_i^* / \delta \tau_i$ starts in a negative position and tends towards zero. However, assuming that changes in τ_i (and the

resulting effects on Π_i) are discrete, $\delta u_i^*/\delta\tau_i$ can overshoot zero and become positive.[28] Hence, the inherent dynamics of our model played out in logical time suggest that an economy led by a prudent policymaker may endogenously shift from a tax competition-led regime ($\delta u_i^*/\delta\tau_i < 0$) into a government expenditure-led one ($\delta u_i^*/\delta\tau_i > 0$), whereas as a government-expenditure-led regime is stable and self-reinforcing. Theoretically, a prudent tax competition-led country would cut its AECTR repeatedly until it reaches zero (or some other minimum that is set by socio-political factors), and would have no incentive to increase its rate until its profit level is induced to rise to the point where the country becomes government expenditure-led.[29]

4.4.4 The paradox of tax competition revisited

At this point, we must recall an important feature of tax competition, namely the coordination problem that arises when even a prudent policymaker in a tax competition-led country lowers the domestic AECTR against a backdrop of other countries around the world simultaneously doing the same thing. So far, in our analysis of the sign of $\delta u_i^*/\delta\tau_i$, we have ignored this possibility, as we were primarily concerned with the question of whether the FDI channel could dominate the government expenditure channel at all. Given the *potential* benefits to demand of tax competition, where the potentiality is partly based on the degree to which an economy can act alone, let us analyse the *actual* effects of lowering AECTRs when many countries decide to do so *en masse*.

The Kaleckian tax competition model enables such analysis, since the effect of many countries lowering their AECTRs is reflected in a falling τ_f. The total differential, then, of equilibrium capacity utilisation given both a change in the domestic AECTR and the average AECTR in the rest of the world is given by

$$du_i^* = \frac{\delta u_i^*}{\delta\tau_i} d\tau_i + \frac{\delta u_i^*}{\delta\tau_f} d\tau_f \tag{4.20}$$

$\delta u_i^*/\delta\tau_i$ has already been derived in equation (4.17), and $\delta u_i^*/\delta\tau_f$ can easily be shown to be

$$\frac{\delta u_i^*}{\delta\tau_f} = \frac{(1-\tau_i)\rho_i g_{m,i}}{s_{\pi,i}(1-\tau_i)\frac{h_i}{v_i} - \gamma_{2,i} + \beta_{2,i}} \tag{4.21}$$

Hence, equation (4.20) is the same as

$$du_i^* = \frac{u_i^* s_{\pi,i} h_i/v_i - \rho_i\tau_f g_{m,i}}{s_{\pi,i}(1-\tau_i)\, h_i/v_i - \gamma_{2,i} + \beta_{2,i}} d\tau_i + \frac{(1-\tau_i)\rho_i g_{m,i}}{s_{\pi,i}(1-\tau_i)\, h_i/v_i - \gamma_{2,i} + \beta_{2,i}} d\tau_f \tag{4.22}$$

[28] This assumption seems reasonable since, in reality, changes in AECTRs are due to discrete and abrupt changes in the statutory rate and other corporate tax related policies.

[29] While the theoretical possibility of an endogenous regime shift in logical time is worth noting, we must also stress that, in historical time, exogenous variables may change such that this becomes a moot point. In particular, the exponential growth of I_m in recent decades with the rise of globalisation may simply dominate the growth in the profit level, especially that of small economies.

Setting $du_i^* = 0$ and, again, reducing and expressing in levels, we find that

$$d\tau_i = \mu_i \; d\tau_f \qquad\qquad where \;\; \mu_i = \frac{(1-\tau_i)/\tau_f}{1-(s_{\pi,i}\Pi_i/\rho_i\tau_f I_m)} \tag{4.23}$$

Equation (4.23) says that the change in τ_i must be a multiple, μ_i, of the change in τ_f for equilibrium capacity utilisation to be unaffected. The factor, μ_i, depends on the size of current τ_i relative to τ_f, and the tax regime of country *i*. If it is tax competition-led ($s_{\pi,i}\Pi_i < \rho_i\tau_f I_m$), then μ_i will be positive, and if it is government expenditure-led ($s_{\pi,i}\Pi_i > \rho_i\tau_f I_m$), μ_i will be negative.

Given a change in τ_f, to what extent should a given country lower or raise its AECTR to boost equilibrium capacity utilisation? It follows that the demand-boosting change in the domestic AECTR that is simultaneous to the change in τ_f is given by inequality (4.23a) for a government expenditure-led country and inequality (4.23b) for a tax competition-led country.

$$du_i^* > 0 \quad if \quad d\tau_i > \frac{(1-\tau_i)/\tau_f}{1-(s_{\pi,i}\Pi_i/\rho_i\tau_f I_m)} d\tau_f \;\; and \;\; s_{\pi,i}\Pi_i > \rho_i\tau_f I_m \tag{4.23a}$$

$$du_i^* > 0 \quad if \quad d\tau_i < \frac{(1-\tau_i)/\tau_f}{1-(s_{\pi,i}\Pi_i/\rho_i\tau_f I_m)} d\tau_f \;\; and \;\; s_{\pi,i}\Pi_i < \rho_i\tau_f I_m \tag{4.23b}$$

The conditions in (4.23a) and (4.23b) show that to increase equilibrium capacity utilisation it is necessary but not always sufficient for a tax competition-led country simply to lower its AECTR or for a government expenditure-led one to raise its AECTR. What also matters, when one considers the paradox of tax competition, is the *extent* to which a country lowers or raises its AECTR. Hence, policymakers may recognise the tax regime of their country but still be considered imprudent, as we have defined it the term, if they fail to recognise the larger coordination problem and its implications.

4.5 Implications of the Kaleckian tax competition model

Having built and explained our theoretical model, let us now explore its relation to real-world corporate tax developments.

4.5.1 Multipliers given current low rates of corporate tax around the world

Firstly, note the interesting asymmetry in the fact that, for recent low values of corporate tax rates, tax competition-led countries face multipliers greater than one (in absolute value) whereas government expenditure-led countries face multipliers of less than one in absolute value. To illustrate this point—and with reference to condition 4.18—consider a country that is so "strongly" tax competition-led that $1-(s_{\pi,i}\Pi_i/\rho_i\tau_f I_m) \approx 1$. Even this strongly tax competition-led country would have to decrease its AECTR by around 3.2 percentage points to compensate for the decreased demand caused by a fall in the rest of the world of 1 percentage

point, given $\tau_f = 0.25$ and $\tau_i = 0.2$. Clearly, if τ_f and τ_i fall any lower, or if a country is "weakly" tax competition-led, the multiplier will be even higher. Strongly government expenditure-led countries, on the other hand, may boost u_i^* with increases of domestic AECTRs that are mere fractions of the size of the fall in τ_f, given the current low distribution of AECTRs around the world.

Relatedly, it should also be noted that countries may become "trapped" in the sense that a demand-boosting decrease in the domestic AECTR is simply not implementable. This is especially true for "weakly" tax competition-led economies, where $\rho_i \tau_f I_m$ is only slightly greater than $s_{\pi,i}\Pi_i$, and when τ_i and τ_f are sufficiently close to zero. In this case, the multiplier may be so large that to implement it would require negative AECTRs. For example, suppose that in a given period $\tau_i = 0.18$, $\tau_f = 0.2$, and $(s_{\pi,i}\Pi_i / \rho_i \tau_f I_m) = 0.8$. The resulting multiplier of 20.5 means that a subsequent fall in τ_f of one percentage point would need to be met with a fall in the domestic rate of 20.5 percentage points, which is an impossibility (without subsidies). If an economy becomes trapped in this sense, it must suffer the negative effects of changes in τ_f on demand without being able to reduce τ_i further to counteract such effects.[30]

4.5.2 Economic size matters

One clear prediction from the Kaleckian tax competition model is that countries with profit levels that are small compared to I_m—typically poorer and/or physically smaller countries—are more likely to be tax competition-led and hence compete more aggressively on AECTRs than larger economies. There is considerable evidence to suggest this prediction holds water.

Preliminary evidence can be seen in Figure 4.7. Graphed are the statutory corporate tax rates of the 18 highest profit level OECD countries versus the 18 lowest profit level OECD countries for the years 1981 - 2019.[31] We see that the smaller OECD economies lowered rates more aggressively since the end of the 1980s and have undercut the larger economies by 5.2 percentage points on average since 1990. While this may not be a conclusive test, more rigorous econometric studies such as Winner (2005), Chatelais and Peyrat (2008), and Crabbé and Vandenbussche (2009) have all found evidence in various forms that supported the hypothesis that small economies lead in the tax competition race.

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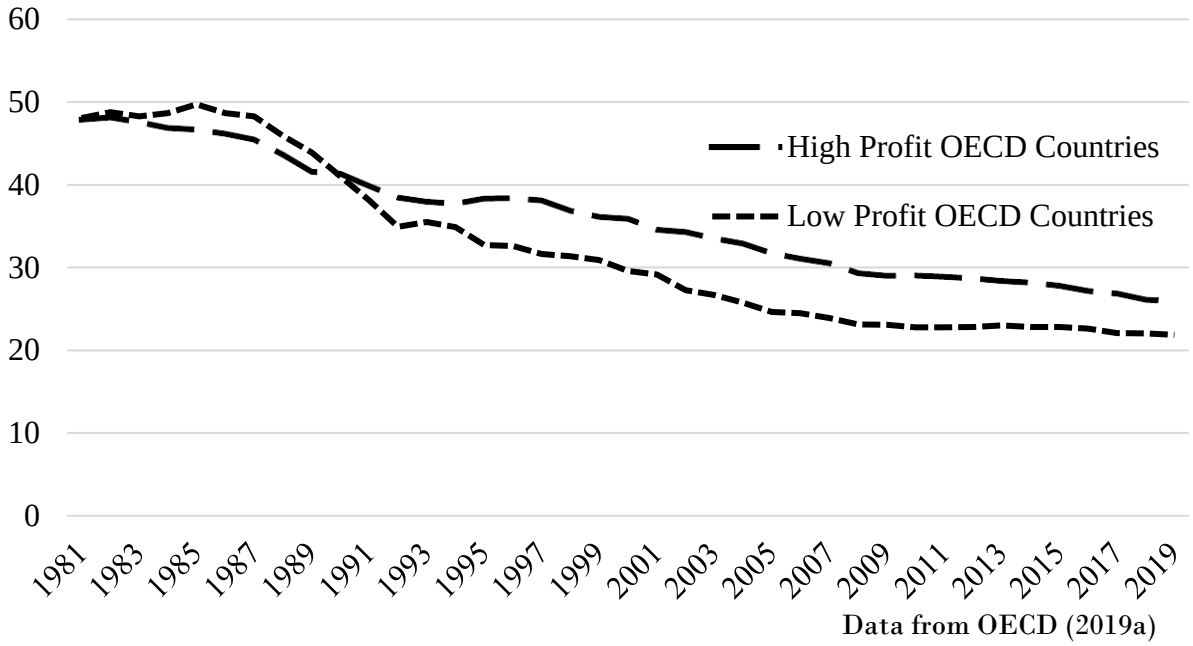
[30] While τ_f could theoretically fall so low that country *i* becomes government expenditure-led (since now $s_{\pi,i}\Pi_i > \rho_i \tau_f I_m$ at the sufficiently low value of τ_f) and thus no longer trapped, it is unclear how rapid or automatic such a "release" would be. Two factors might serve to keep $s_{\pi,i}\Pi_i < \rho_i \tau_f I_m$. First, Π_i will be endogenously lowered in every period that the tax competitive country *i* is trapped. Second, the size of total worldwide greenfield FDI may continue to grow (exogenously) at its rapid rate. In addition, if a sufficient number of countries become trapped and cease to change AECTRs, then τ_f will cease to fall as quickly too. Yet this depends on assumptions about how "prudent" policymakers would act at or near the "bottom" of the race. Rather than make premature conclusions here, we will note the question and leave it as the subject of further work.

[31] Countries' profit levels were ranked by gross operating surplus data from the OECD (2019a). Switzerland has been defined as a low profit country because its tax-setting powers are largely devolved to its cantons, meaning that the relevant profit variable should, in fact, be at the canton-level, which is obviously far smaller than that of the nation-level.

Figure 4.7 *Average Statutory Corporate Tax Rate (%): High vs. Low Profit Level OECD Countries, 1981 - 2019*



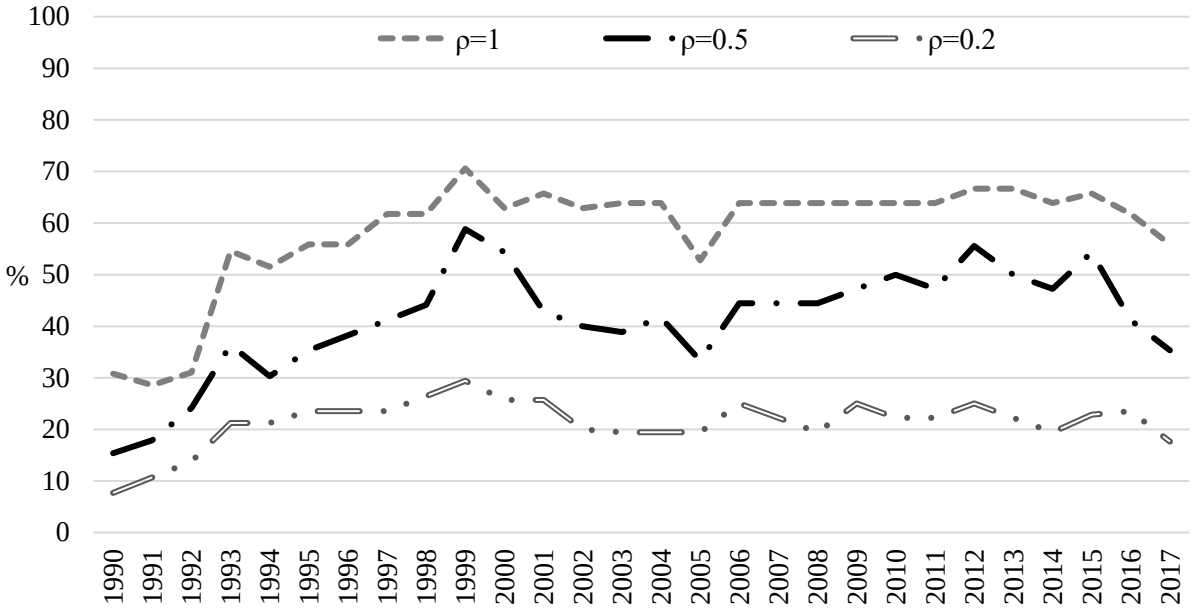
4.5.3 The imprudence of the race to the bottom

While small economies may be more likely to lead the race to the bottom, this does not necessarily imply they do so prudently—that is, in a way that boosts effective demand. Furthermore, questions must be raised concerning why larger economies are also racing to the bottom. Are all the OECD countries really tax competition-led? If so, can they all truly avoid the paradox of tax competition and boost demand through lowering AECTRs?

We can roughly estimate the tax regime of each of the 36 OECD countries in the following way. Using gross operating surplus data for Π_i, data on the average OECD statutory rate for τ_f, and adopting the convention of defining greenfield FDI (I_m) as the residual of total FDI minus merger and acquisition FDI, we can compare the size of $s_{\pi,i}\,\Pi_i$ to that of $\rho_i \tau_f I_m$ in a crude, but nevertheless informative way. Clearly, we still need to give values to $s_{\pi,i}$ and ρ_i. For simplicity, we will assume all countries under consideration have a marginal propensity to save from profits of 0.8. Since ρ_i is relatively abstract, we will provide various values to see how sensitive our results are to changes in this parameter. We allow ρ_i to equal 1, 0.5 and 0.2 for all countries for every year in the sample.[32] The period of analysis, 1990 – 2017, is determined by the data availability of I_m in particular, with estimates derived from FDI data

[32] There is no reason to suppose ρ_i will be truly equal across countries and across time, but, again, we define it as such because it at least allows for an intuitive grasp of the relative magnitudes of the economic forces.

Figure 4.8 *Estimated percentage of OECD countries that are tax competition-led for different values of ρ, 1990 - 2017*



taken from UNCTAD (2018).[33] Data on Π_i and τ_f is taken from OECD (2019a). Since data on gross operating surplus is not available for the first few years of the sample period for typically smaller countries—those more likely to be tax competitive—our sample may suffer a slight selection bias in the first few years.[34] Rerunning the exercise for the sample of countries with full data from 1990, however, shows the same trends as we find below, suggesting that any bias is unimportant for our purposes.

Figure 4.8 shows the percentage of the 36 OECD countries that are tax competition-led ($\rho_i \tau_f I_m > s_{\pi,i} \Pi_i$) in a given year between 1990 and 2017 for different values of ρ_i. In each case, there is a rise in the percentage of countries with an incentive to compete on taxes after the early 1990s. Only for unrealistically high values of ρ_i is there a majority of countries that may have an economic rationale for racing to the bottom. While far from conclusive, Figure 4.8 throws into question the prudence of the race to the bottom, or at the very least the economic basis for *large* economies to race to the bottom.

We can take our investigation to its natural conclusion now by considering the coordination problem that we refer to as the paradox of tax competition. Given a fall in τ_f, tax competition-led countries must simultaneously *decrease* AECTRs by a country-specific multiple of this fall in order to realise the positive effects on demand. Similarly, government expenditure-led countries must *increase* AECTRs above a country-specific multiple of this fall

[33] Such data excludes financial centres in the Caribbean to limit the usual distortions to FDI measures.

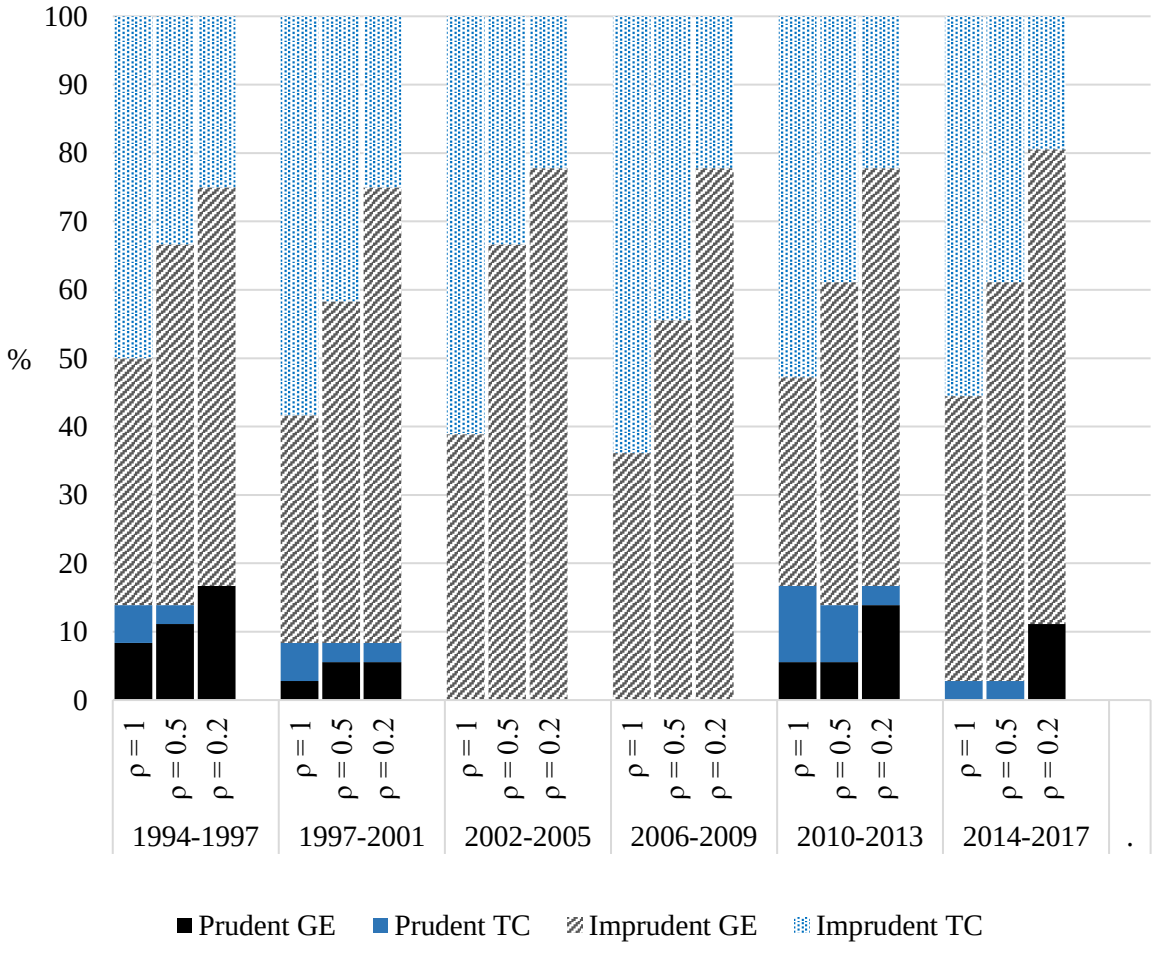
[34] First year of data availability is as follows: 1991 - Poland; 1992 – Latvia; 1993 – Czechia, Estonia, Lithuania, and Slovakia; 1995 – Chile, Hungary, and Israel.

to compensate for the demand-hindering effects of other countries becoming more tax competitive.

To estimate the empirical relevance of this phenomenon, we use the conditions as derived in inequalities (4.23a) and (4.23b). This implies comparing the actual change in the domestic AECTR to the actual change in the AECTR of the rest of the world times the country specific multiplier during the period. If $d\tau_i < \mu_i \, d\tau_f$ for a tax competition-led country, then we shall call it "prudently tax competition-led" and "imprudently tax competition-led" otherwise. If, on the other hand, $d\tau_i > \mu_i \, d\tau_f$ for a government expenditure-led country, it will be termed "prudently government expenditure-led" and "imprudently government expenditure-led" otherwise.

For analytical clarity, we analyse six intervals of four years from 1994 until 2017 for the 36 OECD countries. This is also perhaps more realistic, to the extent that MNC investment decisions are based on tax developments in a period longer than one year. To estimate μ_i, we define changes in the domestic and rest of the world corporate tax rate as the change over these

Figure 4.9 *Percentage of OECD countries that prudently or imprudently changed corporate tax rates in a given four year period, given the tax regime for different values of ρ*



four year intervals and τ_i and τ_f are defined as the average over each interval. Lastly, the tax regime, as determined by $s_{\pi,i}\,\Pi_i/\rho_i\tau_f I_m$, is also given by the average value over the interval. Again, we set $s_{\pi,i} = 0.8$ and give different values for ρ_i to get at least a general understanding of the possible empirical relevance of the tax coordination problem.

The results of this exercise, displayed in Figure 4.9, suggest that the vast majority of countries failed to boost demand by changing domestic AECTRs over this period. This conclusion is robust to our value of ρ_i and the period in question. The value of ρ_i changes the percentage of tax competition-led countries relative to those that are government expenditure-led, but has seemingly negligible effects on the relative size of those that acted prudently to those that did not. Even allowing for the possibility of tax competition-led demand, our results suggest the race to the bottom is far removed from prudent policymaking, as we define it. For the most part, it has effectively dampened demand around the world.

4.5.4 Policy implications

A natural question that arises is how policymakers could be so imprudent with regards to the setting of AECTRs. One part of the answer presumably lies in unfounded economic theory or forms of regulatory capture or influence. Another part of the answer may lie in the fact that the process of tax competition described in this paper is one of high if not intractable complexity, giving rise to a form of increased fundamental uncertainty. Estimating the tax regime of a country is difficult enough without then trying to understand how other countries around the world may also simultaneously change corporate tax policies.

In response to the tax competition problem, there are two main policy recommendations worth considering. First, multilateral tax coordination could reflate AECTRs around the world and establish a minimum rate that should not be undercut thereafter. Increasing AECTRs collectively allows for the positive government expenditure effects without suffering the negative tax competition effects, since the rise in τ_f offsets the fall in $(1-\tau_i)$ seen in the modified investment function seen in equation (4.15). If multilateral action is deemed impossible to achieve, individual countries can at least change the way corporate taxes are collected. For example, Zucman (2019) argues that the consolidated, worldwide profits of MNCs should be taxed based on where sales are made, not where subsidiaries are headquartered or production is located. Such an apportionment mechanism removes the incentive that gives rise to the race to the bottom problem in the first place while allowing corporate tax rates to rise and inequality to be addressed. To ensure the fairness and effectiveness of such an apportionment mechanism, however, international coordination may still be of great value.

In any case, even if such tax reforms are not implemented and current tax systems remain, our model suggests a number of sufficiently large countries need not accept current received wisdom that AECTRs should be minimised. Large economies in particular, it seems, would do well to realise the benefits of increased corporate taxes. To better contextualise what is meant by "large", we find in our analysis that countries with a profit level equal to or greater than that of Austria (if $\rho_i \leq 0.5$) or the Netherlands (if $\rho_i \leq 1$) are government expenditure-

led.[35] Relatedly, claims that the 2017 tax cut in statutory corporate tax from 35% to 21% in the United States—the country with the highest profit level in the world—will increase growth should be viewed with a great deal of scepticism in light of our model.

4.5.5 Limitations

Before we conclude, a few limitations ought to be stressed. Of course, the empirical approach adopted is not rigorous, but nor is it held to be as such. Gross operating surplus and worldwide greenfield FDI estimated by the residual method may be poor proxies for the desired variables. Yet, it is unclear what alternative proxies would be superior. Such an approach at least allows a first approximation of the forces at play.

Additionally, we have simply assumed that changes in statutory rates reflect changes in effective rates, and that there exists one effective rate that is relevant for all MNCs. This is, of course, a large simplification. In particular, cases studies like that of the Republic of Ireland show us that the effective rate for American-owned MNCs based in Ireland are on average far lower than that of domestic firms and vary significantly (Stewart, 2018). Our analysis here does not take into account the significance of so-called "sweetheart deals", tailored tax arrangements amounting to customised effective tax rates for each MNC, that allowed, in the case of Ireland, what has been dubbed "industrialisation by invitation" (Barry and Ó Fathartaigh, 2015). Hence, the limitations of our approach imply a country like Ireland may still have engaged in "prudent" tax competition, regardless of the results found here. However, Ireland is likely to be the exceptional case here since Markle and Shackelford (2009) find that in most cases effective tax rates on domestic firms are similar to those faced by MNCs operating in the same country.

Furthermore, we have not considered the fact that AECTRs may also be lowered to prevent domestic firms from moving activity abroad. This counterfactual scenario is not captured by our empirical approach, since no such data (on domestic activity that would have shifted elsewhere had AECTRs not been lowered) exists. Thus, a greater number of countries than is estimated here could have been competing on taxes "prudently", given current worldwide corporate tax systems.

However, such a kind of tax competition only further emphasises how far from ideal current corporate tax developments are. The only benefit of lowering AECTRs in such a scenario is to keep currently domestic firms where they are, while the cost is felt in reduced tax revenues. In other words, lowering AECTRs in such a scenario becomes a matter of minimising the negative effect on demand rather than boosting demand. Compared to one of the superior alternatives prescribed above, where countries cooperate to tax MNCs on an international basis, the incentive for a domestic firm to internationalise operations is reduced or removed, and policymakers are thereby freer to raise revenues and demand through higher AECTRs.

Turning our attention away from the empirical matters and back to our theoretical model, a few points are in order. Firstly, unlike in chapter two, we supposed here that the other components of demand are unaffected by tax competition and FDI inflows. This is a large simplification. Net exports in particular are likely to be positively affected by the presence of

[35] Estimated using average values over 1990 – 2017 for $s_{\pi,i}\,\Pi_i - \rho_i \tau_f I_m$, assuming again that $s_{\pi,i} = 0.8$.

MNCs. Data from the OECD (2019b) Activity of MNCs database shows that MNCs are responsible for more than 75% of all exports in Singapore, Ireland, Hungary, Switzerland, and China.[36] Hence, MNCs could also boost demand through the net exports channel, and not just the investment channel. However, one must also keep in mind that a part of net exports due to MNCs is, in fact, the profits of MNCs that are to be repatriated out of the domestic economy. Thus, the extent to which increased net exports due to MNCs boost real domestic demand is not obvious.

Lastly, also unlike chapter two, we have ignored the thorny issue of profit shifting in this chapter. However, to the extent that profit shifting lessens the influence of relative AECTRs on the location of MNCs, we would expect that including this phenomenon would only serve to show the race to the bottom is even more imprudent than has been suggested here. Tax competition for paper profits, not real capacity-creating investment, is far more likely to be a winner-takes-all phenomenon, with disproportionate gains for the few nations whose AECTRs are zero or thereabouts (*cf.* Tørsløv et al., 2018). In any case, even if countries manage to address the threat of profit shifting, they must still be wary of the problems of tax competition explored here. Solving the problem of tax competition for paper profits does not necessarily solve the problem of tax competition for the real investment of MNCs.

4.6 Conclusion

The purpose of this paper was to work towards a new theory of tax competition that is compatible with post-Keynesian thinking and use it to understand the causes and consequences of the global race to the bottom. To this end, the paper makes some novel contributions. Perhaps the most important takeaway is that, while it may be possible in theory to boost demand through lower AECTRs in a demand-led economy, it is very difficult to do so in practice due to the coordination problem. Just as Blecker (1989) pointed out that multiple apparently profit-led countries striving for export-led growth via wage restraint is counterproductive, our theory suggests an analogue holds true for tax competition-led countries. This paradox of tax competition together with the failure of government expenditure-led countries to increase their AECTRs has meant that, for the most part, the real winners of the race to the bottom are the MNCs that have seen their tax bills shrink as their influence—implicit or otherwise—over policymakers grew.

Our findings suggest policymakers would do well to rethink corporate tax policy. Excuses for inaction should be regarded with healthy scepticism. Even if tax coordination is considered politically infeasible—which it need not, given the role and potential of regional blocs—there are still low-hanging fruit that less ambitious countries may pick. Policymakers ought to explore changes in how MNCs are taxed or, simpler still—but for sufficiently large economies only—learn to trust that the effectiveness of tax-financed government expenditure may be greater than the loss attributed to becoming relatively tax uncompetitive.

[36] Using averaged values over the 2008-2016 period.

5. Profit-led in Effect or in Appearance Alone? Estimating the Irish Demand Regime Given the Influence of Multinational Corporations

Abstract

Most studies on the demand regime of Ireland tend to find it is profit-led. However, these studies use conventional national accounts statistics, which are grossly distorted in Ireland. Since the activities of multinational corporations (MNCs) drive real demand on one level and severely distort conventional macroeconomic data on another, the possibility of bias due to omitted variables and measurement error arise. This paper summarizes the real and distortionary effects of MNCs in Ireland, and then adjusts and controls for these effects in an econometric estimation of the underlying Irish demand regime. It also addresses the threat of simultaneity bias by employing a three-stage-least-squares approach. Ireland is found to be wage-led once the influence of MNCs is taken into account. Moreover, the average effective corporate tax rate (AECTR) on foreign affiliates in Ireland is found to be statistically significant in explaining investment. These results, alongside indicative foreign affiliate statistics, support the view that the underlying Irish economy is both wage-led and "tax competition-led" (Woodgate 2020), where a lower AECTR has a net positive effect on aggregate demand. It is contended that this beggar-thy-neighbor, tax competition-led regime helps explain why Ireland is profit-led in appearance rather than in effect.

5.1 Introduction

Consideration of multinational corporations (MNCs) is becoming increasingly important for the analysis of national economies. Perhaps nowhere more so than in the Republic of Ireland, where the activities of MNCs in Ireland drive real demand on one level and, on another, severely distort conventional national accounts statistics. This paper describes how the growth of tangible investment, employment, and corporate tax revenues in Ireland is largely fueled by foreign affiliates. At the same time, certain MNC activities, mostly related to tax planning, inflate a number of key macroeconomic indicators like GDP, net exports, and the profit share, increasingly decoupling these measures from the underlying Irish economy.

The dual nature of the effects of MNCs in Ireland presents a problem for the empirical estimation of how changes in income distribution affect aggregate demand and income in the post-Kaleckian model pioneered by Bhaduri and Marglin (1990) and Kurz (1990). Failing to adjust and control for the effects of MNCs likely leads to bias due to measurement error and omitted variables. This is best seen with a couple of examples. With the inflated profit share of GDP, it is likely that too much of the variation in consumption is ascribed to the growth of profits. Additionally, since a lower average effective corporate tax rate (AECTR) may increase green-field foreign direct investment (FDI) *and* increase the value of profits artificially booked in Ireland, failing to control for the AECTR likely means that estimates of the effect of the profit share on investment suffer from omitted variable bias. Given that the majority of studies on

Ireland's demand regime find it to be profit-led (Stockhammer & Stehrer 2011, Kinsella 2013, Onaran & Obst 2016, Oyvat et al., 2020) but generally do not adjust and control for the influence of MNCs, questions about the internal validity of such results naturally arise. Do pro-capital changes in distribution between Irish workers and capitalists truly fuel demand once the real and distortionary effects of MNCs are taken into account?

The demand regime of Ireland is estimated in this paper using two different datasets. The first is comprised of the usual or "conventional" national accounts data (GDP, wage share of GDP, etc.) that are subject to distortions, whereas the second, the "modified" dataset, is made up of related variables that are stripped of MNC-related distortions as much as possible (modified GNI, wage share of modified GNI, etc.). Moreover, additional MNC-related control variables are included in the regressions that use the modified dataset, such as measures of foreign affiliates' AECTR (to control for any tax-sensitive greenfield FDI inflows) and profitability (to control for the effects of profit shifting on net exports). For each dataset, two estimators are employed, namely the ordinary least squares (OLS) and three stage least squares (3SLS) estimators. The 3SLS estimator is used in attempt to address the endogeneity problem inherent in demand regime estimation (Onaran & Obst 2016, Blecker et al. 2020) as well as the possibility of cross-equation correlation of errors. Ireland is found to be profit-led in both OLS and 3SLS approaches when using the conventional data, but wage-led in both OLS and 3SLS approaches that adjust and control for the effects of MNCs. The estimator used is found to affect the size of the estimates, but not the signs.

Despite the finding that the underlying Irish economy is wage-led, pro-labor distributional changes do not seem to be the main factor behind the rapid growth seen in Ireland since the 1990s. This follows since the modified wage share, which is adjusted for some of the main distortions due to MNCs, has remained relatively stable over the last few decades, if not declined slightly. This paper supports the view that the phenomenal growth of Irish national income has been mostly driven by the real and tangible effects of foreign affiliates in Ireland. Since the main differentiating factor that attracts MNCs to Ireland is its AECTR on foreign affiliates, which appeared to be as low as 4.5% as early as 1982, it is argued that Ireland is "tax competition-led" (Woodgate 2020), where a reduction in the AECTR has a net positive effect on aggregate demand. This characterization is supported by the descriptive statistics on foreign affiliates in Ireland, as well as the finding that the AECTR has a statistically significant effect on total Irish investment adjusted for distortions of MNCs.

While the focus of this paper is on Ireland, it also sheds light on the processes of modern globalisation that affect all countries. Since tax competition is a beggar-thy-neighbor phenomenon, the gains of Ireland to be described in this paper cannot be separated from the losses accrued elsewhere. Especially by enabling the profit shifting of MNCs, Ireland's tax competition-led strategy appears to feed off the same process that leads to higher post-tax inequality in the countries where the shareholders of these foreign MNCs reside. Furthermore, while Ireland's demand regime is rather exceptional, the issues encountered in its econometric estimation may nonetheless be relevant for the estimation of the demand regimes of many other countries.

The paper is structured as follows. Section 5.2 summarizes the channels through which foreign affiliates appear to have driven Irish demand with reference to the data that are least

subject to distortions. It also details what these distortions are and how they came to be. Section 5.3 devises a modified wage share measure that is held to better reflect the true distribution of income between Irish laborers and capitalists. A brief summary of the existing literature on the Irish demand regime is offered and the concerns around using conventional data are outlined. Section 5.4 describes the post-Kaleckian model used in this paper, explains how the data are adjusted and controls are devised, and details the empirical approach taken before providing the results of all regressions used in determining Ireland's demand regime. Section 5.5 discusses these findings and draws policy implications before section 5.6 concludes.

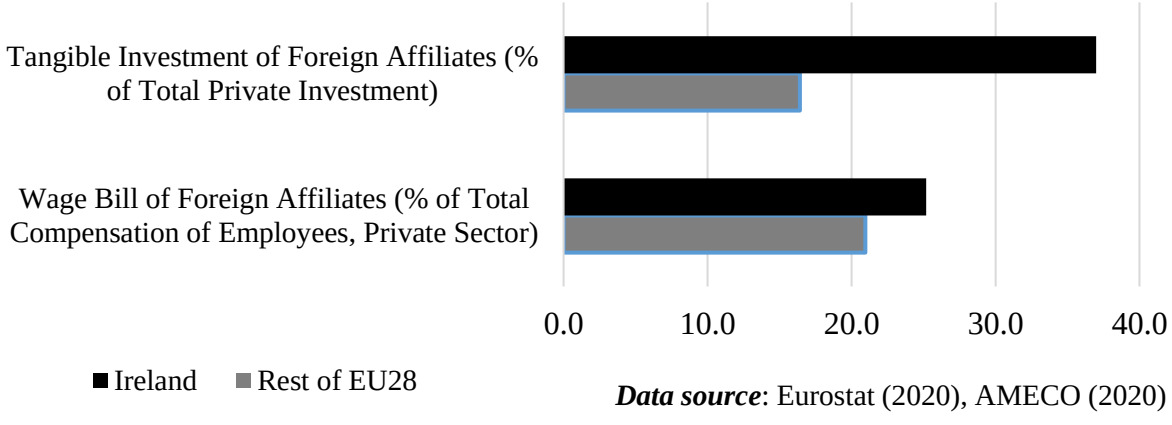
5.2 Real and Distortionary Effects of Foreign MNCs in the Irish Economy

5.2.1 The "Celtic Tiger": How Foreign MNCs Drive Irish Aggregate Demand

Foreign MNCs in Ireland drive aggregate demand through a number of channels, the most direct of which is the green-field FDI channel. Foreign affiliate statistics (FATS) from Eurostat (2020) show that the tangible investment of non-financial foreign affiliates' accounts for a substantial 37% of total private gross fixed capital formation in Ireland. This is more than in any other European Union country, and more than double the average of the rest of the EU, as is shown in Figure 5.1.

Likewise, the increase in size and number of foreign affiliates in Ireland has had a strong positive effect on Irish net exports. A large part of the measured increase in Irish net exports is merely distortionary in the ways to be described below, but another part reflects value added that has genuinely taken place in Ireland. While the profits resulting from these genuine MNC exports are often repatriated out of Ireland, doing little for Ireland's underlying demand regime, the input costs in the production of these exports do benefit Irish demand. In particular, the employment and wages of Irish nationals appear to be boosted by foreign MNCs that serve foreign markets from Ireland. The Eurostat data, also displayed in Figure 5.1, suggest that 25.2% of the compensation of employees in the private sector in Ireland was paid by foreign affiliates—4.2 percentage points higher than in the rest of the EU. Though this measure is higher in a few central and eastern European counties (between 30% and 35% in Czechia, Hungary, Romania, and Slovakia), MNCs tend to locate in these countries to avail of the

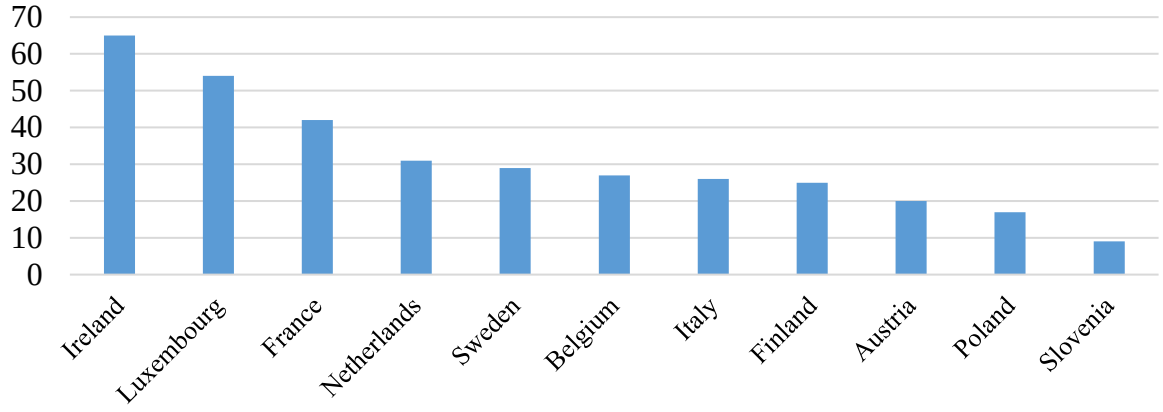
Figure 5.1 *Tangible Investment and Wage Bills of Non-Financial Foreign Affiliates in Ireland vs Rest of the EU, Average Values over 2014-17*



Data source: Eurostat (2020), AMECO (2020)

relatively cheap labor. Comparing the wage bill of foreign affiliates in Ireland with that of nations with wage rates similar to those found in Ireland makes for an even starker contrast.

Figure 5.2 *Percentage of Corporate Tax Revenue Paid by MNEs in Selected EU Nations, 2016*



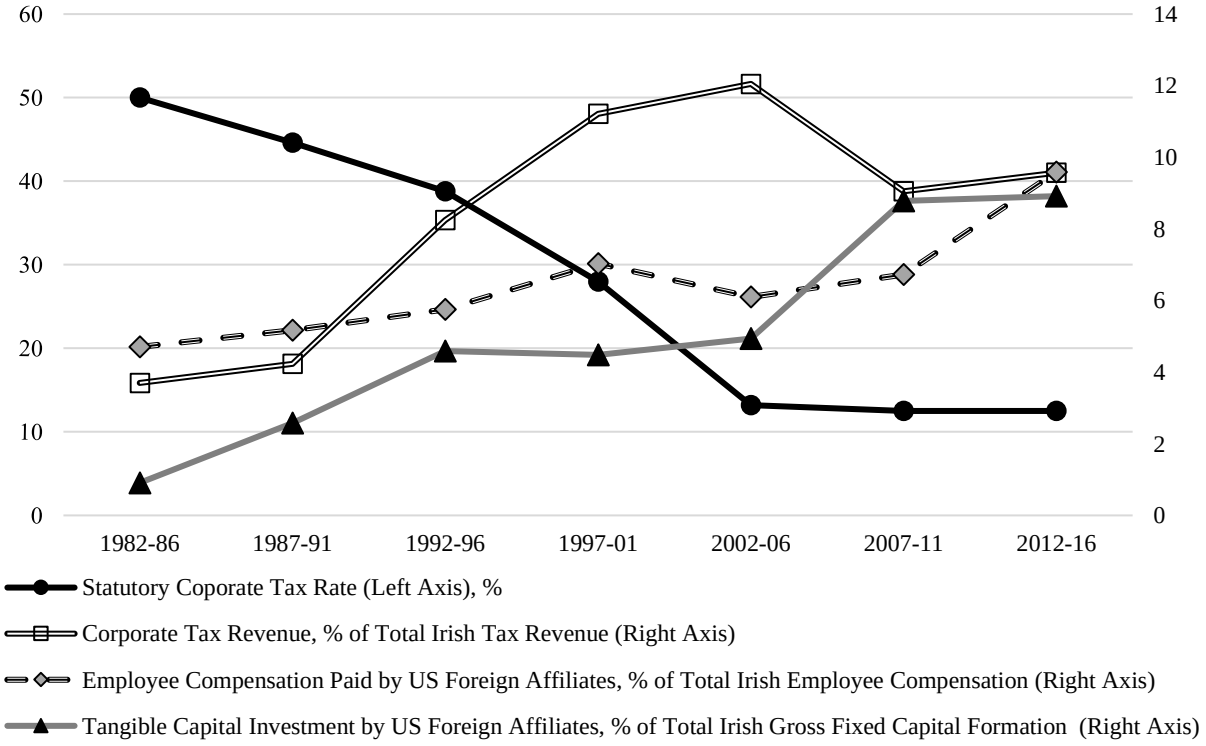
Data source: OECD (2020, p.40)

A third indicator of what fuels demand and thereby growth in the Irish economy is implied by the work of Tørsløv et al. (2018). The authors estimate that of the $616bn of profits shifted by MNCs around the world in 2015, $106bn (17.2%) ended up in Ireland, making Ireland the number one tax haven destination for MNCs. Attracting such phenomenal profits with a low effective corporate tax rate results in a much-broadened tax base in Ireland and thereby high corporate tax revenues (ibid., p.26). Related evidence for this phenomenon can be seen in Figure 5.2, with data from the OECD (2020, p.40), where it is found that 65% of all Irish corporate tax revenues in 2016 were paid by MNCs, far exceeding the same metric in other EU countries for which data are available. Government spending of these increased tax revenues is the third way in which Ireland may enjoy real tangible benefits from the beggar-thy-neighbor strategy of tax competition.

To examine the link between lower corporate tax rates and the growth of these components of demand, longitudinal data is needed. Unfortunately, the Eurostat (2020) FATS database extends only as far back as 2008 for Ireland (with a number of gaps in the data). The data used in Figure 5.2 is an outcome of the recently concluded OECD (2020) Base Erosion and Profit Shifting (BEPS) project. As of the time of writing, only data for 2016 is available. Fortunately, survey data from the United States Bureau of Economic Analysis (BEA) on the activities of US MNCs abroad are available on a long-run basis (BEA, 2020). The survey, which is mandatory for the large and representative sample of US MNCs chosen, has been conducted on an annual basis since 1982, with further benchmark surveys conducted in 1950, 1957, 1966, 1970, and 1977. The resulting dataset offers detailed and wide-ranging information on the operations of the affiliates of US MNCs on a country-by-country basis, from which one can understand how the contributions of US MNCs toward investment, compensation of employees, and tax revenue evolved over time in Ireland. Since foreign MNCs in Ireland are mostly US-owned (IDA, n.d.), the data should reasonably representative of all foreign MNCs in Ireland.

The BEA (2020) data on the tangible investment, wage and tax bills of US foreign affiliates in Ireland are expressed as a percentage of the national total gross fixed capital formation, compensation of employees, and tax revenue (AMECO 2020) and is displayed in Figure 5.3. These three series are plotted alongside the statutory corporate tax rate (OECD 2020) using, for ease of interpretation, five-year averages over the period of 1982 until 2016. As expected, the contributions of US MNCs to Irish investment, wages, and tax revenues are all negatively correlated with the falling statutory corporate tax rate. Though Figure 5.3 is, of course, not proof of causation, it nonetheless supports the widely held view that low corporate tax rates helped give rise to the "Celtic Tiger" period of high growth rates in the mid-1990s to mid-2000s and likely continue to drive real demand and income growth in Ireland.

Figure 5.3 *Falling Corporate Tax Rates (Left Axis) and Rising Corporate Tax Revenues, Wage Bill and Investment due to US MNEs in Ireland (Right Axis), Five-Year Averages between 1982 and 2016*



Data sources: BEA (2020), AMECO (2020), OECD (2020)

The rather unique Irish demand regime relates most strongly within the post-Keynesian literature to what is termed a "tax competition-led" economy in chapter four (Woodgate, 2020). Based on a neo-Kaleckian model with an additional tax-sensitive green-field FDI component in the investment function, a tax competition-led regime is one where a decrease in the average effective corporate tax rate (AECTR) has a net positive effect on aggregate demand. The results of the theoretical approach developed in Woodgate (2020) suggest that an economy may be tax competition-led if two conditions are met. First, the country pursuing the tax competitive strategy must be sufficiently small, so that decreases in the AECTR do not cause much of a decrease in tax revenue from domestic firms compared to the increased inflow of foreign

capital.[37] Second, any decrease of the domestic AECTR must be sufficiently larger than any simultaneous fall in the foreign AECTR, otherwise the fall in the domestic rate fails to distinguish the domestic economy as a *relatively* low-tax jurisdiction. Ireland, being a small nation and early pioneer in developing the tax competitive strategy, may satisfy these two conditions.[38]

Besides offering this indicative data, one goal of this paper is to econometrically test whether reductions in the AECTR have significant and positive effects on investment in Ireland. Taken alone, an affirmative result would not be sufficient to confirm that Ireland is truly tax competition-led, since the effects on the other components of demand would also need to be considered. However, such a result would nonetheless support the hypothesis of tax competition-led demand growth. Before empirically analyzing these aspects of how demand is generated in Ireland, however, one must account for the many varied distortions that plague the Irish national accounts.

5.2.2 "Leprechaun Economics": How Foreign MNCs Distort Irish National Accounts

In the preceding section, care was taken to ensure that all data used reflect the genuine and tangible contributions of foreign MNCs to Ireland's economy. Measures of gross value added, gross operating surplus, exports, imports, and total investment (i.e. including *intangible* capital goods) were avoided for the simple fact that they have become increasingly divorced from the economic reality of Irish nationals.[39] These distortions have become most substantial in recent years and abundantly obvious when real GDP growth was recorded as being over 25% in 2015.

Of course, it has long been known that in countries with a high degree of MNC activity, GDP overstates the true income level of the residents of such countries. Yet Irish GNI, it transpires, is also inflated by the activities of foreign MNCs. Corporate inversions and the depreciation of MNC assets, particularly intellectual property (IP) and aircraft located or registered in Ireland, has been shown to inflate GDP, GNI and other conventional statistics significantly. In response, the central statistics office (CSO) of Ireland now publishes *modified* gross national income, consumption, gross fixed capital formation, and current account balance measures (CSO 2020). These modified measures—differentiated from the conventional metrics by an asterisk (e.g. modified GNI is denoted GNI*)—strip away the effects of re-domiciled corporations and these kinds of depreciation. Since 2016, data has been published by the CSO on modified GNI on an annual basis and modified domestic demand on a quarterly basis. The CSO has also since extended these series as far back as 1995. A comparison of the data in the conventional and modified series shows that the distortions caused by the depreciation of MNC assets and re-domiciled companies appear negligible in and around 1995, implying the two series may be stitched together rather straightforwardly.

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[37] The trade-off between higher MNE investment and higher corporate tax revenues is weakened or non-existent if, as Woodgate (2020, p. 532) details with reference to Ireland, the government manages to differentiate between domestic and foreign firms when setting AECTRs.

[38] However, the model in Woodgate (2020) does not account for profit shifting. Given that shifted profits may be taxed and spent, tax competition-led demand may be achieved in ways not fully captured by these conditions.

[39] In fact, national gross fixed capital formation was used as the denominator in Figures 5.1 and 5.3, which includes some of these inflating distortions, meaning that, if anything, the contribution of foreign MNEs to Irish investment has been underestimated in these figures, especially in recent years.

Unfortunately, however, there are further sources of distortion that are more difficult to correct. A first issue to consider is the effect of profit shifting on the Irish national accounts. Given Ireland's role as a "conduit" tax haven, MNCs find it worthwhile to establish subsidiaries in Ireland to hold and shield otherwise taxable income from the country of the parent or other affiliated company or route such income to traditional "sink" tax havens, in which corporate profits are untaxed.[40] To enable such aggressive tax planning, MNCs must first shift profits arising from sales elsewhere around the world to Ireland. They usually do so by one of three methods (see, for example, Tørsløv et al. 2018, p.13):

1. Transfer mispricing, where intra-group imports into Ireland are at artificially low prices, whereas intra-group exports are as close to the final market price as possible.
2. Intra-group interest payments, where an Irish subsidiary charges artificially high interest rates on loans made to its parent or another affiliate. This method may have the double benefit of allowing for tax deductions in the higher tax rate country of the parent or other affiliate since interest payments are often tax deductible (though tax authorities have clamped down on this practice in some countries).
3. Intra-group royalty payments, where the parent or other affiliates pay the Irish affiliate for the right to use the MNC's intellectual property that is strategically registered in Ireland.

Each method allows for the means to subvert or exploit gaps in the current "pillars of international taxation", as Zucman (2014, p.122) calls them, that are woefully inadequate for the prevention of widespread profit shifting. Profit shifting essentially amounts to accounting trickery that also serves to inflate Irish GVA, profit level and net exports without a proportionate gain in the material wellbeing of ordinary Irish citizens. The only effect on Irish aggregate demand may be the aforementioned indirect effect via increased corporate tax revenues.

One last concern worth mentioning is that of contract manufacturing or "factoryless production", where corporations resident in Ireland essentially hire a third party in, say, China to perform part of the manufacturing process. A product made this way and sold to a consumer in, say, Japan may be recorded as an Irish export in the balance of payments, despite never crossing the Irish border nor worked upon by Irish laborers (Fitzgerald 2018). In the case of foreign-owned MNCs in Ireland, the resulting profits may not accrue to an Irish capitalist either.

If all shifted profits or profits arising from contract manufacturing were repatriated by foreign affiliates out of Ireland in the form of net primary income payments, modified gross national income would not suffer. Indeed, by some indicators it appears that some part of the profits generated in or shifted to Ireland are later routed out of Ireland, as is suggested by the strongly negative correlation between net exports and net primary income in Ireland, displayed in Figure 5.4 (data from AMECO 2020). However, the short-term lag between profits accumulating in foreign affiliates in Ireland (through profit shifting or genuine production) may be, in principle, long enough to affect annual modified measures of national income. Furthermore, the lag between booking and repatriating profits may not be so short-term at all. It may be deemed more advantageous for an MNC to accumulate a cash pile in Ireland than to transfer it out. As the case of Apple shows, such a cash pile can be used as collateral to ensure

[40] For more on the nature and classification of conduit and sink tax havens, see Garcia-Bernardo et al. (2017).

historically low interest rates on loans used to pay out dividends to shareholders and only repatriated when a tax holiday is signed into law (Fernandez & Henrikse 2015).

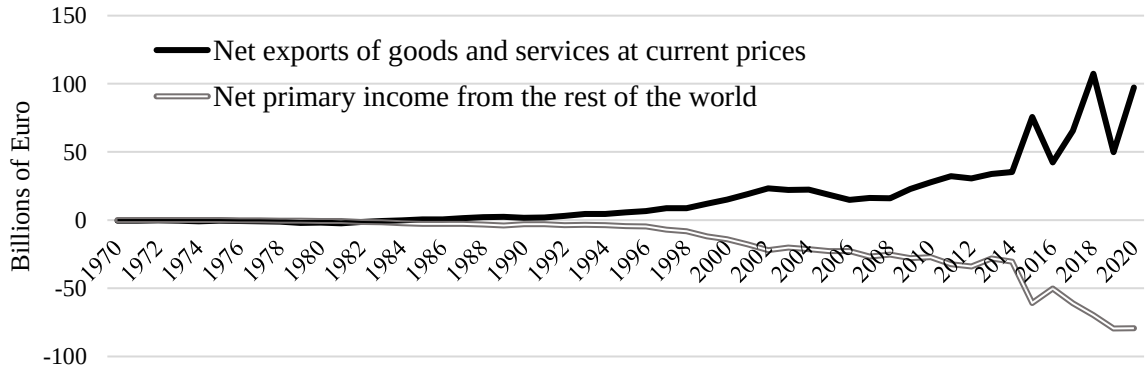
The distortions to the Irish national accounts stem from various activities, though all linked to MNCs, and affect some measures (like trade) much more than others (like consumption). The modified measures introduced by the CSO are a vast improvement, but are likely still subject to distortion. Initial estimates devised by Tørsløv et al. (2018) seem to suggest that profit shifting, for which the modified measures of the CSO are not adjusted, skews even the modified statistics. Importantly for the purpose of this paper, the authors find that the Irish wage share is 58% when correcting for profit shifting using data for the year 2015, in contrast to the official, uncorrected value of 38% (ibid., appendix table C5). The authors also estimate that Ireland's remarkably strong trade surplus in 2015 of 31% of GDP turns into a trade deficit of 5.8% after correcting for profit shifting (ibid., appendix table C5b). Such a stark difference supports the conclusion of Frank (2018), who writes that "at this point, profit shifting by multinational corporations doesn't distort Ireland's balance of payments; it constitutes Ireland's balance of payments."

5.3 Real Income Distribution and Growth in Ireland

An unbiased measure of the adjusted wage share is crucial for understanding how changes in the functional income distribution in Ireland affect aggregate demand. Unfortunately, the measure most frequently used in demand regime estimation and other areas of macroeconomic analysis of Ireland is severely distorted, namely the wage share of GDP (whether at current market prices or at factor cost). While there is no reason to suspect that the compensation of employees is greatly skewed, total gross operating surplus is most certainly inflated, meaning the conventional wage share of GDP is biased downward. Instead, a wage share measure denominated by modified GNI* and further adjusted for profit shifting in particular would be ideal. Such an ideal measure, however, is difficult to estimate, especially on the longitudinal basis needed for demand regime estimation.

While imperfect since it may still be skewed, what is here termed the *modified wage share* can nonetheless be proposed as an improvement upon the conventional wage share of

Figure 5.4 *Net Exports and Net Primary Income Payments in Ireland*



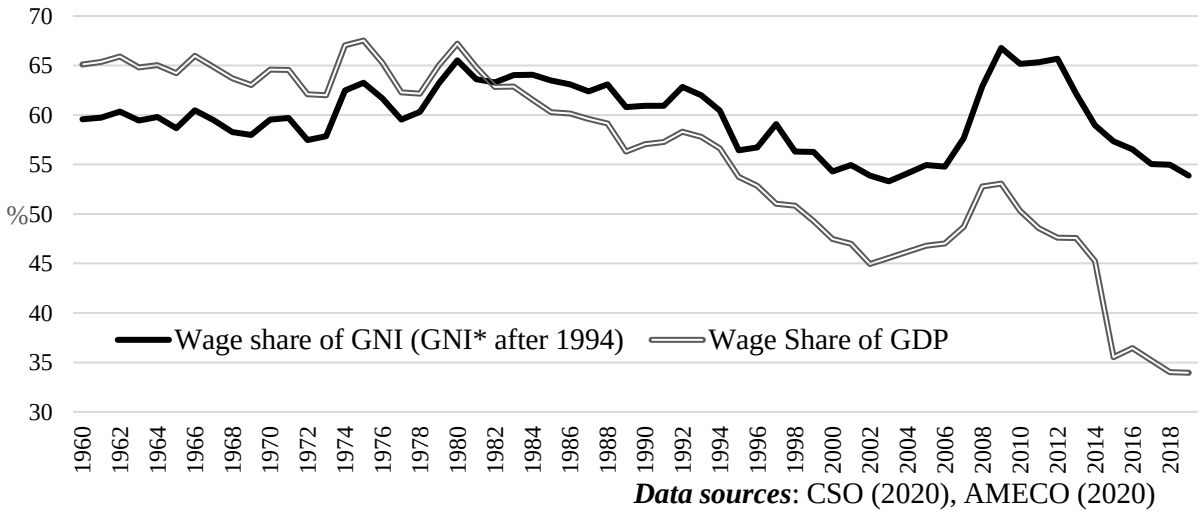
Data source: AMECO (2020)

GDP. As seen in equation (5.1), this measure is defined by the ratio of the compensation of employees in Ireland to GNI*, adjusted to account for self-employed labor. This adjustment, also used by databases such as AMECO, scales the wage bill up by the ratio of persons employed (the number of employees plus the self-employed) to the number of employees.

$$Modified\ Wage\ Share\ (\omega^*) = \frac{Compensation\ of\ Employees}{Modified\ GNI} * \frac{Number\ of\ persons\ employed}{Number\ of\ Employees} \quad (5.1)$$

This new measure is displayed alongside the adjusted wage share of GDP (taken from the AMECO database) in Figure 5.5. For years prior to 1995, for which no data on GNI* is available, conventional GNI is used instead, as there is little difference between the two series at this point anyway. Whereas the trend in the wage share of GDP across these sixty years is clearly and strongly downward, the trend in the wage share of GNI and GNI* is relatively flat. The former falls by more than 30 percentage points over the course of the sample, while the latter rarely deviates from its sample average of 60% by more than 5 percentage points. Clearly, the two measures paint two starkly different pictures.

Figure 5.5 *The Modified Wage Share vs the Wage Share of GDP in Ireland*



Data sources: CSO (2020), AMECO (2020)

5.3.1 Previous Estimates of the Irish Demand Regime

To date there have been at least five studies that have estimated the demand regime of Ireland. As summarized in Table 5.1, these studies tend to find that Ireland is profit-led. The first of these papers, Stockhammer and Stehrer (2011), finds Ireland to be profit-led in models with few lags, but wage-led in models with a longer lag length. However, the authors consider the effect of changes in functional income distribution on private *domestic* demand alone. The rest of the listed papers estimate the effect of changes in functional distribution on the total demand regime, i.e. including the effects on net exports.

Kinsella (2013) is the only work dedicated to estimating the demand regime of Ireland exclusively rather than a list of countries including Ireland. It is, however, fraught with a

number of econometric issues. Firstly, the main period of analysis is of only 12 observations, which likely introduces small sample bias. Second, changes in investment are specified as a function of both changes in the profit share *and* the wage share, prompting concerns of multicolinearity. Third, changes in exports are regressed on one predictor variable alone, namely changes in exports over GNI. Besides issues of simultaneity and omitted variable bias, the economic logic for this specification is unclear. One can also take issue with how the t-statistics and significance levels are reported, or question where the estimates of the propensity to save out of wages and profits come from. For completeness, it is included in the summary of the empirical literature of the demand regime of Ireland in Table 5.1, despite these outstanding issues.

Table 5.1 *Summary of previous empirical work on the demand regime of Ireland*

	Main Period	**Result**	**Caveats**	**Denominator of wage/profit share**
Stockhammer & Stehrer (2011)	1970 Q1 - 2007 Q2	Mixed findings	Domestic demand regime	GDP
Kinsella (2013)	1990 - 2002	Profit-led	Major econometric issues	GVA
Onaran & Obst (2016)	1960 - 2013	Profit-led	Only marginally profit-led	GDP
Oyvat et al. (2020)	1962 - 2011	Profit-led	Only marginally profit-led	GDP
Obst et al. (2020)	1960 - 2013	Wage-led	Includes government sector	GDP

Employing different estimation techniques, Onaran and Obst (2016) as well as Oyvat *et al.* (2020) both find that Ireland is profit-led. Using a vector error correction model, the latter estimate that the long-run effect of an increase in the wage share of one percentage point is a small decrease in private total demand of 0.05%. Onaran and Obst (2016), on the other hand, employ a single-equations, ordinary least squares approach, and find the size of this effect to be of an even smaller size (0.005%).

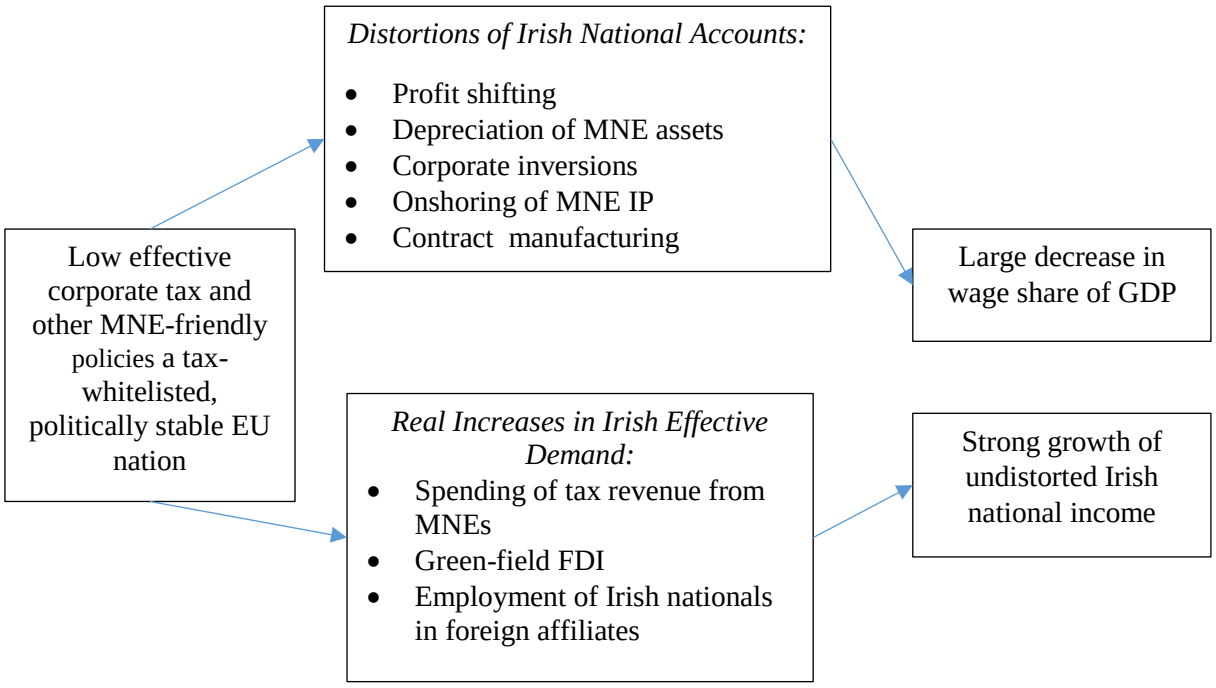
The last study listed in Table 5.1, Obst *et al.* (2020), differs to those prior in both its approach and its result. A focus of this work is the effect of increases in government spending and taxes on demand and the primary budget balance in selected EU countries. As such, it is the only paper here to include a government sector, which taxes labor, capital and consumption at effective rates, and increases its expenditure as national income rises. Perhaps because of this difference in approach, the authors reach the opposite result, namely that the total Irish demand regime is wage-led.

Common to all these studies is the use of GDP or GVA in the denominator of the measure of Irish functional income distribution. Moreover, none of these studies control for the effects or distortions caused by MNCs in Ireland except arguably Obst et al. (2020), which, in modelling public finances, includes a measure of the implicit tax rate on capital which may pick up some of the effects of tax competition. Of course, four of these studies estimate the demand regime not just of Ireland but of a dozen or more countries at once, making it quite understandable why Ireland does not receive the special attention it requires. Nonetheless, improved data are available and additional control variables can be devised, so there is no reason not to attempt to tackle the issues inherent in the estimation of the Irish demand regime.

5.3.2 Profit-led or tax competition-led?

The central hypothesis of this paper is that Ireland's tax competitive strategies give it the mere appearance of being profit-led. Instead, it is possible that the underlying Irish economy is wage-led in principle, but, in practice, is primarily driven by MNCs attracted to Ireland primarily by its low AECTR. In essence, the argument is that Ireland may be both wage-led (pro-labor distributional changes between Irish laborers and Irish capitalists boost demand) and tax competition-led (investment, net exports, and/or government expenditure increase due to MNCs locating in Ireland for tax purposes), rather than profit-led when the effects of MNCs are taken into account.[41] The line of reasoning is summarized in Figure 5.6. From an econometric perspective, the issue is one of bias due to measurement error and omitted

Figure 5.6 *True Irish national income growth may be correlated with, but not caused by, a decreasing wage share of GDP*



[41] If Ireland is wage-led and tax competition-led but not profit-led, increases in Irish demand are associated with increases in Irish labor costs *and* the profits of foreign-owned MNEs, but *not* increases in profits accruing to Irish capitalists. Of course, changes in the AECTR may affect demand indirectly through effects on the distribution between Irish workers and capitalists, but such complications are omitted here for the sake of simplicity.

variables. Unadjusted data are likely to ascribe too much of the variation in consumption to increases in profits. Falling effective corporate tax rates may lead to both higher investment and a higher profit share, thereby confounding estimates of the effect of the profit share on investment when not included in investment regressions. Profit shifting may inflate net exports and attenuate the wage share or unit labor costs, creating similar issues. Each case strongly suggests that more robust data and additional controls are needed to ensure internal validity in the econometric estimation of Ireland's demand regime.

5.4 Estimating the underlying Irish demand regime

5.4.1 Data

Three main sources are used in the compiling of data needed for the econometric analysis of the demand regime of Ireland. First, the conventional Irish macroeconomic data without adjustments for the effects of MNCs is taken from the AMECO (2020) database for the years between 1960 and 2019. Second, CSO (2020) is used for the modified data series described above. Third, data from the BEA (2020) are used to construct two important MNC-related control variables, the average effective corporate tax rate (AECTR) and the ratio of pre-tax profits to labor compensation of foreign affiliates in Ireland. For detailed information on data definitions and sources, the interested reader is referred to the appendix of this chapter.

The approach taken to minimize the distortions due to MNCs is as follows. As a measure of Irish national income, real GNI (1960-1994) and GNI* (1995-2019), described above, replaces GDP.[42] These measures of income serve as the denominators in the modified wage share, as defined in equation (5.1). For the investment of firms, quarterly nominal data on modified gross domestic fixed capital formation (GFCF*) is converted to an annual basis for the years of 1995 until 2019, combined with conventional nominal GFCF for the years prior to 1995, and expressed in 2015 real terms using the GFCF price deflator.

CSO Ireland offers two series on the trade of goods. One series is measured in accordance with the latest European System of National Accounts standards, which uses the principle of "change of ownership" to define trade. As Fitzgerald (2018) explains, this definition implies that subsidiaries in Ireland that contract out manufacturing to another country—often China—will increase the value of Irish trade, even if the produced goods never cross the Irish border. Naturally, this is a less useful definition of trade for the purposes of understanding how increases in the Irish unit labor costs may affect international price competitiveness of producers based in Ireland. Hence, the second series, which measures the trade of goods on a "crossing of the border" principle, is preferred in this study. Combined with the trade in services series to create a measure of total exports and total imports, a few final adjustments are made based on those made by the CSO in their derivation of their modified current account measure. These adjustments are the subtraction of R&D related IP exports and imports (2014-19), R&D service imports and net aircraft imports related to leasing (2007-19).

[42] Note that the conventional and modified series (such as GNI and GNI*) are at very similar levels in 1995, when the globalisation effects were still relatively insignificant. Hence, the conventional and modified series may combined in a straightforward manner.

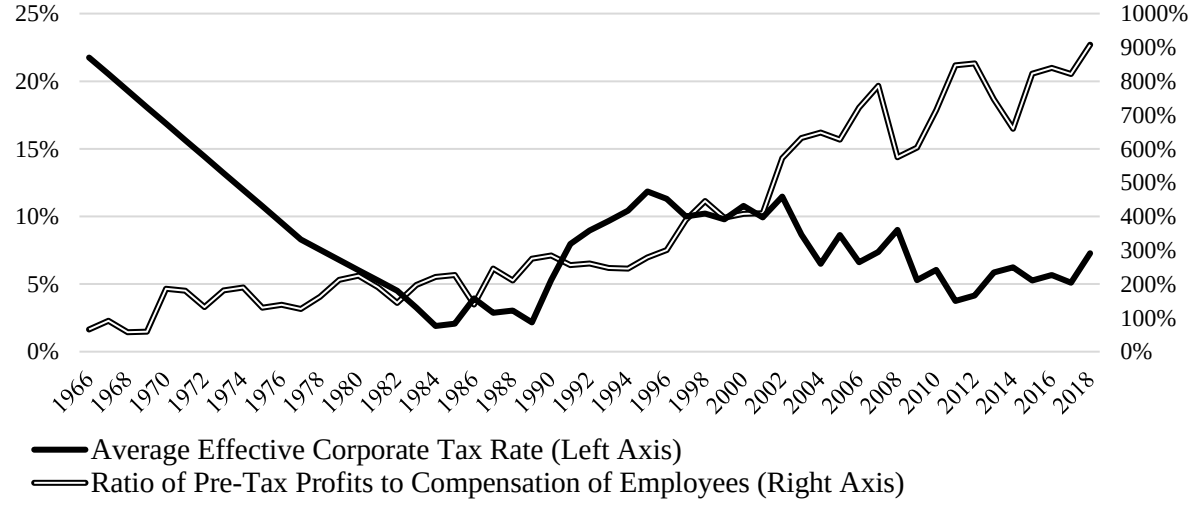
The last modification concerns unit labor costs, which is conventionally defined as the ratio of the compensation of employees to real output. In its denominator, the adjusted measure uses real GDP minus the income of re-domiciled companies and depreciation on aircraft leasing, R&D service imports, and trade in IP.

The modified measures employed go some way to reducing the degree of distortion in the Irish national accounts, but are by no means perfect. For example, subsidiaries in Ireland that facilitate profit shifting likely still distort the modified trade indicators. To this end, a measure of the profitability of foreign affiliates in Ireland would be useful as a control variable to separate out the effect of profit shifting as much as possible in export and import regressions. Similarly, a measure of the AECTR of foreign affiliates is necessary to control for the real effects of tax competition and see whether it has a significant effect on investment, as would be expected in a tax competition-led regime.

For the purpose of constructing these profitability and AECTR variables, the BEA survey data described in section two is key. On both measures, the definitions and data of Wright and Zucman (2018) are used, which spans from 1966 until 2016. The authors use data from the US Internal Revenue Service to provide estimates of the data missing in the BEA dataset in certain years prior to 1982. To expand the authors' dataset until 2018, the relevant data is added to the readymade Wright and Zucman (2018) dataset from the most recent releases of the BEA survey. The profitability measure employed is the ratio of pre-tax profits to total compensation of employees of all majority-owned affiliates of US MNCs in Ireland. The AECTR of foreign affiliates in Ireland is defined as the percentage of corporate income tax paid by US foreign affiliates to the Irish government out of their total pre-tax profits registered in Ireland. Pre-tax profits, it should be noted, are net of capital depreciation and net interest payments, since, as Wright and Zucman (2018) point out, depreciation and interest payments are typically tax deductible.

These indicators of the profitability of and taxes paid by foreign affiliates in Ireland are graphed in Figure 5.7 for the years between 1966 and 2018. As explained above, for the years

Figure 5.7 *Falling Corporate Tax Rates and Soaring Pre-Tax Profits of Foreign Affiliates in Ireland (1966-2018)*



Data sources: Wright & Zucman (2018), BEA (2020)

of 1967 until 1976 and 1978 until 1981, estimates are used by the authors. Profit shifting is strongly implied by the increase in the pre-tax profits to wage bill ratio from 66% in 1966 to 908% in 2018, a phenomenal rise characteristic of tax havens around the world (Wright & Zucman 2018; Tørsløv et al. 2018).

In summary, and before laying out the exact model to be estimated, it should be emphasized that the model will be applied to two different datasets, as indicated in Table 5.2. For the purposes of comparison and robustness, these two datasets are to be used in four econometric specifications. The first two are the benchmark specifications, which make use of the conventional data and do not include any special MNC-related control variables. The first is estimated using OLS and the second using 3SLS. The third and fourth specifications employ the modified data and include the AECTR and PWFA control variables described above. Again, they differ only by how they are estimated: The third is estimated by OLS and the fourth by 3SLS.

Table 5.2 *Summary of the three econometric specifications used in this paper*

Specification	Dataset	Extra MNC Variables?	Estimator
1 (Benchmark)	Conventional	No	OLS
2 (Benchmark)	Conventional	No	3SLS
3	Modified	Yes: AECTR and PWFA	OLS
4	Modified	Yes: AECTR and PWFA	3SLS
	See appendix for sources and definitions of all variables in the two datasets		

5.4.2 Model and its Empirical Specification

The model offered here is a "structural" post-Kaleckian model, where equations for the price level and each private component of demand are formulated and estimated separately, rather than an "aggregative" model, where GDP or capacity utilization is regressed directly on the wage or profit share (Blecker, 2016). The structural model is preferred here simply so that the effects on each component of demand can be estimated. A detailed comparative evaluation of the two empirical approaches to demand regime estimation can be found in Blecker (2016).

For the price level and each component of private demand, the baseline theoretical relationship is first outlined before its exact empirical specification is shown. A few general notes relevant for the empirical specifications employed are in order. Firstly, natural logarithms of most of the series are used to address the exponential growth that many exhibit. This has a number of benefits, chief among which is the reduction of the degree of heteroscedasticity in the error terms. Second, two unit root tests were conducted, namely the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) and augmented Dickey-Fuller (ADF) tests. Both test suggest most series are integrated of order one (I(1)). Johansen tests for cointegration did not suggest the presence of any cointegrating variables. Given these results, all of the empirical specifications are therefore in first differences, as indicated by the difference operator (Δ). Third, the lag length of dependent variables is determined by the Bayesian Information Criterion (BIC) over a range of three possible lags. Lags of independent variables are also added if they are found to be significant or otherwise relevant for the point estimate or standard errors of other variables. Note, however, than the lag length may differ depending on the dataset being used.

For concreteness, in this paper the Irish economy will be defined as wage-led if $\delta AD/\delta ULC > 0$ and profit-led if $\delta AD/\delta ULC < 0$, where *AD* refers to total private aggregate demand and *ULC* is nominal unit labor costs. Although much of the literature defines the demand regime in terms of changes in the wage/profit share rather than changes in *ULC*, the latter is preferred here. After all, theory suggests that exports and imports are not a function of the wage share but rather the determinants of the wage share that also affect international price competitiveness, such as *ULC*, the mark-up, and nominal exchange rates (Blecker 1989).[43] The approach taken here is more in line with Blecker et al. (2020), who define the demand regime with respect to changes in labor cost competitiveness, $z = E * P^f/ULC$, rather than the wage/profit share, where *E* is the nominal exchange rate and P^f represents the foreign price level.[44] In sum, the marginal effect of an increase in unit labor costs on private total demand in proportion to the average income level ($\bar{Y}$) is calculated using equation (5.2).

$$\frac{1}{\bar{Y}}\frac{\partial AD}{\partial ULC} = \left[\left(\frac{\partial C}{\partial \omega} + \frac{\partial I}{\partial \omega}\right)\frac{\partial \omega}{\partial ULC} + \left(\frac{\partial X}{\partial ULC} - \frac{\partial M}{\partial ULC}\right)\right]\frac{1}{\bar{Y}} \tag{5.2}$$

5.4.2.1 Consumption

The baseline consumption function is

$$C = C_A + [\omega(c_w - c_\pi) + c_\pi]Y \tag{5.3}$$

where C_A is real autonomous consumption and the overall marginal propensity to consume is an average of the marginal propensity to consume out of wages, c_w, and out of profits, c_π, weighted by the wage share, ω. Differentiating with respect to the wage share gives

$$\frac{\partial C}{\partial \omega} = (c_w - c_\pi)Y\,. \tag{5.4}$$

Hence, so long as the propensity to consume out of wages exceeds that out of profits, the effect of an increase in the wage share on consumption is positive. Since, as implied by equation (5.2), all effects on the components of demand are to be expressed as a proportion of the sample mean, $\bar{Y}$, one notes that the desired estimate is

$$\frac{1}{\bar{Y}} * \frac{\partial C}{\partial \omega}\Big|_{\bar{Y}} = c_w - c_\pi, \tag{5.5}$$

which is equivalent to the derivative of the average propensity to consume (*C/Y*) with respect to the wage share:

$$\frac{\partial (C/Y)}{\partial \omega} = \frac{\partial}{\partial \omega}\left[\frac{C_A}{Y} + \omega(c_w - c_\pi) + c_\pi\right] = c_w - c_\pi. \tag{5.6}$$

[43] In order to view the demand regime in terms of the wage/profit share, a common practice in the literature is to define $\Delta NX/\Delta\omega$ as the change in net exports caused by a change in unit labor costs, where the change in unit labor costs also causes a one percentage point change in the wage share. In essence, this approach is equivalent to dividing equation (2) by $\partial\omega/\partial ULC$. ULC drive net exports and total private demand in such an approach as well, albeit implicitly. As such, here it is deemed simply clearer to define the demand regime *explicitly* in terms of ULC since the direction of causation is immediately understood, as are the underlying drivers of functional income distribution, trade and total aggregate demand (ULC and expressly not, for example, mark-ups).

[44] This *z* ratio was used in preliminary versions of this paper, but ultimately decided against due to the sensitivity of the variable and the results to the definition of the numerator ($E * P^f$).

Hence, in this paper, the marginal effect of an increase in the wage share evaluated at the average income level will be estimated by regressing the average propensity to consume (APC) on the wage share. This differs to the approach most often taken in related literature, where consumption is modelled as a function of the wage bill and the profit level, and the coefficients on these variables are then used to find the desired difference in propensities to consume ($c_w - c_\pi$).[45] While the point estimates of the two approaches should be equivalent—and in preliminary regressions were indeed equivalent—the approach offered here is deemed preferable for two reasons. First, it offers a way of directly estimating the standard error and thus statistical significance of $\widehat{c_w - c_\pi}$. Compared to the usual approach that requires tests of joint significance on the coefficients of the wage bill and profit level in the consumption regression, being able to simply check the t-statistic of the wage share coefficient is deemed more convenient. Second, this approach proved easier to handle when addressing the endogeneity issues in the three-stage-least-squares approach, as there is only one endogenous variable of interest to instrument, rather than two.

$$\Delta \ln (C/Y)_t = c_0 + c_1 \Delta \ln Y_t + c_2 \Delta \ln \omega_t + c_3 \Delta \ln SB_t + c_4 d08 + \epsilon_t \qquad (5.7)$$

As equation (5.7) shows, the empirical specification of the APC function includes a measure of social benefits (*SB*) and, in some specifications, a dummy variable (d08) representing the great recession period of 2008 until 2012 as control variables. Tax and debt variables were also considered as additional controls, but were found to be insignificant and irrelevant for the estimates of other coefficients in preliminary estimates or simply unavailable for a long enough period to allow for a meaningful inclusion. As long as $c_w > c_\pi$, the coefficient on the wage share (c_2) is expected to be positive, as is the coefficient on the social benefits variable (c_3). Lastly, since the APC is expected to fall with higher levels of national income, c_1 is likely to be negative.

5.4.2.2 Investment

Following the standard post-Kaleckian investment function, real investment is modelled as a function of autonomous investment (I_A) capacity utilization, and the wage share (Bhaduri & Marglin 1990). However, as usual a proxy for capacity utilization is used, namely real GDP or modified GNI, as is shown in equation (5.8).

$$I = I_A + i_Y Y + i_\omega \omega \qquad (5.8)$$

A rising wage share implies a decreasing means of internal finance (i.e. retained earnings), external finance (to the extent retained earnings are used as collateral for a loan), as well as a larger risk of illiquidity or insolvency in the event of the failure of outstanding investment projects (Kalecki 1937a). As such, the effect of an increase in the wage share on business investment, i_ω, is thought to be negative.

From the econometric perspective, included in the investment function as controls are the long-run real interest rate (IR_t) and, in specifications 3 and 4, the average effective corporate tax rate on foreign affiliates based in Ireland ($AECTR_t$). This is shown in equation (5.9). The

[45] The approach taken here is not without precedent, however. For example, Bowles and Boyer (1995) employ a similar setup, though with the average propensity to save rather than the average propensity to consume.

coefficients on both variables are expected to be negative, as is, for the reasons given above, the coefficient on the wage share. On the other hand, a higher level of demand, proxied by *Y*, should positively affect investment. All variables are in expressed in natural logarithms except the interest rate and AECTR.

$$\Delta \ln I_t = i_0 + i_1 \Delta \ln Y_t + i_2 \Delta \ln \omega_t + i_3 \Delta IR_t + i_4 \Delta AECTR_t + \epsilon_t \tag{5.9}$$

5.4.2.3 Prices

Following standard Kaleckian mark-up pricing theory, the domestic price level is thought of as being determined by a mark-up (m) on nominal unit labor costs (ULC) and unit material costs (UMC), as in equation (5.10).

$$p = (1 + m)(ULC + UMC) \tag{5.10}$$

Note that $\delta\omega/\delta ULC$ is needed, by equation (2), for estimation of the overall demand regime. Given how the wage share is defined, it follows that $\ln \omega = \ln ULC - \ln p$, and so

$$\frac{\delta \ln \omega}{\delta \ln ULC} = 1 - \frac{\delta \ln P}{\delta \ln ULC}. \tag{5.11}$$

Econometrically, the price level regression is specified as in equation (5.12). The domestic price level (*P*), reflected in the CPI, is modelled as a function of unit labor costs, the price of oil (*OIL*), the nominal exchange rate (*E*), and foreign price level (P^f). Unfortunately, data on or proxies of the average mark-up imposed by firms in Ireland are hard to come by. The average mark-up estimated by De Loecker and Eeckhout (2018) is used in a preliminary regression, but found to be insignificant and with negligible impact on the estimation of the effect of the variable of interest, unit labor costs. Since the estimated mark-up series goes from only 1980-2016, it is ultimately omitted so as to not limit the number of observations unnecessarily. The domestic output level is used as another control variable. This can be justified by appeal to more mainstream demand-pull theories of inflation or via the more post-Keynesian conflict theory of inflation, where a higher output level corresponds to a higher employment rate, which bolsters labor power in the negotiation of wages. Lastly, in order to try to capture the effects of globalisation on domestic inflation, the total number of regional trade agreements (RTA) around the world is also included. Globalisation tends to lead to lower prices through cheaper imports from abroad and the increased threat of relocating production abroad, which may serve to dampen domestic wage demands (see, for example, Milberg & Winkler 2010).

$$\begin{aligned}\Delta \ln P_t = p_0 + p_1 \Delta \ln ULC_t + p_2 \Delta \ln OIL_t + p_3 \Delta \ln E_t + p_4 \Delta \ln P_t^f + p_5 \Delta \ln Y_t \\ + p_6 \Delta \mathrm{RTA}_t + \epsilon_t\end{aligned} \tag{5.12}$$

5.4.2.4 Trade

Real exports, *X*, are taken to be positively dependent on both foreign income (Y^f) and the real exchange rate, where the latter is the ratio of the foreign price level expressed in the domestic currency by the nominal exchange rate to the domestic price level, $e^R = EP^f/P$ (Blecker 1989,

Bhaduri & Marglin 1990). In turn, the domestic price level is determined by a mark-up on unit costs, as in equation (5.10). Therefore, the baseline export function to be modelled is given by equation (5.13). Real exports that are independent of foreign income and price competitiveness are reflected in X_A. For the reasons given above, the coefficients on the real exchange rate (x_e) and foreign income (x_Y) are expected to be positive.

$$X = X_A + x_e\left(\frac{ep^f}{(1+m)(ULC+UMC)}\right) + x_Y Y^f \tag{5.13}$$

Likewise, real imports, *M*, are also dependent on the degree of price competitiveness of domestic firms relative to foreign firms, reflected in the real exchange rate, as well the level of domestic income. Real autonomous imports are denoted M_A and the coefficients on the real exchange rate (m_e) and domestic income (m_Y) are expected to be negative and positive respectively.

$$M = M_A + m_e\left(\frac{ep^f}{(1+m)(ULC+UMC)}\right) + m_Y Y \tag{5.14}$$

The econometric specification used for equations (5.13) and (5.14) are offered in equations (5.15) and (5.16) respectively. For the purposes here, foreign income is defined as the combined GDP of the UK, US, and the 12 countries of the Euro Area bar Ireland. As in the pricing equation, unit labor costs, nominal exchange rate, and the foreign price level feature in both trade specifications, and the estimated mark-up data of De Loecker and Eeckhout (2018), while used in preliminary regressions, was ultimately omitted for the reasons given above. In specifications 3 and 4, the profit to wage ratio of foreign affiliates (PWFA) is included to control for the effects of profit shifting. The dummy variable for the great recession was often found to have a significant effect on exports, and so is included.

$$\begin{aligned}\Delta \ln X_t = {} & x_0 + x_1 \Delta \ln Y_t^f + x_2 \Delta \ln ULC_t + x_3 \Delta \ln E_t + x_4 \Delta \ln P_t^f + x_5 \Delta \ln PWFA_t \\ & + x_6 d08 + \epsilon_t\end{aligned} \tag{5.15}$$

$$\begin{aligned}\Delta \ln M_t = {} & m_0 + m_1 \Delta \ln Y_t + m_2 \Delta \ln ULC_t + m_3 \Delta \ln E_t + m_4 \Delta \ln P_t^f + m_5 \Delta \ln PWFA_t \\ & + \epsilon_t\end{aligned} \tag{5.16}$$

5.4.2.5 Marginal effects

Since the regressions are run in logarithms, the necessary marginal effects needed in equation (5.2) to estimate the sign of $\partial AD/\partial ULC$ can be backed out by multiplying and dividing by the required sample averages, as denoted by bars in equation (5.2').

$$\begin{aligned}\frac{1}{\bar{Y}}\frac{\partial AD}{\partial ULC} = {} & \left[\frac{\partial \ln(C/Y)}{\partial \ln \omega}\frac{\overline{(C/Y)}}{\bar{\omega}} + \frac{\partial \ln I}{\partial \ln \omega}\frac{\bar{I}}{\bar{\omega}\bar{Y}}\right]\frac{\bar{\omega}}{\overline{ULC}}\left(1 - \frac{\partial \ln P}{\partial \ln ULC}\right) \\ & + \left[\frac{\partial \ln X}{\partial \ln ULC}\frac{\bar{X}}{\overline{ULC}} - \frac{\partial \ln M}{\partial \ln ULC}\frac{\bar{M}}{\overline{ULC}}\right]\frac{1}{\bar{Y}}\end{aligned} \tag{5.2'}$$

These sample averages are displayed in Table 5.3 for the conventional and modified data.

Table 5.3 *Sample averages used in deriving marginal effects*

Dataset	$\overline{(C/Y)}$	$\bar{\omega}$	$\bar{I}$	$\bar{Y}$	$\overline{ULC}$	$\bar{X}$	$\bar{M}$
Conventional	0.510	0.557	24.9	106.7	0.763	87.0	75.0
Modified	0.617	0.598	18.4	87.6	0.667	79.1	67.5

5.4.3 Estimation Method

Two estimation techniques are used in this paper: Ordinary least squares (OLS) and three stage least squares (3SLS). OLS has the advantage of being easy to implement and interpret. Although OLS estimation is rendered inefficient by the presence of heteroscedasticity and autocorrelation (HAC), it is relatively straightforward to implement HAC-robust standard errors to deal with the threats to usual statistical inference. All OLS estimated coefficients given in this paper are thus HAC-robust.

The main problem of using OLS to estimate demand regimes is the inherent threat of simultaneity bias. This is most obvious in the case where GDP, GNI, or GNI* is used as an independent variable in consumption, investment or import regressions, though one can reasonably make the case for the endogeneity of the wage share as well as other variables (Blecker 2016, Barrales & von Arnim 2017, Blecker et al. 2020). Some authors have tried to eschew this endogeneity issue, by using lags of the simultaneously determined independent variable instead of contemporaneous values (e.g. Stockhammer & Stehrer 2011). However, Reed (2015) shows that this practice does not allow one to avoid the threat of simultaneity bias. Other authors acknowledge and discuss the issue but proceed with OLS regardless, citing the lack of preferable alternatives such as valid instruments for an instrumental variables approach (e.g. Onaran & Obst 2016).

As pointed out by Reed (2015), lags of endogenous variables may serve as valid instruments, but only as long as those lags fulfil the usual relevance and exogeneity criteria. Though it is relatively easy to show that lagged instruments are relevant and not over-identified, the possibility that a given lag truly belong in the equation of interest is difficult to rule out. Therefore, as in Blecker et al. (2020), lags of the endogenous variables serve as instruments in the 3SLS approach essentially on the assumption that the exogeneity criterion for a valid instrument is fulfilled. Though one cannot say definitively whether estimates given by 3SLS are an improvement upon those given by OLS, it is nonetheless maintained that, at the very least, they are a worthwhile robustness check.

While the simpler two stage least squares (2SLS) would suffice to deal with the endogeneity problem, 3SLS is preferred as it a systems, rather than single-equation, approach that allows for the correlation of cross-equation errors. Since unobserved factors that affect one component of demand likely affect another, accounting for the correlation of cross-equation errors means 3SLS likely estimates coefficients more efficiently than 2SLS.[46] A Hausman test supports suspicions that 3SLS outperforms 2SLS, and is hence is preferred here.

[46] Indeed, Zellner and Theil (1962), the originators of the 3SLS method, use the approach to estimate a similar simultaneous system of consumption, investment, and output in their seminal paper (see pp. 71-77).

Since the lag length of endogenous variables differs between equations, different sets of instruments are used for the different equations.[47] Without adjusting the conventional 3SLS estimator based on Zellner and Theil (1962), Schmidt (1990) shows that the use of different instruments for different equations may lead to inconsistent results. Therefore, the generalized method of moments variant of the 3SLS estimator suggested by Schmidt (1990), denoted "3SLS-GMM", is used. For the reasons summarized in Henningsen and Hamann (2007), the 3SLS-GMM approach is more robust than the original 3SLS approach in a number of ways.

While it is a straightforward matter to make the standard errors estimated by OLS robust to the presence of any heteroscedasticity and autocorrelation, doing so those given by the 3SLS-GMM estimator is not. Therefore, Breusch-Pagan and Breusch-Godfrey tests for heteroscedasticity and serial correlation are performed using differenced and logged data in each regression. Both tests fail to reject the null hypotheses of homoscedastic and non-serially correlated errors.

5.4.4 Results

For the regressions corresponding to the price level and each component of private demand, the results for each of the four specifications are shown in the columns of Tables 5.4 to 5.8. Table 5.4 begins with the results of the APC regressions. A one percent increase in the conventional adjusted wage share of GDP is shown to lead to an increase in the APC of 0.46% (when using OLS) and 0.63% (when using 3SLS), whereas a one percent increase in the *modified* wage share increases the APC by 0.59% (OLS) and 0.63% (3SLS). The coefficient on $\Delta \, ln \, \omega_t$ is significant at the 5% level in the first specification, and at the 1% level in the other three. The effects of the control variables that are significant at the 5% level or higher have the expected signs, though in the case of social benefits this is only true of the cumulative effect over two periods. While increases in income are expected to decrease the APC, it is not too surprising that this variable is not significant in most specifications since its coefficient is directly related to autonomous consumption by equation (5.6). Given the lack of data on consumption when income is close to zero, it is difficult to estimate autonomous consumption efficiently.

[47] Modified national income, wage share, and unit labor costs are all treated as endogenous in the 3SLS analysis, and are instrumented by the preceding four lags of these variables. The first lag of some these endogenous variables were deemed necessary in the desired, second stage regressions. For example, the first lag of the wage share was necessary for the investment function, but not the average propensity to consume. Hence, it could serve as an instrument in the latter but not in the former, and therefore the list of instruments needed to vary on an equation-by-equation basis.

Table 5.4 *Regression results - Dependent Variable:* $\Delta\, ln(C/Y)_t$

	Unadjusted data		**Data adjusted for distortions due to MNCs**	
	Spec. 1 (OLS)	Spec. 2 (3SLS-GMM)	Spec. 3 (OLS)	Spec. 4 (3SLS-GMM)
Constant	0.009	-0.001	-0.017	0.021
	(0.008)	(0.011)	(0.011)	(0.022)
$\Delta\, ln\, \omega_t$	0.464**	0.628***	0.589***	0.626***
	(0.180)	(0.153)	(0.138)	(0.217)
$\Delta\, ln\, SB_t$	-0.140	-0.131*	-0.156*	-0.161**
	(0.125)	(0.069)	(0.086)	(0.071)
$\Delta\, ln\, SB_{t-1}$	0.073	0.064	0.222***	0.234**
	(0.115)	(0.065)	(0.049)	(0.090)
$\Delta\, ln\, Y_t$	-0.288*	-0.044	0.133	0.222
	(0.152)	(0.194)	(0.153)	(0.432)
$\Delta d08$			0.037**	0.044
			(0.015)	(0.035)
$\Delta\, ln(C/Y)_{t-1}$			0.095	-0.095
			(0.138)	(0.129)
Adjusted R^2	0.554	0.510	0.512	0.510
Observations	48	48	48	48
DF	43	43	41	41

***p < 0.01, **p < 0.05, *p < 0.1. Standard errors in parentheses.

As Table 5.5 shows, the wage share is found to have a statistically significant negative effect on total investment after one lag. Specifications 3 and 4 suggest the unadjusted data largely overestimates how strongly negative this effect is. Total investment falls by 1.19% (3SLS) - 1.25% (OLS) given a rise in the wage share of GDP by 1%, but by around only 0.79% given an equal rise in the *modified* wage share. The control variables have the expected sign, most interesting among which is that of the AECTR. A one percent fall in the AECTR is found to lead to an approximate rise in total investment of 1.5% after one period, supporting the hypothesis that the beggar-thy-neighbour policy of tax competition has had tangible effects on the Irish economy distinct from the mere conduit of paper profits. The effect of the AECTR is significant in both the third specification (at the 1% level) and the fourth specification (at the 5% level).

Table 5.5 *Regression results - Dependent Variable: $\Delta \ln I_t$*

	Unadjusted data, no added controls		**Adjusted data, controlling for foreign affiliate effective corporate tax rate**	
	Spec. 1 (OLS)	Spec. 2 (3SLS-GMM)	Spec. 3 (OLS)	Spec. 4 (3SLS-GMM)
Constant	-0.011	-0.057	-0.016	-0.030
	(0.025)	(0.048)	(0.011)	(0.044)
$\Delta \ln \omega_t$	0.012	0.531	-0.083	0.083
	(0.473)	(0.604)	(0.508)	(0.586)
$\Delta \ln \omega_{t-1}$	-1.253***	-1.185***	-0.804***	-0.783**
	(0.311)	(0.299)	(0.219)	(0.366)
ΔIR_t	-0.006	-0.003	-0.008***	-0.008*
	(0.005)	(0.005)	(0.003)	(0.004)
ΔIR_{t-1}	-0.010*	-0.008**	-0.006	-0.006
	(0.005)	(0.004)	(0.004)	(0.004)
$\Delta \ln Y_t$	1.265**	2.231**	1.349***	1.681*
	(0.549)	(1.068)	(0.289)	(0.988)
$\Delta d08$	-0.007	0.047	-0.050	-0.026
	(0.050)	(0.071)	(0.053)	(0.077)
$\Delta AECTR_t$			-0.434	-0.517
			(0.602)	(0.785)
$\Delta AECTR_{t-1}$			-1.531***	-1.504**
			(0.512)	(0.709)
Adjusted R^2	0.335	0.320	0.621	0.614
Observations	58	56	52	52
DF	51	49	43	43

***p < 0.01, **p < 0.05, *p < 0.1. Standard errors in parentheses.

Moving now to the sources of external demand, the estimated effects of unit labor costs on real exports are detailed in Table 5.6, alongside those of the control variables. Interestingly, while unit labor costs have a significant negative effect in the first and second unadjusted specifications, no significant effect could be detected in the specifications using the adjusted data and the extra control. One possible explanation for this is that the first and second specifications are subject to omitted variable bias.[48] Profit shifting inflates the profitability of foreign affiliates (PWFA), total exports, and GDP. Failing to include a measure like *PWFA* means the increase in exports caused by profit shifting may be falsely attributed to a fall in unit labor costs, since GDP, which is also inflated by profit shifting, enters into the denominator of *ULC*. As with investment, the additional MNC-related control increases the goodness of fit quite substantially.

[48] To rule out an alternative explanation suggested by an anonymous referee that the results may be influenced by collinearity between ULC* and PWFA, an additional robustness check was run, where PWFA in the export and import regressions was replaced by the share of worldwide profits of US MNEs booked in Ireland. The results are very similar. In particular, unit labor costs were still found to be insignificant in driving Irish exports and imports in specifications three and four at even the 10 percent level.

Table 5.6 *Regression results - Dependent Variable:* $\Delta \ln X_t$

	Unadjusted data, no added controls		**Adjusted data, controlling for the effects of profit shifting**	
	Spec. 1 (OLS)	Spec. 2 (3SLS-GMM)	Spec. 3 (OLS)	Spec. 4 (3SLS-GMM)
Constant	0.084***	0.084***	0.096***	0.095***
	(0.013)	(0.015)	(0.010)	(0.017)
$\Delta \ln ULC_t$	-0.507**	-0.473***	-0.266	-0.253
	(0.203)	(0.147)	(0.178)	(0.174)
$\Delta \ln ULC_{t-1}$	0.108	0.136	-0.074	-0.074
	(0.120)	(0.146)	(0.213)	(0.167)
$\Delta \ln Y_t^f$	0.331**	0.375**	-0.335*	-0.297
	(0.163)	(0.170)	(0.182)	(0.209)
$\Delta \ln Y_{t-1}^f$			0.514***	0.476***
			(0.168)	(0.162)
$\Delta \ln P^f{}_t$	-0.076	-0.110	-0.101	-0.116
	(0.119)	(0.121)	(0.101)	(0.146)
$\Delta \ln E_t$	-0.178	-0.159	-1.270***	-1.248***
	(0.246)	(0.281)	(0.340)	(0.346)
$\Delta\, d08$	-0.084***	-0.078***	0.077***	-0.076***
	(0.012)	(0.023)	(0.026)	(0.025)
$\Delta \ln X_{t-1}$	0.114	0.170	0.110	0.112
	(0.122)	(0.121)	(0.190)	(0.142)
$\Delta \ln PWFA_t$			0.137**	0.135***
			(0.054)	(0.027)
Adjusted R^2	0.428	0.466	0.512	0.511
Observations	58	54	52	52
DF	50	46	42	42

***p < 0.01, **p < 0.05, *p < 0.1. Standard errors in parentheses.

In Table 5.7, unit labor costs are found to be insignificant in explaining imports across all specifications.[49] Imports appear most driven by domestic income, the nominal exchange rate, and foreign price level. Again, the profitability of foreign affiliates is found to be a significant factor in the explanation of the value of total Irish imports. This, alongside the fact that the coefficient on *PWFA* in the import function is smaller than that of the same variable in the export function, fits with the hypothesis that profit shifting distorts the Irish trade balance.

[49] Further analysis not reported in full here show that replacing *ULC* with the price level does not qualitatively change the result that price competitiveness appears as an insignificant predictor in the third and fourth specifications of the export and import regressions.

Table 5.7 *Regression results - Dependent Variable:* $\Delta \ln M_t$

	Unadjusted data, no added controls		**Adjusted data, controlling for the effects of profit shifting**	
	Spec. 1 (OLS)	Spec. 2 (3SLS-GMM)	Spec. 3 (OLS)	Spec. 4 (3SLS-GMM)
Constant	0.029**	0.052*	0.037***	0.053**
	(0.013)	(0.027)	(0.011)	(0.021)
$\Delta \ln ULC_t$	0.223	-0.387	0.190	-0.124
	(0.274)	(0.876)	(0.137)	(0.381)
$\Delta \ln ULC_{t-1}$	-0.272	-0.065	-0.182	-0.029
	(0.183)	(0.454)	(0.143)	(0.252)
$\Delta \ln Y_t$	0.882***	-0.161	0.939***	-0.084
	(0.230)	(1.311)	(0.184)	(0.978)
$\Delta \ln Y_{t-1}$	0.432*	1.041	0.518**	0.862*
	(0.267)	(1.001)	(0.214)	(0.481)
$\Delta \ln E_t$	-1.031***	-0.877**	-1.570***	-1.451***
	(0.357)	(0.421)	(0.244)	(0.363)
$\Delta \ln P^f{}_t$	-0.517***	-0.239	-0.540***	-0.436**
	(0.145)	(0.417)	(0.101)	(0.213)
$\Delta \ln M_{t-1}$			-0.047	0.124
			(0.125)	(0.214)
$\Delta \ln PWFA_t$			0.083**	0.078**
			(0.038)	(0.037)
Adjusted R^2	0.504	0.374	0.636	0.461
Observations	55	54	52	52
DF	51	47	43	43

***p < 0.01, **p < 0.05, *p < 0.1. Standard errors in parentheses.

The results of the regression of changes in logged CPI on its various explanatory variables is given in Table 5.8. As expected, higher unit labor costs appear to lead to higher prices. A one percent increase in unit labor costs is associated with an increase in the price index of between 0.16% and 0.22%, depending on the specification. All other variables have the expected sign, though the income level is not found to be a significant predictor of inflation. Generally, the goodness-of-fit is high across all specifications.

Table 5.8 *Regression results - Dependent Variable: $\Delta \ln P_t$*

	Unadjusted data		**Data adjusted for distortions due to MNCs**	
	Spec. 1 (OLS)	Spec. 2 (3SLS-GMM)	Spec. 3 (OLS)	Spec. 4 (3SLS-GMM)
Constant	0.012	0.012	0.010	0.016
	(0.008)	(0.008)	(0.008)	(0.010)
$\Delta \ln ULC_t$	0.216***	0.190**	0.194***	0.162**
	(0.064)	(0.074)	(0.069)	(0.072)
$\Delta \ln ULC_{t-1}$	0.002	0.015	0.026	0.039
	(0.005)	(0.060)	(0.055)	(0.059)
$\Delta \ln OIL_t$	0.033***	0.035***	0.033***	0.036***
	(0.010)	(0.010)	(0.011)	(0.011)
$\Delta \ln Y_t$	0.082	0.083	0.124	0.046
	(0.085)	(0.075)	(0.077)	(0.111)
$\Delta \ln E_t$	-0.263***	-0.234**	-0.260***	-0.239**
	(0.083)	(0.100)	(0.084)	(0.096)
$\Delta \ln P^f{}_t$	0.121**	0.118**	0.117**	0.135**
	(0.048)	(0.052)	(0.050)	(0.052)
ΔRTA_t	-0.001*	-0.001*	-0.001**	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
$\Delta \ln P_{t-1}$	0.529***	0.542***	0.545***	0.516***
	(0.076)	(0.090)	(0.082)	(0.089)
Adjusted R^2	0.891	0.893	0.892	0.892
Observations	55	51	55	51
DF	46	42	46	42

***p < 0.01, **p < 0.05, *p < 0.1. Standard errors in parentheses.

5.4.5 Marginal effects and the total private demand regime

Given the regression results of the preceding section, the total private demand regime of Ireland can now be estimated according to equation (5.2'). The derived marginal effects are displayed in Table 5.9 for the three empirical specifications used in this paper. Only effects that are significant at the 1% or 5% level are reported in Table 5.9. Dashes signify that the effect was not significant at even the 10% level.

It is clear that adjusting and controlling for the influence of MNCs has a substantial effect on the estimation of Ireland's demand regime. In specifications 1 and 2, with no adjustments and no additional control variables, Ireland is found to be quite strongly profit-led. Indeed, in specification 1, private domestic demand (*C+I*) alone already appears to be slightly profit-led before the negative effect of higher unit labor costs on trade are considered, though specification 2, which uses the same unadjusted data, gives rise to the result that domestic demand is wage-led. The estimated effect of unit labor costs on the conventional wage share is lower than that on the modified wage share.

In the specifications that adjust and control for the influence of MNCs (namely 3 and 4), the marginal effect of an increase in the wage share on consumption is considerably higher, especially compared to the first specification. The size of the effect on investment is also much lower when using the adjusted data and OLS or 3SLS estimators. Taken together, these differences in the marginal effects on the components of demand explain the stark difference in the estimated demand regime given by the MNC-robust specifications (3 and 4) and the benchmark specifications (1 and 2). These results indicate the underlying Irish economy is wage-led rather than profit-led.

Table 5.9 *Marginal effects and the estimated demand regime of Ireland across specifications*

Specification	**Marginal effects** (as a proportion of sample mean national income, $\bar{Y}$)						**Result**
	$\frac{\partial \omega}{\partial ULC}$	$\frac{\partial C}{\partial \omega}$	$\frac{\partial I}{\partial \omega}$	$\frac{\partial X}{\partial ULC}$	$\frac{\partial M}{\partial ULC}$	$\frac{\partial AD}{\partial ULC}$	
1: OLS; Not MNC-robust	0.57	0.43	-0.53	-0.54	-	-0.60	Profit-led
2: 3SLS; Not MNC-robust	0.59	0.58	-0.50	-0.51	-	-0.46	Profit-led
3: OLS; MNC-robust	0.72	0.61	-0.28	-	-	0.24	Wage-led
4: 3SLS; MNC-robust	0.75	0.65	-0.28	-	-	0.28	Wage-led

Incidentally, as the effects of unit labor costs are not statistically significant in the preferred (MNC-robust) specifications, the size of the effect of the *wage share* on total demand can be readily observed and compared with the literature. $\partial AD/\partial \omega$ is estimated to be 0.33 in specification 3 and 0.37 in specification 4 (assuming that changes in the wage share are caused either by changes in ULC or by changes in other determinants of the wage share that do not effect exports and imports). In comparison to the other literature that estimates $\partial AD/\partial \omega$ (see Table 5.1), this is the most wage-led (i.e. most positive) effect found yet. Closest to these estimates is that of Obst et al. (2020), who find that $\partial AD/\partial \omega = 0.22$ in Ireland, using a different modelling and empirical approach to that outlined here.

5.5 Implications

The finding that higher unit labor costs have no statistically significant effect on exports and imports is clearly a large part of the ultimate result that Ireland is wage-led. A likely explanation for the lack of price relevance in Irish trade comes down to the fact that a substantial part of Irish trade is due to MNCs, who locate in Ireland not for low labor costs, but for low taxes. To achieve the lowest tax rates, MNCs in Ireland often have to prove that a certain amount of expenditure on labor or capital took place in Ireland. For example, to be eligible for research and development tax credits and to benefit from the special low rate of 6.25% on income arising

from intellectual property (IP), MNCs must prove to the Irish authorities that "relevant activities" were performed on the IP in Ireland. Qualifying expenditure includes "wages, related overheads, plant and machinery, and buildings" (IDA 2016, p. 6). Hence, MNCs often choose to locate managerial positions and/or capital-intensive production processes that require highly skilled labor in Ireland. The inherent costs would likely be similar no matter where such aspects of business activity are located but the tax bill in Ireland is lower. It seems to be for this reason that virtually all of the world's largest pharmaceutical and technology companies, which are typically capital-intensive and require high-skill labor, have a real presence in Ireland.[50] Under these circumstances, it is not surprising that higher real wages do not seem to deter investment and exports too severely. If anything, the MNCs that locate in Ireland to avail of low taxes likely bid up wages in certain industries (Regan & Brazys 2018). Hence, by successfully engaging in tax competition, it may be that labor costs in Ireland are less subject to competitive downward pressure as a result.

However, this is not to say other countries should aim to emulate the Irish strategy. While it may be true that a 1% fall in the AECTR increased investment by around 1.5% in Ireland over the years analyzed, such results have little to no external validity—i.e. an effect, especially of this size, is unlikely to be enjoyed by another country looking to employ the same tax competitive economic model. There are at least three reasons for this, which are developed in more detail in Woodgate (2020). Firstly, multiple countries lowering corporate tax rates *simultaneously* does little to establish any one country as relatively low-tax. Second, it is hard to see how countries like Ireland could be undercut on corporate tax when its AECTR is already close to zero and has been since the 1980s (see Figure 5.7 above). Lastly, the cost of lower corporate taxes is higher post-tax inequality, which in and of itself slows demand growth in all wage-led economies. Thus, in a kind of analogue to the concerns of racing to the bottom on unit labor costs examined by Kiefer and Rada (2015), joining the race to the bottom in corporate tax rates may also only serve to stymie worldwide demand growth in the long-run and lead to less economic activity in tax havens and non-havens alike. In sum, then, Ireland is likely not the example of, but rather the exception to, the general rules of prudent macroeconomic tax policy.

There is also no guarantee for how long Ireland will benefit from this tax competitive strategy. Since tax competition is a beggar-thy-neighbor strategy that benefits a handful of nations at the expense of all others, the majority of countries around the world have every incentive to crack down on tax competition. To do so, nations acting unilaterally or multilaterally have a number of reasonable and implementable policy proposals at their deposal (for example, see Saez and Zucman 2020, ch. 6). Should meaningful anti-tax-competition legislation come to pass[51] or if Ireland somehow finds itself outcompeted in the race to the bottom in corporate taxes, the Irish economy in its current form would face an existential threat. Such a conclusion is also shared by Patrick Honohan, the former governor of the Central Bank of Ireland. Honohan recently warned that the high reliance on foreign MNCs, especially for tax

[50] See IDA (n.d.) for an extensive list that includes information and communication technology companies such as Amazon, Apple, Facebook, Google, and Microsoft, and pharmaceutical companies such as Pfizer, Roche, Novartis, and GlaxoSmithKlein, as well as many more of the largest MNEs.

[51] At the time of writing (July 2021), this appears to be a real possibility, with the G20 and more than 100 other countries set to agree on a global minimum corporate tax rate and some kind of tax apportionment mechanism. While details are vague and a lot remains to be seen, in principle such a reform could threaten Ireland's growth strategy whether or not Ireland agrees to commit to tax reforms (see Saez & Zucman 2020, ch. 6).

revenue, “is not really a sustainable system … It has generated huge tax revenues in the last few years [but] it might be like the end of one of these stars that has a supernova explosion towards the end of its life” (Hutton 2019). Furthermore, the outcome of the OECD BEPS project, as incomplete as it may be, already appears to threaten the Irish regime, with the Irish Minister for Finance warning that up to 20% of corporate tax revenues could be lost as a result of MNCs changing their tax plans to be compliant with new BEPS rules (Burke-Kennedy 2020). The sustainability of Irish growth is thus likely to be based on fostering domestic demand through, for example, redressing income inequality, rather than the mere hope that the Irish economy can remain tax competition-led indefinitely.

5.6 Conclusion

This paper has argued that one cannot fully understand the Irish economy without understanding key trends in modern globalisation such as tax competition, profit shifting, and contract manufacturing. Long-running and consistent tax-competitive policies have attracted numerous, large MNCs to Ireland, leading to higher investment and higher tax revenues. Many MNCs are resident in Ireland but sell all across Europe and further afield, meaning that employment in Ireland has become increasingly a function of world demand rather than domestic demand. In this sense, the Irish tax competitive regime is similar to the model of export-led growth via wage restraint. It is also similar in that it is a beggar-thy-neighbor strategy with repercussions for income inequality. Unlike export-led growth via wage restraint, however, the success of Ireland’s tax competitive strategy does not depend on the suppression of wage growth.

The econometric analysis conducted supports this conclusion. Using both OLS and 3SLS estimators, the effect of the modified wage share on domestic demand was found to be positive while no significance could be attributed to effect of higher unit labor costs on net exports once the effects of MNCs are taken into account. Failing to consider these effects paints a very different picture of the Irish economy. It would appear that real effects of Ireland’s tax competition-led regime go hand-in-hand with large distortionary effects that bias the conventional wage share and unit labor costs metrics downward, leading to a strong semblance of profit-led demand growth. However, in light of empirical results of this paper, further evidence of profit-led growth beyond the mere appearance could not be found. Across both specifications robust to the effects of MNCs, Ireland was found to be wage-led.

The limitations of the empirical approach taken relate to the data and estimators used. For example, improved and longer-running data on mark-ups and private debt could prove useful if made available in the future. For the reasons described above, the OLS estimator very likely suffers from endogeneity bias, while the 3SLS estimator alternative may still be imperfect. Future research on demand regime estimation, especially, but not exclusively, of other economies dominated by MNCs, may also benefit from the kinds of adjustments and controls seen here. Regarding Ireland specifically, further research on the question of the sustainability of Ireland’s peculiar macroeconomic regime could be valuable.

Appendix to Chapter 5

Data definitions and sources

All data are 1960-2019, unless noted otherwise.

Conventional (unadjusted) data

Variable	Definition	Source
GDP (Y)	Real gross domestic product (constant 2015 prices)	AMECO (2020)
Consumption (C)	Real private final consumption expenditure (constant 2015 prices)	AMECO (2020)
Investment (I)	Real gross fixed capital formation (GFCF) (constant 2015 prices)	AMECO (2020)
Exports (X)	Real exports of goods and services (constant 2015 prices)	AMECO (2020)
Imports (M)	Real imports of goods and services (constant 2015 prices)	AMECO (2020)
Price level (P)	National consumer price index	AMECO (2020)
Wage share (ω)	Adjusted wage share of GDP at current market prices	AMECO (2020)
ULC	Nominal unit labour costs	AMECO (2020)
Interest rate (IR)	Long term real interest rate, deflator GDP	AMECO (2020)
Foreign GDP (Y^f)	Sum of real GDP of EU12 bar Ireland, United States and United Kingdom	AMECO (2020)
Foreign Price Level (P^f)	Price deflator of imports of goods and services into Ireland	AMECO (2020)
Exchange rate (E)	Nominal effective exchange rate, relative to the rest of the former EU15, double export weights	AMECO (2020)
RTA	Cumulative number of regional trade agreements in force	WTO (2020)
Oil	Nominal price converted into euro per barrel of Arabian Light crude (1960-1984) and Brent crude (after 1985).	Bank of England (2020)
Social Benefits (SB)	Sum of all current transfer payments from government to households (1970-2019), deflated by GDP deflator	CSO (2020)
d08	Dummy variable, equal to one between 2008 and 2012	
Mark-up (m)	Estimated average mark-up of firms in Ireland (1980-2016)	De Loecker & Eeckhout (2018)

Modified data (adjusted for distortions due to MNCs)

GNI* (Y*)	Real modified gross national income (1995-2019) = GNI minus income of redomiciled companies minus depreciation on R&D service imports, IP, and aircraft leasing	CSO (2020)
C*	Quarterly modified consumption expenditure converted to annual basis (1995-2019) and expressed in real terms using consumption deflator	Own estimate based on data from CSO (2020) AMECO (2020)
I*	Quarterly modified gross fixed capital formation converted to annual basis (1995-2019) and expressed in real terms using GFCF deflator I*= GFCF – R&D and IP imports – net aircraft related to leasing	Own estimate based on data from CSO (2020) AMECO (2020)

X*	Nominal merchanting exports plus exports of services minus exports of R&D and IP products (2014-2019), expressed in real terms using export deflator	Own estimate based on data from CSO (2020) AMECO (2020)
M*	Nominal merchanting imports plus imports of services (1960-2019) minus imports of R&D and IP products (2014-19) minus net aircraft imports (2007-19) minus R&D service imports (2007-19), expressed in real terms using export deflator	Own estimate based on data from CSO (2020) AMECO (2020)
ω*	Modified adjusted wage share (For definition, see equation 1)	Own estimate based on data from CSO (2020) AMECO (2020)
ULC*	Modified nominal unit labour costs = $(W_t/Y^*_t)/(W_{2015}/Y^*_{2015})$ where Y* denotes real GDP minus factor income of re-domiciled companies minus depreciation on R&D service imports, IP, and aircraft leasing. 2015 subscript implies value in the year of comparison.	Own estimate based on data from CSO (2020) AMECO (2020)

Additional MNC-related control variables

AECTR	Average effective corporate tax rate (1966-2018), majority-owned foreign affiliates (MOFAs) of US MNCs in Ireland $AECTR = T^{FA}/\Pi^{FA}$ T^{FA}: total Irish corporation tax paid by US MOFAs Π^{FA}: Pre-tax profits of US MOFAs based in Ireland, minus net interest payments and depreciation	Wright & Zucman (2018) for 1966-2016, updated until 2018 based on BEA (2020)
PWFA	Ratio of pre-tax profits to total compensation of employees US MOFAs in Ireland (1966-2018) $PWFA = \Pi^{FA}/W^{FA}$ Π^{FA}: See above W^{FA}: compensation of employees, US MOFAs in Ireland	Wright & Zucman (2018) for 1966-2016, updated until 2018 based on BEA (2020)

6. General conclusion: What is next for neoliberal globalisation?

Neoliberal globalisation has been marked by some unmistakably clear macroeconomic and regulatory trends around the world, such as falling tariffs and corporate tax rates in addition to rising numbers of regional trade agreements, investment promotion agencies, and special economic zones. In chapters two and four, we saw how these trends could be understood in the context of the growth of footloose MNCs and the intensification of policymakers' efforts to appease and attract MNCs.

These trends create contradictions and tensions, which have been revealed and emphasised in this thesis. As explored in chapter three, MNCs' decisions to offshore production of intermediate goods likely leads to falling wage shares and may ultimately undermine the generation of demand for its final products, resulting in hysteresis and stagnating growth rates. A second example is reflected in the "paradox of tax competition" seen in chapters two (in a short-run model) and four (in a long-run model). This is where the demand-boosting effects of one country acting alone when lowering effective corporate tax rates are reduced or eliminated if other countries act the same way at the same time. For the reasons explored chapters two and four, it seems that most countries' efforts to boost demand through tax competition or some other state commercialising strategy (like the use of special economic zones) have backfired. Only a handful of exceptions may be cited, such as the case of Ireland, which was explored in more detail in chapter five. Even in these exceptional cases, however, there are real questions concerning how successful these beggar-thy-neighbour growth strategies will be going forward.

While not the focus of this thesis, given these tensions and contradictions, questions of the sustainability of the neoliberal economic order abound. Such questions could be considered a natural area of further research. On one hand, there is the question of financial stability, which could be approached in many ways. Firstly, one might wonder about the sustainability of corporate debt in the situation of stagnant growth induced by offshoring or policy competition. Second, household debt in a period of falling wage shares due to offshoring may give cause for concern, especially if emulative consumption behaviour is suspected to be at play (Setterfield & Kim, 2016). Third, there is the debt of the public sector, which—given the likely failure of commercialised state strategies—may rise to levels that are may be particularly worrisome for developing and emerging economies. Lastly, there is the external financial balance, the sustainability of which may deserve further scrutiny in future work as it seems likely that offshoring may fuel trade imbalances, as argued by Palley (2015). Overall, it stands to reason that offshoring and intergovernmental policy competition may give rise to unstable debt dynamics.

On the other hand, there is the question of socio-political stability that deserves further attention. Offshoring-induced deindustrialisation, worsening inequality, and stagnant growth would appear to be a particularly incendiary cocktail of socio-economic ills. Many of the recent anti-globalist political movements have been incited by the failings of modern globalism, according to Palley (2019), Saad-Filho (2020), and others. Yet, these political movements also

tend to be authoritarian, discriminatory, and exclusionary. Saad-Filho (2020, p.134-135) argues that the rise of nationalist politics seen around the world, reflected in Brexit and the election of numerous authoritarian leaders around the world, is a reaction to the "faltering ideological hegemony of neoliberalism and financialisation". Similarly, Palley (2019) cites the US-China trade war and the Trump administration's sanctions on imports of EU goods as evidence that "neoliberal globalization has finally collided with the economic resentments and geopolitical contradictions it spawns" (p. 64), leaving it in state of fragmentation and disintegration. Hence, such developments, that may well spell a threat to the current form of neoliberal globalisation, may in and of themselves be cause for concern.

Yet the future of the global economic order does not have to be viewed in the false dichotomy of business-as-usual neoliberal globalisation versus unilateralist, authoritarian nationalism. Instead, the findings of the work presented herein are generally in accordance with international governmental coordination, whereby policymakers recognise the threat posed by unregulated MNCs (to not only macroeconomic goals but also state sovereignty) and agree to work together across borders to transform neoliberal globalisation.

At the time of writing, it would appear as if there is more appetite than ever before to transform neoliberal globalisation through regulatory multilateralism. The October 2021 agreement of 136 countries to the OECD global corporate tax plan particularly appears to represent a historical break from the trend of intensified corporate tax competition, and thus what Rodrik (2021) refers to as the "end of hyper globalization". In principle, the two pillars of this corporate tax agreement, namely an apportionment mechanism and a global minimum corporate tax rate of 15%, are more or less in line with the policy recommendations seen in chapters two and four, which were based on Saez & Zucman (2020). The global tax agreement is less ambitious and less comprehensive than that seen in Saez & Zucman (2020)—the "carve-out" exemptions are problematic (Barake et al., 2021) and a minimum rate of 15% is still very low by historical standards and when compared to taxes on labour. Moreover, developing countries may not gain as much as they arguably should. Nonetheless, recent research suggest that the European Union and US, in particular, stand to gain billions of euro in corporate tax revenue given the new tax rules (Barake et al., 2021) as MNCs find it increasingly difficult to avoid corporation tax. This agreement would seem, at this early stage at least, to represent something of a break with the relentless policy-competition trend of neoliberal globalisation, and is, as such, to be welcomed.

Moreover, there would appear to be a growing consensus in both public and private sectors that the degree of offshoring may have already gone too far, leaving firms and whole economies vulnerable after unexpected shocks. For example, by causing numerous costly and long-lasting supply disruptions, the Covid-19 pandemic revealed significant limitations and vulnerabilities of the just-in-time global value chain model inherent to neoliberal globalisation (Barbieri et al., 2020). This has led to various firms' reshoring efforts, with one recent survey finding that over 60% of MNCs surveyed are considering either onshoring or "near-shoring" in the next three years (BCI, 2022). Relatedly, policymakers in various countries the world over have vocalised a desire for more self-sufficiency in key goods. Relevant examples include medical supplies such as vaccines and their components during the Covid-19 pandemic (Raza, 2021), as well as energy following the Russian invasion of Ukraine in early 2022. Hence, it appears as if both the private and public sectors may be beginning to realise the extent of

offshoring may have gone too far in recent decades and that reshoring makes strategic if not economic sense.

Of course, the extent of any trend towards reshoring remains to be seen and the appetite for multilateral regulation and policy coordination may be limited to that opposed to only the most egregious forms of profit shifting. As chapter two of this thesis makes clear, countries do not compete only on corporation tax, but also on various other taxes, labour costs, rents, and regulation. Further international regulatory coordination is necessary to restrict competition on these other important policy variables. However, global agreements on minimum rates of tax are far easier to conclude and implement than global or regional agreements on minimum wages or wage growth. Further research could enquire into the possibilities and issues associated with cross-border wage bargaining coordination to limit excessive low-wage-seeking FDI, which should complement the existing work on coordination to limit inflation divergence and trade imbalances (Hein & Truger, 2005).

As ambitious as international policy coordination may seem, failure to reform modern globalisation to limit the worst aspects of its current neoliberal form will likely imply the intensification of the macroeconomic issues identified in this thesis or the exacerbation of the socio-political issues mentioned in this concluding chapter. A good deal more work remains outstanding on other aspects of neoliberal globalisation and the specifics of reform policies. Nonetheless, it is hoped that this thesis could go some way in shedding light on the inner workings of neoliberal globalisation and the macroeconomic consequences of offshoring and intergovernmental policy competition.

References

ADB (2015). *Asian Economic Integration Report 2015*. Asian Development Bank

AMECO (2020). *Annual macro-economic database* (Version Spring 2020) [Data set]. European Commission's Directorate General for Economic and Financial Affairs. https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco/ameco-database_en

Amirahmadi, H., & Wu, W. (1995). Export processing zones in Asia. *Asian Survey*, 35(9), 828-849.

Ashraf, A., Herzer, D., & Nunnenkamp, P. (2016). The effects of Greenfield FDI and cross-border M&As on total factor productivity. *The world economy*, 39(11), 1728-1755

Auvray, T., & Rabinovich, J. (2019). The financialisation–offshoring nexus and the capital accumulation of US non-financial firms. *Cambridge Journal of Economics*, 43(5), 1183-1218

Bank of England (2020). *A millennium of macroeconomic data* (Version 3.1) [Data set] https://www.bankofengland.co.uk/statistics/research-datasets

Barry, F. (2011). Foreign investment and the politics of export profits tax relief 1956, *IIIS Discussion Paper*, No. 357 https://www.tcd.ie/triss/assets/PDFs/iiis/iiisdp357.pdf

Barry, F., & Ó Fathartaigh, M. (2015). The Industrial Development Authority, 1949–58: Establishment, evolution and expansion of influence. *Irish Historical Studies*, 39(155), 460-478.

BEA (2020). *Activities of US Multinational Enterprises* (Version Sep. 2020) [Data set]. United States Bureau of Economic Analysis. https://www.bea.gov/international/di1usdop

Barake, M., Chouc, P., Neef, T., & Zucman, G. (2021). Revenue Effects of the Global Minimum Tax: Country-by-Country Estimates. *EU Tax Observatory Note No. 2* https://www.taxobservatory.eu/revenue-effects-of-the-global-minimum-tax-country-by-country-estimates/

Barbieri, P., Boffelli, A., Elia, S., Fratocchi, L., Kalchschmidt, M., & Samson, D. (2020). What can we learn about reshoring after Covid-19? *Operations Management Research*, 13(3), 131-136.

Barrales, J., & von Arnim, R. (2017). Longer-run distributive cycles: wavelet decompositions for the US, 1948–2011. *Review of Keynesian Economics*, 5(2), 196-217

BCI (2022, February 17). Global Reshoring & Footprint Strategy. *BCI Global*. https://bciglobal.com/en/reshoring-production-back-to-europe-and-the-us-is-on-the-rise-particularly-for-critical-parts-and-final-production-processes

Bhaduri, A, & Marglin, S. (1990). Unemployment and the real wage: The economic basis for contesting political ideologies. *Cambridge Journal of Economics*, 14(4), 375–393

Blecker R.A. (1989). International competition, income distribution and economic growth. *Cambridge Journal of Economics*, 13(3), 395-412

Blecker R.A. (2016). Wage-led versus profit-led demand regimes: the long and the short of it. *Review of Keynesian Economics*, 4(4), 373-390

Blecker R.A., Cauvel, M., & Kim, Y. (2020). Systems estimation of a structural model of distribution and demand in the US economy. *PKES Working Paper Series*, No. 2012. http://www.postkeynesian.net/downloads/working-papers/PKWP2012-merged.pdf

Bohle, D. (2009). Race to the bottom? Transnational companies and reinforced competition in the enlarged European Union. In B. van Apeldoorn, J. Drahokoupil, L. Horn (Eds.) *Contradictions and Limits of Neoliberal European Governance* (pp. 163-186). Palgrave Macmillan.

Bohle, D. (2018). European integration, capitalist diversity and crises trajectories on Europe's Eastern periphery. *New political economy*, 23(2), 239-253.

Bohle, D., & A. Regan. (2021). The comparative political economy of growth models: explaining the continuity of FDI-led growth in Ireland and Hungary. *Politics & Society*, 49(1), 75–106.

Boulhol, H., & Fontagné, L. (2006). Deindustrialisation and the fear of relocations in the industry. *CEPII Working Paper Series*, No. 2006-07, Centre d'études prospectives et d'informations internationales

Bronfenbrenner, K. (2000). *Uneasy Terrain: The Impact of Capital Mobility on Workers, Wages and Union Organizing*, Report to the US Trade Deficit Commission. http://dspace.library.cornell.edu/handle/1813/9849

Burke-Kennedy, E. (2020, January 9). Donohoe warns of €2bn corporation tax loss to State. *The Irish Times.* https://www.irishtimes.com/business/economy/donohoe-warns-of-2bn-corporation-tax-loss-to-state-1.4135085

Cadestin, C., De Backer, K., Desnoyers-James, I., Miroudot, S., Rigo, D., & Ming, Y. (2018). Multinational enterprises and global value chains: the OECD analytical AMNC database, *OECD Trade Policy Papers* No. 211, OECD Publishing.

Chatelais, N, & Peyrat, N. (2008). Are Small Countries Leaders of the European Tax Competition? *CES Working Paper Series* No. 2008.58. Centre National de la Recherche Scientifique

CIIP (2017). *Special economic zones: an operational review of their impacts*, Competitive Industries and Innovation Program, World Bank Group

Cobham, A. & Janský, P. (2018). Global distribution of revenue loss from corporate tax avoidance: re-estimation and country results. *Journal of International Development*, 30(2), 206-232.

Cobham, A. & Janský, P. (2019). Measuring misalignment: The location of US multinationals' economic activity versus the location of their profits. *Development Policy Review*, 37(1), 91-110.

Cobham, A., & Janský, P. (2020). *Estimating illicit financial flows: a critical guide to the data, methodologies, and findings*. Oxford University Press.

Crabbé, K., and Vandenbussche, H., (2009). Are Your Firm's Taxes Set in Warsaw? Spatial Tax Competition in Europe. *CEPR Discussion Paper Series* No. 7159. Centre for Economic Policy Research

CSO (2020). *StatBank database* (Version Sep. 2020) [Data set]. Central Statistics Office of Ireland. https://data.cso.ie

Daly, M. (2016). Is the WTO a world tax organization? A primer for WTO rules for policy makers. *Technical notes and manuals*. International Monetary Fund, Fiscal Affairs Department. https://www.imf.org/external/pubs/ft/tnm/2016/tnm1602.pdf

Danzman, S. B., & Slaski, A. (2021). Explaining deference: why and when do policymakers think FDI needs tax incentives? *Review of International Political Economy*, 1-27. https://doi.org/10.1080/09692290.2021.1885475

De Loecker, J., & Eeckhout, J. (2018). Global market power. *NBER Working Paper Series* No. w24768. https://doi.org/10.3386/w24768

Dellis, K., Sondermann, D., & Vansteenkiste, I. (2017). Determinants of FDI inflows in advanced economies: Does the quality of economic structures matter? *ECB Working Paper Series* No. 2066, European Central Bank

Deprez, J. (2003). International tax policy: recent changes and dynamics under globalization, *Journal of Post Keynesian Economics*, 25(3), 367-384

Devereux, M.P. & Loretz, S. (2013), What Do We Know About Corporate Tax Competition? *National Tax Journal*, 66(3), 745-774

Devereux, M., Lockwood, B., & Redoano, M. (2003) Is there a "Race to the Bottom" in Corporate Taxes? An Overview of Recent Research. *Discussion Paper Series* May 2003. University of Warwick, Centre for the Study of Globalisation and Regionalisation

Drahokoupil, J. (2009). The rise of the competition state in the Visegrád four: Internationalization of the state as a local project. In B. van Apeldoorn, J. Drahokoupil, L. Horn (Eds.) *Contradictions and Limits of Neoliberal European Governance* (pp. 187-208). Palgrave Macmillan

Dunn, S. (2005). John Kenneth Galbraith and the multinational corporation. *Challenge*, 48(2), 90-112.

Dunning, J. H., & Lundan, S. M. (2008). *Multinational enterprises and the global economy*. Cheltenham, Edward Elgar Publishing

Dutt, A.K. (2013): Government spending, aggregate demand, and economic growth, *Review of Keynesian Economics*, 1(1), 105-119

European Commission (2021). *Competition Policy: State aid*. Retrieved 17 May 2021 from https://ec.europa.eu/competition-policy/state-aid_en

Eurostat (2020). *Foreign Affiliates Statistics (FATS)* (Version Sep. 2020) [Data set]. www.ec.europa.eu/eurostat/web/structural-business-statistics/global-value-chains/foreign-affiliates

Farole, T. (2011). *Special economic zones in Africa: Comparing performance and learning from global experience*, IBRD - The World Bank

Feenstra, R. C. (2017). Statistics to measure offshoring and its impact. *NBER Working paper series*, No. w23067. National Bureau of Economic Research. https://www.nber.org/papers/w23067

Feenstra, R. C., & Hanson, G. H. (2001). Global production sharing and rising inequality: A survey of trade and wages. *NBER Working paper series*, No 8372, National Bureau of Economic Research, www.nber.org/system/files/working_papers/w8372/w8372.pdf

Fernandez, R., & Hendrikse, R. (2015). Rich corporations, poor societies: The financialisation of Apple. The Centre for Research on Multinational Corporations (SOMO). https://www.somo.nl/wp-content/uploads/2015/10/Rich-corporations-poor-societies.pdf

Fitzgerald, J. (2018). National accounts for a global economy: the case of Ireland. Economic and Social Research Institute. www.doi.org/10.26504/QEC2018SUMSAFitzgerald

Frank, C. (2018, April 25). Tax Avoidance and the Irish Balance of Payments. *Council on Foreign Relations.* https://www.cfr.org/blog/tax-avoidance-and-irish-balance-payments

Frick, S., Rodríguez-Pose A., & Wong, M. (2019). Toward economically dynamic special economic zones in emerging countries. *Economic Geography*, 95(1): 30–64.

Galbraith, J.K. (1967). *The New Industrial State* (2nd ed.). Penguin.

Garcia-Bernardo, J., Fichtner, J., Takes, F.W., Heemskerk, E.M. (2017). Uncovering offshore financial centers: Conduits and sinks in the global corporate ownership network. *Scientific Reports*, 7(1), 1-10

Garcimartín, C., Rivas, L.A., & De Sarralde, S.D. (2008). Accounting for Irish growth: a balance-of-payments-constraint approach, *Journal of Post Keynesian Economics*, 30(3), 409–433

Görg, H., & Ruane, F. P. (1997). Reflections on Irish industrial policy towards foreign direct investment. *Trinity Economic Papers Series* No. 97/3, Trinity College Dublin https://www.tcd.ie/Economics/TEP/1997/1997%20Policy%20Papers/973p.pdf

Grossman, G. M., & Rossi-Hansberg, E. (2008). Trading tasks: A simple theory of offshoring. *American Economic Review*, *98*(5), 1978-97.

Guschanski, A., & Onaran, Ö. (2021). The decline in the wage share: falling bargaining power of labour or technological progress? Industry-level evidence from the OECD. *Socio-Economic Review*. https://doi.org/10.1093/ser/mwaa031

Helpman, E. (1984). *A Simple Theory of International Trade with Multinational Corporations. Journal of Political Economy, 92(3), 451–471.*

Hein, E. (2012). *The macroeconomics of finance-dominated capitalism and its crisis*. Edward Elgar Publishing

Hein, E. (2014). *Distribution and growth after Keynes: A Post-Keynesian guide*. Edward Elgar Publishing

Hein, E., & Truger, A. (2005). European Monetary Union: nominal convergence, real divergence and slow growth? *Structural Change and Economic Dynamics*, 16(1), 7-33.

Hines Jr, J. R. (2010). Treasure islands. *Journal of Economic Perspectives*, 24(4), 103-26.

Henningsen, A., & Hamann, J.D. (2007). systemfit: A package for estimating systems of simultaneous equations in R. *Journal of statistical software*, 23(4), 1-40

Hutton, B. (2019, September 7). Donohoe listening to Honohan's warning on corporation tax. *The Irish Times*. https://www.irishtimes.com/business/economy/donohoe-listening-to-honohan-s-warning-on-corporation-tax-1.4011293

Huwart, J., & Verdier, L. (2013). *OECD Insights Economic Globalisation Origins and consequences: Origins and consequences*. OECD Publishing.

IDA (2016). *Taxation in Ireland 2016*. IDA Ireland. https://www.idaireland.com /newsroom/publications/taxation_ireland.

IDA (n.d.). *Companies in Ireland*. IDA Ireland. Retrieved December 7, 2020, from https://www.idaireland.com/doing-business-here/company-listing.

IMF (2017). *Tackling Inequality: Statistical Appendix Database of the IMF Fiscal Monitor 2017* [Data set]. International Monetary Fund

Jorgensen, D. W. (1963). Capital Theory and Investment Behaviour. *American Economic Review* 53, 247–259

Kalecki, M. (1937a). The principle of increasing risk. *Economica*, 4(16), 440-447

Kalecki, M. (1937b). A Theory of Commodity, Income, and Capital Taxation. *The Economic Journal*, 47(187), 444

Kalecki, M. (1944)., Three ways to full employment. In F.A. Burchardt, M. Kalecki, G.D.N. Worswick, E.F. Schumacher, T. Balogh and K. Mandelbaum (Eds), *The Economics of Full Employment: Six Studies in Applied Economics* (pp. 39–53). Blackwell

Kalecki, M. (1966). *Studies in the theory of business cycles: 1933-1939.* Blackwell

Kamal, F. (2018). A portrait of US factoryless goods producers. *NBER Working Paper Series* No. w25193. https:// doi.org/10.3386/w25193

Keynes, J. M. (1936). *General theory of employment, interest and money.* Macmillan

Khan, U., Nallareddy, S., & Rouen, E. (2020). The role of taxes in the disconnect between corporate performance and economic growth. *Management Science*, 66(11), 5427-5447.

Kiefer, D., & Rada, C. (2015). Profit maximising goes global: The race to the bottom. *Cambridge Journal of Economics*, 39(5), 1333-1350

Kinsella, S. (2013). Was Ireland's Celtic Tiger Period Profit-led or Wage-led? *Review of Political Economy*, 25(4), 572–585

Kurz, H.D. (1990). Technical change, growth and distribution: A steady-state approach to 'unsteady' growth. In H.D. Kurz (Ed.) *Capital, Distribution and Effective Demand* (pp. 421-448). Polity Press

Lavoie, M. (2014). *Post-Keynesian Economics: New Foundations*. Edward Elgar Publishing.

Mankiw, N. G., Weinzierl, M., & Yagan, D. (2009). Optimal taxation in theory and practice. *Journal of Economic Perspectives*, 23(4), 147-74.

Martincus, C. V., & Sztajerowska, M. 2019. *How to solve the investment promotion puzzle: A Mapping of investment promotion agencies in Latin America and the Caribbean and OECD countries*. Inter-American Development Bank.

Milberg, W. (2006). Pricing and profits under globalized competition: A Post Keynesian perspective on US economic hegemony. *Schwartz Center for Economic Policy Analysis Working Paper Series*, No. 5, New School for Social Research

Milberg, W., & Winkler, D. (2010). Financialisation and the dynamics of offshoring in the USA. *Cambridge Journal of Economics,* 34(2), 275-293

Milberg, W., & Winkler, D. (2013). *Outsourcing economics: global value chains in capitalist development*. Cambridge University Press.

Mott, T., & Slattery, E. (1994). Tax incidence and macroeconomic effects in a Kaleckian model when profits finance affects investment and prices may respond to taxes. *Journal of Post Keynesian Economics*, 16(3), 391-409

Nabeshima, K. & Yusuf, S. (2012). *Some small countries do it better: Rapid growth and its causes in Singapore, Finland, and Ireland*. World Bank Publications.

NBER-CES. (2021). *Manufacturing Industry Database* (Version Dec. 2021) [Data set]. https://www.nber.org/research/data/nber-ces-manufacturing-industry-database

Narula, R., & Zhan, J. (2019). Using special economic zones to facilitate development: Policy implications, *Transnational Corporations Journal*, 26(2), 1-25

Obst, T., Onaran, Ö., & Nikolaidi, M. (2020). The effects of income distribution and fiscal policy on aggregate demand, investment and the budget balance: the case of Europe. *Cambridge Journal of Economics,* 44(6), 1221-1243

OECD (2007). *Offshoring and employment: Trends and impacts*. Organisation for Economic Co-operation and Development. OECD Publishing

OECD (2008), Tax Effects on Foreign Direct Investment, *Policy Briefs*, OECD Publishing, https://www.oecd.org/investment/investment-policy/40152903.pdf

OECD (2018a). Multinational enterprises in the global economy: heavily debated but hardly measured. *OECD Policy notes*. https://www.oecd.org/industry/ind/MNCs-in-the-global-economy-policy-note.pdf

OECD (2018b). *Mapping of investment promotion agencies in OECD Countries*. OECD & Inter-American Development Bank

OECD (2019a), *Revenue Statistics: 1965-2019* (Version Aug. 2019) [Data set], OECD, http://dx.doi.org/10.1787/9789264283183-en.

OECD (2019b), *AMNC Database - Activity of Multinational Enterprises* (Version Aug. 2019) [Data set], OECD. www.oe.cd/amne

OECD (2020). *Corporate Tax Statistics* (2nd ed.). OECD Publishing

OECD (2021). *Revenue statistics* (Version Feb. 2021) [Data set]. Organisation for Economic Cooperation and Development. https://stats.oecd.org/Index.aspx?DataSetCode=REV

Onaran, Ö., & Obst, T. (2016). Wage-led growth in the EU15 member-states: The effects of income distribution on growth, investment, trade balance and inflation. *Cambridge Journal of Economics*, 40(6), 1517–1551

Overesch, M. & Rincke, J. (2009), Competition from Low-wage Countries and the Decline of Corporate Tax Rates: Evidence from European Integration. *World Economy*, 32(9), 1348-1364.

Overesch, M., & Rincke, J. (2011). What drives corporate tax rates down? A reassessment of globalization, tax competition, and dynamic adjustment to shocks. *The Scandinavian Journal of Economics*, 113(3), 579-602.

Oyvat, C., Öztunalı, O., & Elgin, C. (2020). Wage-led versus profit-led demand: A comprehensive empirical analysis. *Metroeconomica*, 71(3), 458–486

Palan, R. (1998). Trying to have your cake and eating it: how and why the state system has created offshore. *International Studies Quarterly*, 42(4), 625-643.

Palan, R. (2002). Tax Havens and the Commercialization of State Sovereignty. *International Organization*, 56(1), 151-176.

Palan, R. (2009, October 1). History of tax havens. *History & Policy: Policy Papers*. http://www.historyandpolicy.org/policy-papers/papers/history-of-tax-havens

Palley, T. I. (2013). *Financialization: the economics of finance capital domination*. Springer.

Palley, T. I. (2015). The theory of global imbalances: mainstream economics vs structural Keynesianism. *Review of Keynesian Economics*, 3(1), 45–62

Palley, T. I. (2018). Three globalizations, not two: Rethinking the history and economics of trade and globalization. *FMM Working Paper Series* No. 18, 1-34

Palley, T. I. (2019). The Fracturing of Globalization: Implications of Economic Resentments and Geopolitical Contradictions. *Challenge*, 62(1), 49–66.

Partington, R. (2021, April 7). G20 takes step towards global minimum corporate tax rate. *The Guardian*. https://www.theguardian.com/business/2021/apr/07/g20-global-minimum-corporate-tax-rate-finance-ministers-us-avoidance

Rabinovich, J. (2021). Financialisation and the 'supply-side' face of the investment-profit puzzle. *Journal of Post Keynesian Economics*, 44(3), 434-462.

Raza, W., Grumiller, J., Grohs, H., Essletzbichler, J., & Pintar, N. (2021). Post Covid-19 value chain: options for reshoring production back to Europe in a globalised economy. European Union–Directorate General for External Policies of the Union. https://www.europarl.europa.eu/RegData/etudes/STUD/2021/653626/EXPO_STU(2021)653626_EN.pdf

Reed, W.R. (2015). On the practice of lagging variables to avoid simultaneity. *Oxford Bulletin of Economics and Statistics*, 77(6), 897-905

Regan, A., & Brazys, S. (2018). Celtic phoenix or leprechaun economics? The politics of an FDI-led growth model in Europe. *New Political Economy,* 23(2), 223-238

Rodrik, D. (2021, June 7). The G7 Tax Clampdown and the End of Hyper-Globalization. *Project Syndicate*. https://www.project-syndicate.org/commentary/g7-corporate-tax-agreement-end-of-hyper-globalization-by-dani-rodrik-2021-06

Saad-Filho, A. (2021). Endgame: from crisis in neoliberalism to crises of neoliberalism. *Human Geography*, 14(1), 133-137

Saez, E., & Zucman, G. (2020). *The triumph of injustice: How the rich dodge taxes and how to make them pay*. (Paperback edition) WW Norton & Company

Schmidt, P. (1990). Three-stage least squares with different instruments for different equations. *Journal of Econometrics*, 43(3), 389-394

Schröder, E. (2020). Offshoring, employment, and aggregate demand. *Journal of Evolutionary Economics*, 30(1), 179-204.

Setterfield, M., & Blecker, R. A. (2022). Structural change in the US Phillips curve, 1948-2021: the role of power and institutions. *PKES Working Paper Series* No. PKWP2208, Post Keynesian Economics Society.

Setterfield, M., & Kim, Y. K. (2016). Debt servicing, aggregate consumption, and growth. *Structural Change and Economic Dynamics*, *36*, 22-33.

Singer, H. W. (1950). The distribution of gains between borrowing and investing countries. *American Economic Review*, 40(2), 473-485.

Skott, P., & Ryoo, S. (2008). Macroeconomic implications of financialisation. *Cambridge Journal of Economics*, 32(6), 827-862.

Soon, T. W., & Stoever, W. (1996). Foreign Investment and Economic Development in Singapore: A Policy-Oriented Approach. *The Journal of Developing Areas*, 30(3), 317-340.

Stewart, J. (2018). MNC tax strategies and Ireland. *Critical perspectives on international business*, 14(4), 338-36

Stockhammer, E. (2004). Financialisation and the slowdown of accumulation. *Cambridge journal of economics*, 28(5), 719-741.

Stockhammer, E., & Stehrer, R. (2011). Goodwin or Kalecki in demand? Functional income distribution and aggregate demand in the short run. *Review of Radical Political Economics*, 43(4), 506-522

Tørsløv, T., Wier, L., & Zucman, G. (2018). The Missing Profits of Nations. *NBER Working Paper Series* No. w24701. https://doi.org/10.3386/w24701

UNCTAD (2018). *World Investment Report 2018: Investment and New Industrial Policies*. United Nations. http://unctad.org/en/PublicationsLibrary/wir2018_en.pdf

UNCTAD (2019). *World investment report 2019*: *Special economic zones*. United Nations. www.unctad.org/en/PublicationsLibrary/wir2019_en.pdf

UNstat (2021). *National accounts - Analysis of main aggregates* (Version Feb. 2021) [Data set]. https://unstats.un.org/unsd/snaama/

Van Dijk, M., Weyzig, F., & Murphy, R. (2006). *The Netherlands: a tax haven?* Centre for Research on Multinational Corporations. http://dx.doi.org/10.2139/ssrn.1660372

Venables, A. J. (1999). Fragmentation and multinational production. *European economic review*, *43*(4-6), 935-945.

Wilson, J. D. (1999). Theories of tax competition. *National tax journal*, 52(2), 269-304

Winner, H. (2005). Has tax competition emerged in OECD countries? Evidence from panel data. *International Tax and Public Finance*, 12(5), 667-687

Woodgate, R. (2020). Can tax competition boost demand? Causes and consequences of the global race to the bottom in corporate tax rates. *Review of Keynesian Economics*, 8(4), 512-535

Woodgate, R. (2021a). Profit-led in effect or in appearance alone? Estimating the Irish demand regime given the influence of multinational enterprises. *Review of Evolutionary Political Economy*, 1-32. https://link.springer.com/article/10.1007/s43253-021-00056-1

Woodgate, R. (2021b). Multinational corporations and commercialised states: Can state aid serve as the basis for an FDI-driven growth strategy? *IPE working paper series* No. 161/2021. Institute for International Political Economy Berlin

Woodgate, R. (in press). Offshoring via vertical FDI in a long-run Kaleckian model. *Journal of Post-Keynesian Economics*.

World Bank (2020). *World Development Indicators* (Version Sep. 2020) [Data set] https://data.worldbank.org

Wright, T., & Zucman, G. (2018). The Exorbitant Tax Privilege. *NBER Working Paper Series* No. w24983. https://doi.org/10.3386/w24983

WTO (2020). Regional Trade Agreements (Version Sep. 2020) [Data set]. World Trade Organisation. https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx

You, J.I., & Dutt, A.K. (1996) Government debt, income distribution and growth, *Cambridge Journal of Economics*, 20 (3), 335-351

Zellner, A., & Theil, H. (1962). Three-Stage Least Squares: Simultaneous Estimation of Simultaneous Equations. *Econometrica*, 30(1), 54-78

Zucman, G. (2014). Taxing across Borders: Tracking Personal Wealth and Corporate Profit. *Journal of Economic Perspectives*, 28(4), 121–148

Zucman, G. (2019, February). Taxing Multinational Corporations in the 21st Century. *Policy Briefs* No. 10. Economics for Inclusive Prosperity. https://econfip.org/policy-brief/taxing-multinational-corporations-in-the-21st-century