

The Commodities Fetish? Financialisation and Finance Capital in the US Oil Industry¹

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The last two decades have seen considerable debate around the concept of financialisation, a term that first originated in Marxist work but that is now widely employed across a variety of different theoretical traditions. In its most general sense, financialisation captures the clear ascendance of financial markets, and the evident ways in which financial imperatives have come to impose themselves over every sphere of human life (Krippner 2005; Mader et al 2020; Epstein 2005, Martin 2002). A frequently cited definition locates financialisation as the ‘the increasing role of financial markets, financial motives, financial actors, and financial institutions in the operation of the domestic and international economies’ (Epstein 2005, p.3). This shift has been enabled through the development of myriad financial instruments and techniques, most significantly those based upon the securitisation of assets and derivative contracts. Taken as whole, these new instruments have greatly expanded the size of global financial markets and the volume of cross-border financial flows (Durand 2014).

Amidst this growing weight of financial markets and processes, a key focus of debate has been the potential relationship between financialisation and increased price volatility for various commodities (McGill 2018). Discussion around this topic initially emerged in the first decade of the 2000s, when an array of new financial actors (including investment banks, hedge funds, pension funds, and asset management firms) began to direct huge amounts of capital into commodity futures markets – centralised exchanges where contracts to buy and sell specified amounts of a commodity at some point in the future are traded. The involvement of these financial actors in commodity futures upended the traditional structure of commodity markets, particularly the hitherto dominant role of individuals and firms that were directly engaged in the production and exchange of physical commodities (Clapp 2015). Commodities were said to have become ‘financialised’ – transformed into new financial assets that could be traded and speculated on in financial markets, with little concern towards physical delivery. For many analysts, these speculative activities served to disconnect commodity prices from market ‘fundamentals’ (such as supply and demand), and were thus seen as the prime culprit in an unprecedented spike in commodity prices that occurred across a broad range of different markets between 2003 and 2008 – including energy, agriculture, and metals (Masters 2008).

Much of this work on commodity financialisation is extremely rich and carries important real-world implications, not least for poorer countries that may be highly dependent upon global food and energy imports. Nonetheless, the near-exclusive focus of this literature on the question of price formation has served to elide other fundamental questions, most notably the relationship between financialisation and the changing patterns of capital ownership and control across the wider commodity circuit. In this respect, much of the literature on commodity financialisation tends to adopt a dualistic approach to financial markets and physical producers, where financial and non-financial activities are assumed to be externally-related and counterposed to one another. Within this framing, a supposedly determinant financial sphere imposes itself upon the moments

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of production and circulation of value; in turn, these latter moments are treated as discrete and ancillary to processes of financial accumulation.

In what follows, I argue that the roots of this prevailing analytical separation of the financial and non-financial spheres lie in a mistaken acceptance of the fetish character of interest-bearing capital (IBC) – a view that the exchange of loanable sums of capital represents a relationship between money-capitalists rather than a relationship to the moment of production. Against such dichotomous readings, my goal is to draw out how the financialisation of commodities is ‘internally-related’ (Ollman 2003) to the moments of production and circulation within a unitary circuit of capital.² Most specifically, I will show that financialisation needs to be understood as part of the reworking of capitalist power over commodity circuits, expressed through the combined centralisation and concentration of capital over the money, productive and commercial moments. Building upon other Marxist work, I argue that this process of class formation is embodied in the increased power of a distinct class of *finance capital* – understood here as the entwined ownership and control of capital across the commodity circuit *in toto* (and not in the distorted sense of ‘bank control of industry’ that is sometimes advanced in the literature).

These arguments are developed below through a focus on the world’s most important commodity – oil. In the initial part of the paper, I lay out some of the Marxist debate around financialisation, with particular attention to the concepts of interest-bearing capital and finance capital. I then turn to a survey of the general literature on the financialisation of commodities, including oil. Following this theoretical framing, the second half of the paper presents an original empirical investigation of the composition of class power across the oil commodity circuit in the United States. This empirical analysis first examines US oil contracts on the New York Mercantile Exchange (NYMEX), one of the most important futures markets in the world and where futures and options contracts for the global oil benchmark, West Texas Intermediate (WTI), are traded. Here, I analyse 20 years of weekly trading data to show how oil has been financialised, i.e. abstracted from its concrete use value to become a financial asset traded by large financial institutions – including investment banks, Asset Management Firms, and hedge funds/private equity firms. I then present a detailed study of more than 160 oil and energy-related firms in the US, mapping the nature of capital ownership across these firms and their relationship to oil’s financial markets. This analysis confirms that the leading drivers of the financialisation of oil are simultaneously deeply imbricated in the entire oil value chain, from exploration and production through to pipelines, transportation, and storage, and from services and refining and processing through to the generation and transformation of power.

At a more general level, this argument is intended as a contribution to strategic debates around efforts to halt anthropogenic climate change. Most notably, by mapping the structural weight and connections between different capitalist actors involved in accumulation across the oil sector, we gain a better understanding of the ultimate dynamics (and beneficiaries) of the carbon economy. Banks, investment funds and other institutional holders of money-capital are not simply passive vehicles that profit from their investments in oil companies (and who might, therefore, be collectively ‘shamed’

² Ollman’s explication of the concept of ‘internal relations’ is based upon Marx’s perspective that the relations existing between objects (and concepts) should not be considered external to the objects themselves but as part of what actually constitutes them. Any object under study needs to be seen as ‘relations, containing in themselves, as integral elements of what they are, those parts with which we tend to see them externally tied’ (Ollman 2003, p. 25).

into doing otherwise).³ Rather, the complex relationship between oil's financialisation and its necessary production (and circulation) as a physical commodity is reflected in the growing overlap of capital ownership across all moments of the oil circuit. The class of finance capital that superintends this process must be viewed as a leading, *and systemic*, driver of climate change – not simply an accidental or contingent epiphenomenon.

2. Financialisation, Interest-Bearing Capital, and Finance Capital

Broadly speaking, the literature on financialisation encompasses three distinct theoretical concerns. The first of these relates to the roots of financialisation and its implications for capitalist periodisation – whether to understand financialisation as indicative of a new stage or marker of neoliberal capitalism (Arrighi 1994; Boyer 2000; Lapavistas 2013; Fine 2010a), a symptom of capitalist stagnation in an environment of monopoly and over-accumulation (Bellamy-Foster 2010; Ivanova 2017), or the outcome of declining profit rates and long-term structural crisis (Brenner 2006; Harman 2009; Roberts 2016; Shaikh 2011). A second focus of the literature explores the varied implications of financialisation for social, political, and economic power. Here, contributions have investigated the role of financialisation in enabling US hegemony and emergent patterns of geopolitical competition (Crotty 2005; Dumenil and Levy 2005; Panitch and Gindin 2012), as well as the distributional impacts of financialisation on wealth and inequality (Stockhammer 2012; Zalewski and Whalen 2010; Lapavistas 2013; Montgomerie 2009). Finally, a third strand of the literature analyses how financialisation is changing institutional and behavioural patterns – including those of banks (Dos Santos 2009), households and individuals (Martin 2002; der Zwan 2014), and firms (Froud et al. 2000; Stockhammer 2004).⁴

Work across these three themes has generated significant insights. Nonetheless, a basic problem continues to mark much of the literature: a high degree of imprecision and ambiguity around *what the term financialisation actually means* (Christophers 2015). As Fine points out, financialisation is often understood somewhat tautologically as simply meaning 'more' finance (Christophers and Fine 2020, p.21) – with little effort given to clarifying what distinguishes financial from non-financial activities, or to precisely locating the place of finance within the overall circuit of capital. In this respect, Christophers has commented that the concept lies “somewhere in between” the extremes of “powerful and innovative theory ... and superficial and redundant label”, claiming that it has made an “at best, debatable” specific theoretical contribution to social science (Christophers 2015, p.187). Christophers and others (Stockhammer 2004; Christophers 2015; Davis 2017; Christophers and Fine 2020) underline here the large array of different meanings attached to financialisation that have generated a set of associated empirical and methodological challenges: which indicators to use in measuring financialisation, what time frames to consider in comparing different case studies, and how to distinguish the trajectories of financialisation across various parts of the world market (Hanich 2016; Rethel 2010).

³ This is not meant as a criticism of divestment campaigns as a tactic that can play a significant role in confronting and raising awareness around the different actors involved in climate change. On the contrary, it is to argue for a more structural consideration of the systemic role played by these financial actors within the oil circuit.

⁴ As is evident from the works cited in this paragraph, financialisation is very much a 21st century concept. One important exception to this is Giovanni Arrighi's influential book, *The Long Twentieth Century* (1994), which presciently captured many of the themes in more recent debate. Drawing upon Braudel and Wallerstein, Arrighi argued that world hegemonies typically experience a period of financial expansion during their phase of decline. This financial expansion is a result of the pressures of overaccumulation, and (somewhat paradoxically) allows the declining hegemon to realise on-going returns on investment by financing the rise of the new hegemon. Arrighi's argument is distinct from much of the recent financialisation literature in that it explicitly sees financial expansion as a recurrent historical phase of capitalist development at the world scale (see Christophers 2015 for a discussion of this point).

Given these well-founded critiques, how might financialisation be better understood in an *analytical* sense – i.e. in ways that can avoid the tautological and overly-descriptive (and therefore redundant) definitions so often encountered in the literature? In this regard, one of the more robust theoretical accounts is that offered by Ben Fine, who tethers his understanding of finance and financialisation to a conceptualisation of value⁵ and its movement through the wider circuit of capital – most explicitly through his use of Marx’s category of interest-bearing capital (IBC) (Fine 2010a, 2010b, 2013; Christophers and Fine 2020). Following Marx, Fine understands IBC as surplus capital – capital drawn from idle money or ‘hoards’ – that is lent by money-capitalists to other capitalists for the purposes of producing profit. This loanable capital may be put to use in the exploitation of living labour, thereby generating surplus value, a part of which the lender of IBC then appropriates in the phenomenal form of interest. IBC may also be lent to other economic agents (e.g. merchants, governments, landowners, workers) for activities that are not productive of surplus value (Harvey 1982, p.257) – nonetheless, the ultimate source of the interest appropriated by the lender remains the total surplus value produced at a societal level.

As with all his conceptual categories, Marx grounded his understanding of IBC in its historical genesis (see, in particular, Capital Volume III and Theories of Surplus Value), arguing that IBC’s “antiquated form” was usurer’s capital and “its twin brother, merchant’s capital”, which existed as “antediluvian forms of capital ... long preced[ing] the capitalist mode of production and ... found in the most diverse economic formations of society” (Marx 1959, p.593, cited in McNeill p.281-282). With the development of capitalism, interest-bearing capital moves from being a separate sphere (i.e. usurers or merchant’s capital) to being one that is incorporated – ‘subjugated’ is how Marx frequently refers to this process – within the sphere of value production.

According to Fine, IBC today sits “at the heart of financialization ... in that IBC has expanded enormously both intensively (within existing activities) and extensively (to new areas of applications) over the past three decades” (Christophers and Fine 2020, p.23). Financialised capitalism, in other words, is defined by the unprecedented enlargement of IBC throughout all spheres of human activity, such that it now mediates all capitalist social relations – including those between capitals, as well as those between capital and labour (McNally 2009, p.56). The huge expansion of financial markets – facilitated by the proliferation of new financial instruments that link past, present and future – is a direct form of appearance of this envelopment of all aspects of social life by IBC. As Fine notes, this understanding of financialisation helps move the discussion beyond the “amorphous and unstructured definition arising from Epstein (2005) in which financialization is seen simply as more of finance and its effects” (Christophers and Fine 2020, p.21).

Within this account of financialisation, there are two key features of IBC that deserve emphasis. The first of these is that IBC is not directly productive of surplus value – although it may expand the possibility for value production (through its role in intensifying productivity or speeding up the turnover-time of capital within the productive sphere). In turn, when the owner of IBC advances a sum of money to

⁵ For a recent discussion on Marxian value theory and financialisation see Christophers and Fine (2020). In this discussion, Christophers notes that if we are to understand financialisation, then how “we think value theory remains indispensable ... [it] cannot be dodged” (Christophers and Fine 2020, p. 25-26). Fine presents a defence of the classical Marxist view of finance as unproductive of value, while Christophers remains unsatisfied with this perspective (see also Christophers 2018).

another capitalist, they gain ownership rights over value that is yet to be produced. Marx described these drawing rights as ‘fictitious capital’, ownership titles (such as shares, bonds, etc.) that represent a claim on “a future stream of revenues generated by an asset, and which can be bought and sold independently of the asset itself” (McNeil 2020, p. 283). This is “value created in exchange ahead of the production and realization of (surplus) value” (Labban 2010, p.545). And because fictitious capital represents a title of ownership to future value, it has a price that can be traded “in anticipation of the actual production and realization of value in the future” (Labban 2010, p.545; see also Harvey 1982). As a consequence of stagnant profit rates and the persistent overaccumulation of capital, the volume of fictitious capital has expanded to unprecedented levels (Durand 2014) and has become “the object of incessant trading in globalised financial markets ... lodged in very powerful financial conglomerates possessing the capacity to dictate their policies to governments through a variety of economic channels and political institutions” (Chesnais 2016, p.37).

A second key feature of IBC flows from this first observation. While IBC does not directly produce value, but rather appropriates part of the total surplus value – this act of appropriation *appears* to us as if value has been generated by the productive capitalist in exchange with the lender of IBC (M – M’). Marx describes this form of appearance as a fetish – or relation “turned upside down in the consciousness of men” (Marx 1971, p.476) – because it seems to us that the lender of IBC only has relations with other capitalists and not with the wage-worker, yet ultimately the source of the value appropriated by the money-capitalist is actually found in the labour-capital relation (see McNeil 2020, Chapter 5, for an illuminating discussion of this point).⁶ In other words, we mistake the form of appearance that the value-relation takes in our consciousness (surplus money begetting more money through the process of exchange) for the relation itself (Sayer 1987).⁷ In this respect, Marx is insistent on repeatedly drawing attention to IBC as a fetish, describing it *inter alia* as the “pure fetish form” (1959, p.393), “the consummate automatic fetish” (1971, p.455), the “mystification of capital in its most extreme form” (1971, p.494), “the most extreme inversion and materialisation of production relations” (1971, p.462), and “the complete *objectification, inversion, and derangement* of capital ... a Moloch demanding the whole world as a sacrifice belonging to it of right” (Marx 1971: 456; italics in original).

Much of the discussion around commodity financialisation is marked precisely by an uncritical internalisation of this kind of fetishism. Specifically, there is a tendency to take the ideological forms that reality takes – a sharp discontinuity between finance and the so-called ‘real’ economy – as reality itself, instead of recognising financial accumulation as a specific moment of the circuit of capital (represented in the exchange of IBC) that is distinct but nonetheless internally-related (Ollman 2003) to the labour-capital relation. Analytically and methodologically, this fetish translates into a kind of dualism, which treats financial markets as a disconnected and autonomous site of accumulation, rather than focusing attention on the mutually-constituted relationships between financial markets and the circulation and production of physical commodities.

⁶ Elsewhere, Marx writes: “One portion of profit, as opposed to the other, separates itself entirely from the relationship of capital as such and appears as arising not out of the function of exploiting wage-labour, but out of the wage-labour of the capitalist himself. In contrast thereto, interest then seems to be independent both of the labourer’s wage-labour and the capitalist’s own labour, and to arise from capital as its own independent source. If capital originally appeared on the surface of circulation as a fetishism of capital, as a value-creating value, so it now appears again in the form of interest-bearing capital, as in its most estranged and characteristic form. (Marx 1959, p. 829, cited in McNeil 2020)

⁷ I draw this argument from Sayer (1987), which presents a highly perceptive account of ideological forms and the process of abstraction. See Banaji 2010 for an analogous argument around the relation between wages and the concept of unfree labour.

A critique of this fetish can provide significant insight into a theme that has not been adequately explored in the wider literature on commodities: *the relationship between financialisation and processes of capitalist class formation*. By approaching the fetish as an ‘inversion’ of reality, we can see financialisation as not simply an expansion of IBC in the form of fictitious capital through vastly widened financial markets, but as actually representing the tendential combination of the financial, productive, and commercial circuits within closely linked ownership structures. In other words, at the level of class composition, financialisation embodies a closer imbrication of the financial and non-financial spheres – despite the formal appearance otherwise – and the growing together of these different moments of accumulation under the hegemony of what is best described as ‘finance capital’ (Harvey 1982; Serfati 2011; Chesnais 2016). The latter term is used here advisedly, to indicate the increasingly integrated and monopolised control over different moments of the circuit of capital by a tightly linked class of capital owners (not at all in the frequently misconstrued sense of ‘the domination of banks over industry’).⁸ As Francois Chesnais notes, finance capital represents the “*simultaneous and combined* centralisation/concentration of money capital, industrial capital, and merchant or commercial capital” (2016, p.8, italics in original), regardless of the different institutional paths this might take globally. Rejecting any firm division between the productive, financial, and commercial spheres – in effect, refusing to take the fetish as reality – is not simply a matter for contemporary capitalism. As Jairus Banaji (2010; 2020) demonstrates so convincingly, the growing together of different types of capital (e.g. merchant and industrial capitals) within single ownership structures was precisely the path taken in the actual historical development of capitalism. Indeed, as cited above, this is in accordance with Marx’s own comments on the early historical genesis of IBC as usurers’ capital.

The Financialisation of Oil

Given this general theoretical framework, it is now possible to turn more concretely to the financialisation of oil. As noted earlier, a massive influx of new financial flows entered global commodity markets through the first decade of the 2000s, with one study estimating a 45-fold increase in these flows between 2001 and 2011, reaching \$450 billion in 2011 (Bicchetti and Maystre 2012, p.4). These investments predominantly came from an array of new financial actors not traditionally known for their involvement in commodities, and who had been permitted to enter the commodity business following the de-regulation of commodity markets in the early 2000s. This was a moment of intense change in US financial markets – and a salient reminder that law is always the midwife of market innovation – with a raft of new regulations (notably the Commodity Futures Modernization Act of 2000) opening US commodity markets to global investors and allowing large investment banks and other financial institutions to trade in commodity derivatives with little regulatory oversight (Omarova 2013; Conlon 2018). Derivative contracts traded on commodity futures markets consequently grew sevenfold in volume between 2000 and 2010 (UNCTAD 2011, p.15).

⁸ As is well-known, the term finance capital originates in the classic work of Rudolf Hilferding (1981) who suggested the domination of banks over industry as a defining and universal feature of advanced capitalism (subsequently adopted by Lenin as part of his theorisation of imperialism). There is no space here to provide a full genealogy of the term (see Overbeek 1980; Harvey 1982; Lapavistas 2009), but contemporary notions of finance capital have moved away from simply equating finance capital with banks or financial corporations. Instead, a focus is placed on the increasingly unified control over different moments of the circuits of capital, articulated through the “contradiction-laden flow of interest-bearing capital” (Harvey 1982, p.317). Harvey terms this a “process view of finance capital” (1982, p. 283). Krippner (2015), for example, discusses this in relation to the US; Chesnais (2016) for US, Britain, France, Germany; Serfati (2011) analyzes transnational corporations through the lens of finance capital; Hanich (2019) looks at finance capital and Islamic banking in the Gulf states of the Middle East.

Oil is the largest, most liquid, and most interconnected of these futures markets (Alquist and Kilian 2007; Büyükşahin et al. 2009; Tang and Xiong 2011). Oil futures enable traders to fix a price for selling (or purchasing) a set quantity of oil (specified in barrels) at a particular future date. Such derivatives can be bought and sold on a range of futures markets, the most prominent of which are the NYMEX (where the North American oil benchmark, West Texas Intermediate (WTI), is traded) and the Intercontinental Exchange (ICE), where Brent Oil futures can be bought and sold. Although the oil contracts traded on NYMEX and ICE contain commitments to deliver physical oil at some point in the future, close to 100% of these contracts are never physically delivered. Instead, these are paper transactions, with traders ‘offsetting’ their positions by buying or selling the equal and opposite trade towards the end of the contract expiry period.⁹ These contracts are useful to oil producers (or consumers) who seek to guarantee a particular price for their sale (or purchase) of oil in future months.¹⁰ But as with any futures market, these contracts also allow traders who do not own or want any physical barrels to trade in ‘paper barrels’ – with the hope that the future price of these barrels will appreciate.¹¹

Through the early 2000s, billions of dollars were directed into oil futures by financial firms and other institutional investors (such as hedge funds) who looked to the highly profitable opportunities presented by this trade in paper barrels. At the most general level, the ‘financialisation of oil’ refers specifically to these kinds of investments – activity in oil futures that is “driven purely by financial interests through the large-scale entry of financial investors” (Staritz et al 2018, p.4). According to one well-known former hedge fund manager, Michael Masters, the total increase in demand for ‘paper barrels’ in the oil futures market between 2003 and 2008 reached 848 million barrels, a figure that was roughly equivalent to the increase in physical demand for oil from China (Masters 2008).¹² Although this was a generalised phenomenon experienced across the food, metals, and agricultural sectors, the influx of financial flows into oil futures far surpassed that of other commodities – for the large financial firms who drove these flows, oil had become a distinct *financial* asset within a portfolio of wider investment strategies.

Significantly, however, this deepening financialisation of oil occurred alongside an unprecedented spike in the price of oil, which rose from \$32 per barrel in 2003 to a peak of \$147 in mid-2008. Because of the particular way that oil prices are actually set – essentially the ‘spot’ or physical price is closely linked to the price of a paper barrel in the futures market¹³ – the increased financial flows into oil futures were seen by many as a

⁹ This kind of offsetting trade is necessary for NYMEX WTI Futures because physical delivery of oil is obligatory at the expiration of contract. In contrast, ICE Brent Oil futures contain an option for cash settlement rather than physical delivery.

¹⁰ For example, an oil producer might sell a futures contract for 1000 barrels per day for October 2020 at \$50 per barrel. When October arrives, the actual price of oil per barrel is compared to \$50, with the producer paying the counterparty (who bought the contract) the difference if the price is higher than \$50, or receiving the difference from the counterparty if the price is less than \$50. If the NYMEX price ends up as \$40 for October, then the producer will sell their physical oil for that lower price, but will also receive \$10 “on paper” from the counterparty to the hedge. The end result is the producer is paid the equivalent of \$50 per barrel.

¹¹ The theoretical possibility of delivery, however, is important – as this provides a link between prices in the futures market and those in the spot (physical) market. If a contract for delivery in October matures, for example, then the amount paid for this oil on delivery must be equal to the October spot price.

¹² Masters also claimed that speculators had stockpiled “via the futures market, the equivalent of 1.1 billion barrels of petroleum, effectively adding eight times as much oil to their own stockpile as the United States has added to the Strategic Petroleum Reserve over the last five years” (Masters 2008).

¹³ For most of the 20th century, oil was mostly traded using long-term contracts in which prices were set (or ‘administered’) by oil majors or large oil producing countries (see Fattouh 2011). With the establishment of the NYMEX WTI contract in 1983 (and the Brent oil contract in the same year), trade in oil increasingly shifted towards a market-based pricing system reliant on the futures market. As a leading energy industry expert puts it: “What must be recognised is that futures ... evolved in many cases from conduits providing access to physical supplies into platforms performing functions of price discovery and information processing. Spot prices are often influenced by the futures markets, with causality being reversed compared to what is implied by conventional wisdom. A trader buying a physical cargo of oil sometimes does not realise that they become an unwilling participant in the derivative markets through the reverse link between forward and spot prices. This means that the traditional distinction between the physical and derivative traders becomes fuzzy.” (Kaminski 2012, p.8)

key explanation for this dramatic rise in prices. Indeed, the US Congress was to launch an investigation of this relationship in 2008, which saw several Senate hearings and testimonies from a range of high profile industry experts. Importantly, over this period, oil sat at the centre of a broader boom in commodity prices with the nominal prices of metals increasing by 230%, the price of food doubling, and those of fertilizers increasing fourfold (Baffles and Haniotis 2010). For many poorer countries dependent on food and energy imports, these rising prices had profoundly negative implications.¹⁴

The large econometrics literature exploring the link between financialisation and the price of oil has mostly centered upon the issue of speculation, and is plagued by a range of methodological problems stemming from its neoclassical assumptions (see Adams et al 2020 and Fattouh 2013 for summaries of this literature). These problems include the conceptual categories used (e.g. how to separate ‘speculation’ from legitimate ‘risk management’)¹⁵, difficulties in differentiating economic actors (e.g. data that cannot distinguish between actors who are both speculators and producers at the same time)¹⁶, and issues of endogeneity (e.g. how to model expectations around the so-called ‘fundamentals’ of supply and demand, when these expectations effect both physical and financial traders).¹⁷ Largely as a result of these inherent methodological limitations, the mainstream economics literature is completely unsatisfactory. Indeed, one recent meta-study surveying the findings of 100 empirical studies concluded that the number of those where speculation was found to have a statistically positive impact on commodity markets was about equivalent to the number where it was found to have a statistically negative impact (Haase 2016)¹⁸.

Moving beyond the narrow focus on speculation – as Anna Zalík perceptively comments, *all* ‘[f]uture pricing is by definition speculative’ (Zalík, 2010, p. 554) – there is strong evidence that increased financial activity in commodity futures has a significant impact on price volatility in conjunction with other supply and demand factors (Nissanke 2012). There is an intuitive logic to this – following the deregulation of commodity markets the spot prices of most commodities became referenced to future prices, and today both producers and traders make decisions based upon these ‘benchmark’ prices (Ederer 2016, p.463). Indeed, in the case of oil, the price announced daily for WTI and Brent is a direct quote of what a ‘paper barrel’ costs on the futures market (not, as is widely but mistakenly thought, the actual price of a physical barrel of oil). In light of this, a large range of studies across different commodities and geographies have confirmed the ways in which price formation is now connected to the volume and volatility of financial activity in futures markets (Clapp and Helleiner 2012; Tang and Xiong 2012; Newman 2009; Bargawi and Newman 2017; Basak and Pavlova 2016; Ederer et al 2016; Startiz et al 2018).

In comparison to this extensive literature on the question of price dynamics – and echoing the critique made in the preceding section – the impact of financialisation on other moments of the commodity circuit remains relatively underexplored (McGill 2018;

¹⁴ Of course, for major commodity exporters, such as the Gulf Arab states, this price boom provided an enormous financial windfall that significantly impacted their place in global and regional economies (Hanieh 2018).

¹⁵ For a discussion of this issue, see McGill (2018), who notes: “It is ... extremely difficult to articulate a definition of speculation that is not in some way tautological or at least redundant.” (p.10).

¹⁶ As Jennifer Clapp has pointed out in relation to agricultural commodity markets, it is very difficult to distinguish between hedging or financial speculation undertaken by commodity trading firms (Clapp 2015).

¹⁷ A larger issue here is the mistaken assumption that prices *should* correspond to ‘fundamentals’ in the absence of speculation. As Marx himself noted, the price-form itself necessarily deviates from supply and demand in order to be adequate to “a mode of production whose laws can only assert themselves as blindly operating averages between constant irregularities” (Marx 1990, p.196). I am indebted to Demet Dinler for this observation.

¹⁸ The paper measured the impact of speculation on six variables: price, returns, risk, premiums, spreads, volatility, and spill-over.

Staritz et al 2018). There is, as Staritz et al (2018) note, a “perception of commodity derivatives as investment vehicles disconnected from physical markets and real-world processes of commodities production and trading.”¹⁹ Nonetheless, there is an emerging body of work that analyses how the financialisation of commodities has accentuated the power of large traders and financial firms – and weakened the position of labour – across the value chain. This can manifest itself in the subordination of smaller firms, frequently located in the Global South, to financial imperatives set by futures markets in the North. In this manner, financialisation not only squeezes conditions of labour across the entire value chain (Labban 2014), it can also widen class differentiation (Newman 2009) and expose smaller producers and traders to increased volatility and risk (Staritz et al 2018; Bargawi and Newman 2017; Isakson 2015). Furthermore, for countries that are heavily reliant upon particular commodity exports – as Zambia (Kesselring et al 2019) and Chile are with copper (Arboleda 2020) – financial markets can create significant pressures to restructure tax laws and weaken various social and environmental regulations.

There has been little examination of these broader issues in the literature on oil, which, as McGill (2018, p.647) notes, largely continues to treat financialisation as a purely financial phenomenon restricted to the futures market, rather than a process whose effects are deeply connected to the dynamics of production and trading. The one significant exception to this is the work of Mazan Labban (2010; 2014), whose understanding of financialisation pivots around the category of fictitious capital. For Labban, oil futures markets ultimately need to be understood as sites in which fictitious capitals – titles to future yet-to-be realized value – can be bought and sold.²⁰ With greater amounts of oil “traded in financial markets than in spot markets ... major oil companies have increasingly turned towards financial markets for shorter term returns on their investments” (2010, p.542). As a result, the financialisation of oil has transfigured how prices are formed, moving away from price determination based on the availability of physical supplies of oil towards prices that reflect the trading of fictitious capitals in financial markets (2010, p.547). There is thus no *direct* causal relation between the price of oil and levels of investment in the physical supply of oil. Importantly, however, Labban is at pains to stress that this does not mean that the effect of physical production and trading of oil has disappeared or is no longer important. Oil is traded in both physical and financial markets simultaneously (2010, p.547), and thus the ‘oil market’ is composed of two internally-related abstractions – “a physical commodity circulating in physical (and financial) markets and its representation as a financial asset [or fictitious capital, AH] circulating in financial (and physical) markets.” (2010, p.542). There is a different materiality and temporality encountered in both these markets, but they are linked and thus mutually-formed.

One of the significant features of this argument is that it avoids the dualism often encountered in debates around the financialisation of oil (or other commodities). The ‘fundamentals’ of oil *do matter* – i.e. levels of production, availability of supplies, downstream demand for oil products, infrastructure bottlenecks and so forth – but they do so in their mediation through financial markets and their effects on expectations

¹⁹ They also note that while Global Commodity Chain (GCC) and other related approaches have examined the role of lead firms in disciplining and extracting value across the value chain, this literature has “largely neglected the role of finance and financial markets in shaping the structure and functioning of commodity chains and the outcomes for different actors in commodity sectors” (p.2).

²⁰ For Labban, financial derivatives are a clear embodiment of fictitious capital – they have no intrinsic value but are instead tied to the difference “between the spot price of an underlying asset and an agreed-upon price at an expiration date specified in the contract” (p.545).

around future conditions (p.548).²¹ As Labban comments:

“Oil companies have not become purely financial outfits. Their profits may have derived increasingly from financial investments and larger portions of their income are likely to be expended on dividends to shareholders, stock buyback (partly to compensate management), and interest and debt reduction. But investment in production still occurs, except now it is ‘disciplined investment’, i.e. disciplined by the dictates of financial logic and centered on the creation of ‘ever-greater shareholder value’. Indeed, oil companies continue to invest in production and in the expansion of reserves precisely because their ‘capitalization’, their market value, based as it were on perception about their ability to generate profit, is tied to the profitability of oil ... Thus, even when profits seem to derive from financial markets and investment is disciplined by the dictates of finance, profits are fundamentally tied to the production and realization of value from the production and trade of physical oil, in order for wealth in the form of ‘financial claims on expected future earnings’ to materialize as profit. And this ultimately depends on the ability of oil to make the *salto mortale* [‘leap of faith’]²² in the market.” (p.550).

Labban’s observation here is a sharp reminder that processes of financialisation – ultimately a reflection of large quantities of surplus capital seeking valorisation in the form of IBC – cannot be separated from the moment of commodity production. In reality, both the financial and productive spheres comprise internally-related moments within the broader circuit of capital, $M - C \dots P \dots C' - M'$. Elsewhere, Labban comments, “financialization cannot emancipate accumulation from the production (and realization) of value and therefore it can only proceed alongside the extraction of value in the labour process, even when that is deferred to the future” (2014, p.478). As noted earlier, much of the mainstream discussion of financialisation – and not a small proportion of Marxist work – tends to ignore this crucial point and adopt a dualist framing of the financial and productive moments, with the financial sphere conceived as separate from, and in opposition to, so-called ‘real’ activities. There is, as Powell (2016) observes, a tendency within this wider literature to treat financial activities as “residual and speculative [which] unnecessarily dichotomizes the relationship between industry and finance”.

Bringing these insights together with the earlier discussion of IBC and finance capital, how might patterns of capital control and ownership – i.e. processes of class composition – reflect these interdependencies between the financialisation of oil and the wider oil commodity circuit? In the remainder of this paper, I attempt to answer this question through an empirical investigation of the US oil industry. To do so, firstly requires a closer look at the longer-term dynamics of the oil futures market, with the principal aim of understanding the activities that take place on this market and, most significantly, the key financial actors who are involved in the buying and selling of futures and options contracts. I then turn to examining the relations between these same financial actors and the production and circulation of oil (as value) through its circuit –

²¹ Indeed, one indication of this is the close attention that commodity traders on NYMEX pay towards ‘real world’ factors such as wars, supply-side restrictions, weather, and so forth.

²² Labban is referring here to the moment of realization of value, when the commodity is actually sold in the market place.

stretching from oilfield exploration, transport and storage, through to the sale of petroleum products and the generation of power.

4. The Financialisation of US Oil Markets

A key indicator of the financialisation of oil is the tremendous growth in the trade of oil futures and options, which provide a commitment to deliver a particular quantity and quality of crude oil at some specified point in the future.²³ These contracts are bought and sold on exchanges, the two most important of which are the New York Mercantile Exchange (NYMEX, for West Texas Intermediate oil) and the Inter-Continental Exchange (ICE, for Brent oil). These two exchanges are critical to the world oil market – as the prices of WTI and Brent are the two main global ‘benchmarks’ through which the prices of the myriad other kinds of crude oil from across the world are set and commensurated.²⁴

The discussion here will focus on the market for WTI, which is a light sweet crude produced from a large number of different oil fields in the US. Unlike sea-borne Brent, WTI crude is delivered by an extensive system of pipelines and rail to the land-locked destination of Cushing, Oklahoma.²⁵ Due to this arrangement, the price of WTI can be heavily impacted by transportation bottlenecks or limited storage capacity. WTI underlies the WTI Light Sweet Crude Oil futures and options contracts that have been listed since 1983 on the NYMEX (a division of the CME, Chicago Mercantile Exchange), one of the most liquid and deep financial markets in the world. NYMEX WTI contracts are dated for delivery by calendar month (for example, June 2021) and can be traded up to ten years in advance. WTI is the main oil benchmark for North America, with most of the oil produced, traded, and imported into the US priced at a differential to WTI.

One reflection of the sheer growth in the NYMEX WTI market over recent years is the prodigious expansion in the market’s average daily volume (ADV), which measures the average number of WTI contracts that exchange hands each day. Between 2007 and 2020, the ADV of WTI futures and options traded on NYMEX has more than doubled, from 0.485 to 1.1 million contracts (NYMEX/COMEX 2020 and 2008)²⁶. Each NYMEX contract represents 1000 barrels of oil, so the latter figure is equivalent to a daily trade of around 1.1 billion barrels of oil. Figures such as these received significant headlines during the commodity spike of 2003-2008, with some analysts pointing out that the ‘paper barrel’ trade was much higher than daily physical oil usage in the US – in 2020, around 70 times more paper barrels were traded each day than actually used – and that this provided strong evidence for excessive levels of speculation in the market.²⁷

While market volume is one indication of the high levels of liquidity and activity in NYMEX WTI, a more insightful measure is Open Interest (OI). Any contract in the

²³ A futures contract is an agreement to buy or sell oil at a certain price in the future. An options contract gives the holder the right (but not the obligation) to buy or sell on the specified date. In addition to the grade of oil, these contracts specify the volume, price, time period, and location where the oil should be delivered.

²⁴ Oil drawn from other locations is priced at a differential to these benchmarks. These price differentials are dependent upon various factors, including the physical differences of the oil (such as viscosity, sulphur content, density and so forth), the cost of transportation, and the demand for particular refined products.

²⁵ Known as the ‘the pipeline crossroads of the world’, the Cushing system is made up of 24 pipelines and 15 storage terminals. Over 13% of US oil is stored there, with an inbound and outbound capacity of 6.5 million barrels a day.

²⁶ NYMEX/COMEX Exchange ADV Report – Monthly Report.

²⁷ While such comparisons are attention grabbing they are nonetheless somewhat misleading. They do not account for the fact that futures contracts cover the delivery of oil over an entire month, not a single day, and that contracts of varying maturity are bought and sold in each day’s trading activity. Fundamentally, the problem here is a comparison between a stock (volume of contracts) and a flow (daily usage). For a discussion of these issues, see Ripple (2006).

futures market has two sides, a buyer and seller, and is referred to as ‘open’ until the contract either expires or the buyer takes an offset position (an opposite position in another contract to cancel out the first one). OI refers to the number of contracts that are open or active, i.e. the number of total contracts minus those that have been offset. Higher levels of open interest indicate that additional capital is entering the market, while decreasing levels of open interest shows that money is leaving the market – in this sense, OI is a more revealing metric than volume for financial involvement in WTI because it captures the quantities of *new* money that are flowing into oil futures and options.²⁸

OI data are reported by the Commodity Futures Trading Commission (CFTC), an independent US government agency that regulates futures markets such as the NYMEX WTI. Utilising the CFTC’s Commitment of Traders Report (CoT) – a weekly publication that records levels of OI across different categories of traders and commodities – Figures 1 and 2 present an analysis of Open Interest in the NYMEX WTI contract (futures and options) since 2000. The graphs confirms the very significant increase in the size of the oil futures market over this period, with total OI growing around 375% in the last two decades. Particularly rapid growth is noticeable between 2003 and 2008, coincident with the commodity price spike of that period. However, total OI has not dropped since that earlier spike, and figures for 2020 exceeded those of 2008 despite the significant impact of Covid-19 on global oil prices.

Figure 1: Open Interest in NYMEX WTI (futures and options) by Trader Category (2000-2020)

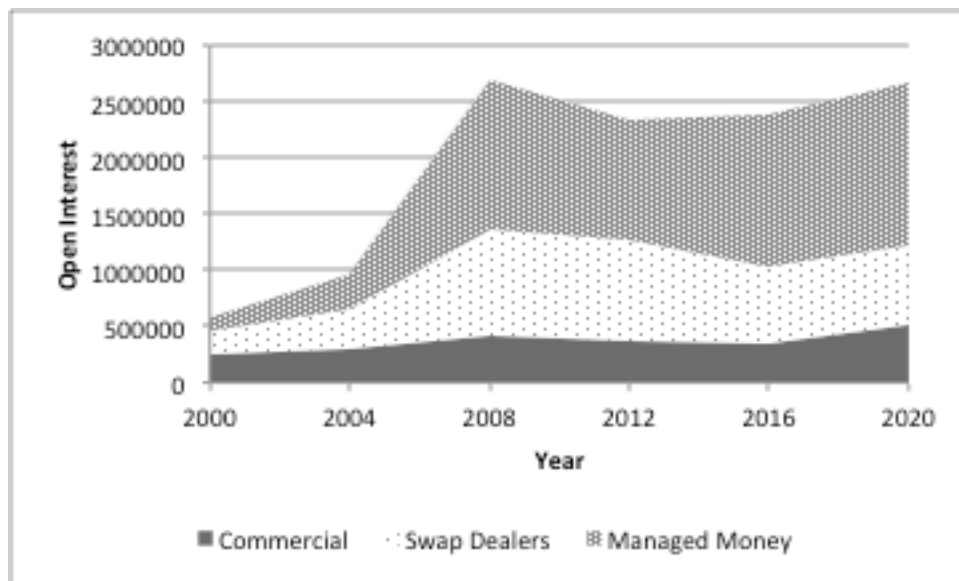
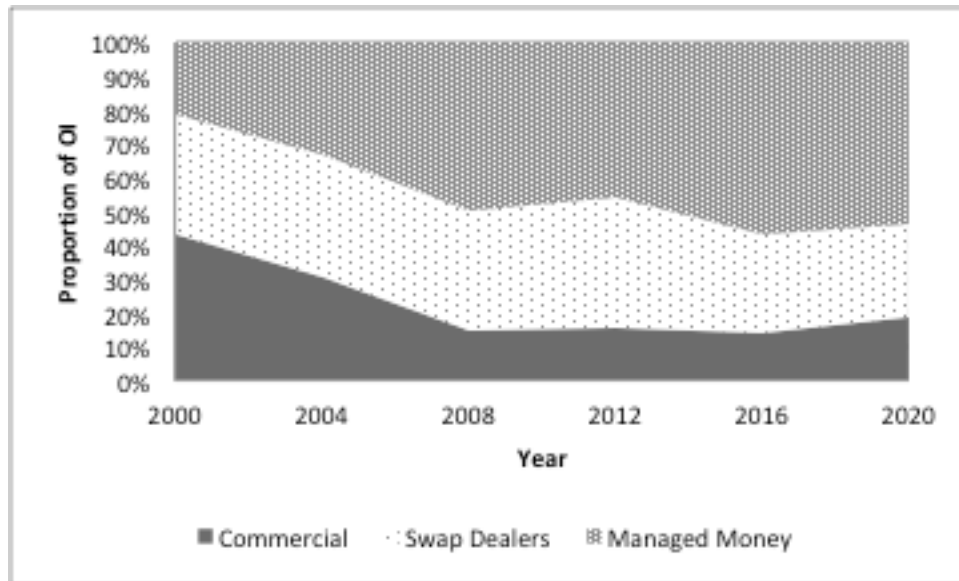


Figure 2: Proportion of OI in NYMEX WTI (futures and options) by Trader Category (2000-2020)

²⁸ For example, suppose trader A sells a contract to trader B, who, a few hours later, decides to close their position by selling the same contract on to trader C. The volume of this sequence would be 2 (two exchanges have taken place) but the OI would be one (only one contract is open).



Source: Büyüksahin (2008) for 2000-2008 figures; CFTC Weekly CoT Reports for subsequent years.

The CFTC’s CoT report divides OI into three main categories of market participants that are shown in Figures 1 and 2. The first of these are labelled *commercial* traders, firms that deal directly with physical oil, including producers (such as oil companies), oil traders (those who transport and store oil), and end-consumers of oil or oil products (such as oil refiners or airlines). Commercial traders use the futures and options market in order to hedge against any potential adverse movements in prices, and, through the 1980s and 1990s, they constituted the majority of participants in the oil market. Since that time, however, the proportion of OI involving commercial traders has dropped very significantly, from around 43% in 2000 to 18% in 2020.

The second type of market participants shown in Figures 1 and 2 are *swap dealers*.²⁹ Swap dealers are large financial institutions that earn fees through selling off-exchange derivatives contracts (so-called over-the-counter, or OTC, derivatives). The customers for these OTC derivatives may be commercial traders needing to hedge risks around oil price movements, or hedge funds and other kinds of speculative traders looking to invest in oil beyond the standardised contracts offered on the exchange. Because swap dealers are dealing in a large number of OTC derivatives with a variety of different positions, there can be a potential net risk to this activity.³⁰ In order to minimize this risk, swap dealers calculate the aggregate exposure on their off-exchange contracts and then buy or sell the equivalent (opposite) contracts on NYMEX in order to maintain a neutral position.³¹ This on-exchange activity is reflected in Figures 1 and 2, and in 2020 sat at

²⁹ Up until 2009, the CoT report included swap dealers in its figures for commercial traders. Many analysts claimed that this led to a massive overstatement of the commercial category and thus underplayed the impact of speculative activities on the oil price. Following widespread objection to this so-called ‘swap dealer loophole’, the CFTC began to differentiate these categories from 2009 onwards. For this reason, the data points for 2000-2008 are drawn from a table presented by Büyüksahin et al (2008) who had earlier access to granular data from the CFTC. The figures for subsequent years are calculated by the author from the weekly CoT.

³⁰ Swap dealers are financial intermediaries who attempt to match buyers and sellers as much as possible. They will sell derivatives that are both ‘long’ (i.e. sold with the expectation of an increase in price) or ‘short’ (sold with an expectation of a decrease in price). But if the number of long positions exceeds the number of short positions for a particular price (or vice versa) then the swap dealer may face a loss.

³¹ In other words, it is only the residual net amount left outstanding from the buying and selling of OTC derivatives that swap dealers need to balance through their trade on NYMEX. For this reason, the data in Figures 1 and 2 do not actually include the majority of swap dealer trade in oil futures (which takes place privately and off-exchange, and is not subject to CFTC reporting). The data thus significantly understate the overall level of swap dealer involvement in oil contracts.

around 30% of total OI. Since 2008, the leading swap dealers in the oil futures market have been three large US investment banks, JP Morgan Chase, Goldman Sachs, and Morgan Stanley (Masters and White 2008). In 2020, these three banks held commodity swaps with a total notional value of over \$340 billion between them, far more than any other US bank and making up around 70% of all commodity swaps held by the ten largest financial holding companies in the US.³²

The final category of traders shown in Figures 1 and 2 is *managed money*. As the name suggests, managed money encompasses those institutions that manage other people's money and invest in oil contracts with the hope of making a profit. i.e. institutions that are purely interested in the trade of 'paper barrels'. Managed money traders are now the dominant actors in NYMEX WTI, making up more than 50% of total OI in 2020 (up from 20% in 2000). A key reason for this significant growth is the emergence of managed funds – such as commodity index funds or Exchange Traded Funds (ETFs) – that are linked to specific commodity indices and allocate money in commodity futures depending on the movement of those indices.³³ Most commodity indexes are heavily skewed towards energy and crude oil in particular (oil, for example, makes up more than 43% of the leading commodity index, the S&P GSCI³⁴), and for this reason, the emergence of these funds has led to a significant increase in financial flows – mediated by managed money traders – into the NYMEX WTI market.

There are a large number of financial institutions involved in the managed money trade.³⁵ These include the same investment banks noted above, who, in addition to their role as swap dealers, offer “services to clients for hedging and speculative purposes, including commodity investment products [such as ETFs]... they have been also active as proprietary traders speculating on commodity prices on their own account” (Heumesser and Staritz 2013, p.23). It is difficult to provide a precise empirical estimation of the role of investment banks in these kind of activities, but Goldman Sachs, Morgan Stanley, and JP Morgan each reported that around 15% of their total trading revenues came from commodity derivatives in 2020 (much more than any other investment bank).³⁶ Alongside these investment banks, other prominent financial actors within the managed money category include hedge funds, private equity firms, and asset management companies – all of whom may trade oil contracts directly or manage investment funds on behalf of a pool of other investors. Some of these actors are also involved in 'volatility trading' – the buying and selling of options aimed at profiting from large movements in

³² These figures have been calculated by the author using FR Y-9C forms, consolidated financial statements that must be submitted by large financial holding companies to the US Federal Reserve each quarter. FR Y-9C forms are publically available from the Federal Financial Institutions Examination Council, <https://www.ffiec.gov/NPW>.

³³ These funds pool money from thousands of different investors and allocate this capital to particular investments depending on the movement of an underlying index. In the case of commodities, the most important of these indices is the S&P GSCI, which tracks 25 different commodities across the energy, metals, agriculture, and livestock sectors. A fund tracking the S&P GSCI would make investments into these 25 commodities according to a particular weighting that is periodically reviewed. The allocation of capital through these funds can be *passive*, in other words, the distribution of investments is automatically recalibrated depending on the movement of the underlying index; or it can be *active*, i.e. determined by fund managers who select investments based upon a variety of (often proprietary) factors. These funds can entail a high degree of risk and leverage, and the attempt to meliorate this risk is a further reason that fund managers are active within commodity derivative markets.

³⁴ Revealingly, this index was established in 1991 by Goldman Sachs as the Goldman Sachs Commodity Index. It was bought by Standard and Poor's in 2007 and renamed the S&P GSCI.

³⁵ The CFTC does not provide public information on the individual financial institutions that are involved in the swap dealing and managed money activities shown in Figures 1 and 2. However, it is possible to piece together some broad indications of who these institutions are through a variety of other sources, including academic studies, press and industry reports, the financial statements of banks and other firms, and the formal reporting requirements of large financial holding companies to the US Federal Reserve (e.g. the FR Y-9C form referred to in footnote 32).

³⁶ Calculated by author from annual financial statements. While these figures are for commodities in general, energy derivatives (mostly for crude oil) make up by far the largest component of total trade in global commodity derivatives (WFE 2019, p.3; p.33).

the price of oil.³⁷ Additionally, they may engage in buying and selling OTC derivatives linked to oil, and thus – as major counterparties to the swap dealers noted above – indirectly act to increase the overall OI on NYMEX.

Taken as a whole, the relative involvement of these three market participants – commercial, swap dealers, and managed money – indicates how much the oil futures market is driven by so-called non-commercial participants (managed money and swap dealers) who enter the market in order to trade (and hopefully profit from) the price movements of ‘paper barrels’. The data presented in Figures 1 and 2 confirm the considerable growth in the non-commercial categories over the last two decades, which together now represent more than 80% of total OI in oil. These trends are a striking indication of oil’s financialisation, i.e. *oil has become an object that is traded by financial institutions, within financial markets, and which is abstracted from its concrete use value as an essential element of all capitalist commodity production.*

Mapping Finance Capital across the Oil Commodity Circuit

It is evident that a diverse set of financial actors drives this growth of non-commercial activity in oil futures. These actors include large US investment banks as well as other kinds of financial institutions who combine asset management, hedge fund, and private equity activities. They may engage directly in the oil futures market for their own purposes, or trade on behalf of other clients to whom they offer hedging and investment services. The explosive growth in the oil futures market over recent decades reflects a market that has now become dominated by these financial actors; in this sense, the financialisation of oil appears as a phenomenon that has weakened the role and weight of traditional commercial actors – oil producers, refiners, traders and so forth.

What happens, however, if we reject the kind of commercial/non-commercial dichotomy implicitly adopted in most studies of the financialisation of oil (and in the CFTC data utilised in the preceding section), and consider the ways in which the large financial institutions driving the dynamics of the oil futures market are also simultaneously embedded within other moments of the oil commodity circuit? To this end, Table 1 (see appendix) examines nine US-based financial conglomerates that are leading components of the non-commercial Open Interest captured in Figures 1 and 2 above (i.e. acting as swap dealers or managed money). Clearly these nine firms are not the only financial actors active on NYMEX and other commodity markets, but they are the foremost firms of their kind in the world, and can be considered representative of the broader financial interests driving the growth in oil futures. Given this fact, Table 1 captures the involvement of these firms in the oil commodity circuit beyond financial markets – in other words, their direct participation in the actual production and realisation of oil-as-value, and their integral position as both beneficiaries and drivers of the ‘real-world’ carbon economy.

³⁷ Volatility traders employ a complex array of strategies that involve the simultaneous purchase of put and call options (see Schofield 2008). Profit depends on the magnitude and speed of changes in the price of oil contracts (in either direction) and not on the price itself and, for this reason, instability can become desirable and extremely lucrative (e.g. the rapid crash in the price of oil that occurred with the negative pricing of WTI in April 2020). Due to the significant risks involved its production and consumption (geopolitical, environmental and others), oil has an inherent volatility, and in 2007, the Chicago Board Option Exchange (CBOE) began publishing an index that measures oil volatility (the Crude Oil Volatility Index, OVX). Since that time, numerous ETFs have been launched that track the OVX. It is, however, difficult to determine the levels of volatility trading in oil from publically-available data, or to identify the precise actors involved in this kind of speculation. I am indebted to one of the anonymous reviewers of this paper for highlighting this important issue, which carries numerous intriguing implications in need of further study.

The conglomerates examined in the table encompass three broad groups of financial services. The first of these are *Asset Management Firms*, large financial firms that pool surplus capital from various sources (e.g. wealthy individuals, companies, pensions, or other institutions) and direct this into equities, bonds, or other investment instruments (including commodities such as oil). The three firms listed in Table 1 (Vanguard, Blackrock, and State Street) are the top-ranking asset management firms in the world and collectively control more than \$15 trillion in assets – around one-third of the total assets held by the top 20 asset management firms globally, and an amount exceeding China’s GDP in 2019 (TAI 2020, p.44). Usually referred to as the ‘Big Three’, these firms are also among the largest global managers of commodity index funds and Exchange Traded Funds – in 2020, ETFs issued by these three firms were estimated to hold more than 80% of total global ETF assets, including several directly tracking the movement of commodity futures such as WTI.³⁸

The second group of firms shown in Table 1 are the large *investment banks*, JP Morgan, Morgan Stanley, and Goldman Sachs. As noted, these well-known banks are major financial actors on NYMEX – as the leading swap dealers and also as money managers and investors in their own right. More generally, these banks offer a range of investment funds that may be passive or actively managed, and which track a diverse range of equities and bonds across different sectors, indexes and geographies. In addition to these kinds of portfolio investments, investment banks offer a range of financial services to corporate, individual and government clients. They also typically have specialised units for private equity, venture capital, or other kinds of direct investment into infrastructure, real estate, or private firms.

The final institutions shown in Table 1 are the three *Hedge Funds/Private Equity firms*, Blackstone Group, Carlyle Group, and Riverstone Holdings. As with asset management firms and investment banks, these firms have been central actors driving the financialisation of oil through their managed money activities on NYMEX futures. Indeed, many studies of oil futures markets simply describe the non-commercial category of traders (misleadingly) as ‘hedge funds’. In addition to their hedge fund activities, the three firms listed in the table control major private equity funds that invest in private (non-listed) firms with the goal of maximising short-term return – often obtained through taking on high levels of debt and using the target company’s assets as collateral. Blackstone and Carlyle are the two largest PE firms in the world, controlling \$545 billion and \$223 billion of assets in 2020 respectively, while Riverstone Holdings runs an energy-focused PE fund with \$41 billion in assets.

The data in Table 1 (collated in late 2020) must be situated in the context of a massive boom in US oil production that took place between 2009 and 2014. With the steady rise in world oil prices over this period, the development of so-called ‘non-conventional’ oil and gas supplies – reserves that are difficult and more expensive to extract than conventional fossil fuels – were strongly incentivised. Of particular relevance here is US shale, crude oil and gas held in shale or sandstone of low permeability that is extracted through fracturing the rock by pressurised liquid (hence the term ‘fracking’). High global oil prices drove large investments into shale field development between 2009 and 2014, which led to significant improvement in extraction technologies for these non-conventional supplies. This shale boom was also closely connected to the deepening financialisation of the US economy following the 2008-2009 global financial crash, with

³⁸ <https://www.etf.com/sections/etf-league-tables/etf-league-table-2020-12-15>

the pools of surplus capital generated by policy responses to the crisis seeking valorisation in the fracking industry as IBC.³⁹ The net result was a major increase in US domestic oil production, which tripled between 2009 and 2014, and propelled the United States into the top rank of oil producers globally. Remarkably, the US became a net exporter of oil in early 2011, and overtook Saudi Arabia to become the world's largest producer in 2013.

Given this boom in US oil production, how are the nine financial conglomerates shown in Table 1 embedded in the wider commodity circuit – specifically through the ownership and control of firms involved in development of hydrocarbon reserves, as well as further mid- and downstream activities? In this respect, Table 1 reveals these conglomerates' deep involvement with over 160 leading US energy-related firms active across the entire energy value chain: the exploration and production of oil and gas; pipelines, transportation and storage; oil and gas services (e.g. drilling, equipment, and maintenance); refining and processing of oil and gas; and the generation and transmission of power.⁴⁰ The firms analysed in Table 1 include the top publically listed energy companies on US stock markets, as well as more than 100 energy-related firms that are privately owned. These companies are primarily active in the US and Canada, although, as we shall see, many also have significant international interests.

Turning first to the public investments shown in the table (i.e. portfolio investments in companies that are listed on the stock exchange). Here, it should be noted that only ownership stakes ranked within the top 10 shareholders of each company are recorded – for this reason, the real extent of conglomerate holdings is actually much broader than indicated. In regard to these publically-listed companies, the most striking feature is the tremendous reach of the Big Three asset management firms, which take the top three shareholder positions for around one-third of all the public companies mentioned in the table, including three of the world's largest integrated oil and gas companies: ExxonMobil, Chevron, and ConocoPhillips. In addition, the Big Three hold the top shareholder spots for the largest shale producer in the US (Pioneer Natural Resources), the three largest independent oil refiners (Marathon Petroleum, Valero Energy, and Philipps66), the country's largest natural gas network (Kinder Morgan), and the top five US electric utilities (Nextera; Dominion; Duke; Southern; and American Electric). The dominant presence of the Big Three throughout these listed firms has led some analysts to identify them as major culprits in climate change – one study has found that the Big Three control over 11 Gigatonnes of CO₂ in oil and gas reserves through their portfolio holdings, equivalent to around one-third of the total energy-related CO₂ emissions globally in 2018 (InfluenceMap 2018, p.22).⁴¹

Alongside the Big Three, the other conglomerates shown in Table 1 also hold significant portfolio stakes in companies across the oil commodity circuit. These holdings span the entire oil value chain, including production and exploration activities, the operation of pipelines and transport, storage, processing, and power generation. In most cases these

³⁹ These policies include Quantitative Easing and the on-going maintenance of ultra-low interest rates. A significant proportion of the IBC directed into the shale industry through this time came in the form of debt and equity investments made by private equity firms (and, indirectly, through pension funds that invested in PE because they were unable to generate satisfactory returns on fixed-income instruments). This produced a highly-leveraged industry that was heavily dependent upon continued inflows of IBC. Indeed, North American shale firms involved in the exploration and production experienced a four-fold increase in net debt between 2005 and 2015 (\$50 billion in 2005 to nearly \$200 billion), and one estimate claims that PE-backed firms were responsible for one-third of all US shale drilling (McLean 2018). The subsequent collapse in oil prices drove many of these heavily indebted firms into bankruptcy, and led to a wave of industry consolidation between 2016 and 2018.

⁴⁰ The companies represented in Table 1 also include firms involved in natural gas due to the fact that most oil companies have interests in gas (and vice-versa). It is impossible to separate these two components of the energy industry for analytical purposes.

⁴¹ When coal is added to these figures, the amount of CO₂ equivalent rises to 20.27 GTonnes.

are minority portfolio investments, although some of the investments held by PE firms constitute direct control (such as Carlyle and Riverstone's joint 74% ownership of Liberty Oilfield Services, the second-largest fracking provider in North America). Over the last decade, there have been numerous examples of interlocking directorships and other close management relationships between the conglomerates listed in Table 1 and the energy-related firms in which they are invested.⁴²

It is important not to mistake the (mostly) minority portfolio investments shown in the table as implying a lack of influence over long-term firm strategy or governance. The conglomerates examined in Table 1 control a significant proportion of overall voting power within shareholder structures, which typically exceeds that of any other bloc of shareholders (Bebchuk and Hirst 2019; Fichtner et al 2017). While this does not characteristically translate into direct day-to-day management control, it does provide substantial voice inside the firm, including around the election of director positions, and has helped consolidate long-term institutional relationships between these nine conglomerates and the energy-related firms examined in the table. In addition to interlocking directorships, these relationships can be seen in the many cases of executives who have moved between the boards of these firms.⁴³ Direct influence is also demonstrated by the persistent role of these conglomerates in shaping the content of shareholder discussions – including, most pertinently, by actively blocking attempts of climate change activists to pass resolutions around emissions targets or tighter environmental regulations (Greenfield 2019). Indeed, the owners and management of these conglomerates openly expect that major strategic priorities should be developed in dialogue with them (Fichtner et al 2017). As JP Morgan bluntly expresses it in a recent prospectus presented to the New Mexico State Investment Council, the boards of energy-related companies in which they invest “are an *extension* of the [JP Morgan] Infrastructure Investments Group.” (JP Morgan 2019, p.29, italics added).

The direct involvement of these conglomerates in the oil commodity circuit is even more apparent through their ownership of the 100+ privately-owned energy-related firms that are also listed in the table. It should be emphasised that the information presented in the table is in no way fully representative of these private energy-related investments. Unlike portfolio investments, there is no necessary public disclosure of this information, and the government filings presented by these firms do not provide adequate granular detail. Indeed, there are numerous examples where investments in large oil firms go unmentioned in annual reports or little useful detail is provided.⁴⁴ This problem is compounded by the fact that ownership over these assets is often exercised through conglomerate subsidiaries or special purpose vehicles domiciled in offshore jurisdictions. As a result, the information presented in the table is necessarily partial, and has been pieced together through a variety of sources, including press and government reports, financial statements, and cross-industry studies.⁴⁵

⁴² Such as Chevron (Goldman Sachs; JP Morgan; Carlyle Group; Riverstone Holdings), ExxonMobil (JP Morgan; Goldman Sachs; Carlyle Group), BP (Goldman Sachs; Blackrock, Riverstone); Kinder Morgan (Goldman Sachs; Carlyle; Riverstone Holdings), and Duke Energy (Riverstone Holdings; Carlyle, Morgan Stanley).

⁴³ See littlesis.org, a research site that maps corporate and political interlocks, for examples of these relationships.

⁴⁴ One example here is Morgan Stanley's 2012 acquisition of Transmontaigne, an oil pipeline and terminal company. Transmontaigne was the 17th largest private company in the US at the time of purchase, but Morgan Stanley's annual reports gave no substantive details of ownership (Public Citizen 2014, p.10).

⁴⁵ Interestingly, one of the most useful sources of information are the various fund ‘pitches’ made by these financial conglomerates to local or municipal governments in the US. These are typically confidential at the time of presentation, but are later published as part of meeting minutes. They often include a detailed breakdown of fund holdings.

Due to the Big Three's principal emphasis on portfolio investments, these firms are less visible in the ownership of private firms – although it should be noted that Vanguard has recently launched its first private equity fund (in February 2020), a move that could significantly alter the firm's ownership of non-listed companies. In contrast, however, the extensive reach of the three investment banks – JP Morgan, Goldman Sachs, and Morgan Stanley – in privately-owned energy firms is clearly evident from the table. These banks first became involved in the ownership, transport, and storage of commodities following the deregulation of commodity markets in the early 2000s; a business that proved extremely profitable through the extended run in commodity prices between 2003 and 2008 (Omarova 2013). After the global financial crash of 2008, they sought to expand their participation in physical commodities through acquiring the distressed assets of other failing firms (Omarova 2013).⁴⁶ Today, one striking indication of their direct role in the trade of oil, gas, and metals is the collective value of their inventories of *physical* commodities, which rose from \$8.9 billion in 2015 to over \$21 billion in 2020.⁴⁷

For these investment banks, the ownership interests shown in the table are typically exercised through funds that take majority control of private energy-related firms and directly participate in their management. By late 2019, for example, JP Morgan was reporting that just a single one of its energy-related funds controlled 464 assets across 25 countries. These assets include the second largest gas distribution company in Spain, at least eight gas-fired utility plants supplying millions of customers across Arizona, California, New Mexico and Colorado, and 50% control over a North Sea firm supplying around one-fifth of the UK's daily natural gas needs (JP Morgan 2019, p.10). Goldman Sachs and Morgan Stanley are similarly deeply involved in the oil commodity circuit, with interests that include the production and transport of oil and gas, oilfield services, and power generation.

Likewise, PE firms hold major stakes in the private companies listed in the table. Blackstone, for example, revealed in 2018 that half of its energy investments are in upstream oil and gas – including shale, fracking, and offshore production – with the company controlling oil reserves across the US, Canada, Europe and Africa (Blackstone 2018, p.8). Blackstone is the second biggest shareholder in Cheniere Energy, the largest producer of liquefied natural gas in the US, and Cheniere and Blackstone jointly own and operate Sabine Pass LNG Terminal, the largest export terminal of its kind in the US.⁴⁸ Carlyle is also – in essence, if not in name – a global oil company, with direct involvement in the exploration and production of oil and gas reserves across the US, Spain, Egypt, Gabon, Colombia, India, Netherlands, Germany, New Zealand and elsewhere. Similarly, the energy-focused Riverstone Holdings has extensive ownership of assets in upstream oil production, oil field services, as well as the tanker and terminal business.

Taken as a whole, the information presented in Table 1 demonstrates the remarkable degree to which control over the oil commodity circuit is concentrated and centralised in

⁴⁶ In 2008, for example, JP Morgan acquired the commodities arm of its failed rival, Bear Stearns, followed in 2009 by the purchase of Commodities Canada, a UBS-owned company that expanded the firm's global commodities business Canadian gas, crude oil, and power. In 2010, JP Morgan went on to buy RBS Sempra Commodities from the Royal Bank of Scotland, giving it access to 30 million barrels of crude oil storage capacity, control over a massive global business involved in the trade of oil, gas, metals, and coal, and ownership of one of the world's largest network of commodity warehouses.

⁴⁷ Figures calculated from 'Gross fair value of physical commodities held in inventory' line 9a(2) of FR Y-9C form (see footnote 32). It should be noted there is a complex legal argument around this ownership of physical commodities. See Conlon (2018) for a good legal overview.

⁴⁸ Blackstone is also heavily involved in developing and operating oil and gas pipelines, including through ownership of Energy Transfer Partners, which controls the heavily protested Dakota Access Pipeline.

the hands of *the same conglomerates that are also driving the wider financialisation of oil*. These conglomerates clearly align with Marxist conceptions of finance capital, i.e. large firms with ownership interests that knit together and dominate different moments of the circuit of capital, including financial, industrial, and circulatory activities. For the vast majority of the 160+ firms analysed in Table 1 – firms that for all essential purposes *are* the energy industry in the US – capital ownership and control is overwhelming dominated by one or more of the finance capital conglomerates examined in the table. It is almost impossible to identify any US energy-related firm in which these conglomerates do not have significant ownership interests. Even in segments of the oil industry that are typically viewed as small scale ‘mom-and-pop’ businesses – such as the individual low-producing stripper wells that are the basis of extraction across many US oil fields – the vast majority of assets are in reality owned by large financial conglomerates such as those examined in Table 1.

Moreover, the dominant power of these conglomerates is not exercised solely at the level of individual firms. Table 1 reveals the significant extent to which finance capital superintends the *entire* oil value-chain – from the exploration and extraction of hydrocarbons, through the transport and storage of oil and gas, and the eventual transformation of these commodities into energy or other forms of circulating constant capital. The pronounced vertical and horizontal integration revealed in Table 1 has very important implications for how these conglomerates actually extract profit across the value-chain – providing, for example, opportunities to influence market prices through controlling the flow and storage of commodities, or gaining access to market information that is not available to other firms involved in the sector. These opportunities are not simply hypothetical – they have been repeatedly illustrated in practice.⁴⁹

Conclusion

The financialisation of oil over the past two decades has been driven by a variety of different actors, including investment banks, asset and wealth management firms, hedge funds, large institutional investors, and so forth. These firms might carry different labels, but in essence, each embodies the same general *function* within the overall circuit of capital: the pooling of ‘hoards’ of surplus capital, and the redirection of this capital (which takes the form of IBC) into various economic sectors, with the goal of obtaining a claim on future streams of value. The financialisation of oil is – as Labban and others have correctly pointed out – a reflection of the spectacular growth in the volume of these fictitious capitals. The enormous gap that has opened up between non-commercial and commercial Open Interest (Figures 1 and 2) is a key indicator of this process, which ultimately reflects the power of a handful of large financial conglomerates within the oil

⁴⁹ See Omarova 2013 for a detailed discussion of this point in relation to investment banks. A 2014 US Senate Hearing found that: “Morgan Stanley’s oil storage and transport activities gave it access to information about oil shipments, storage fill rates, and pipeline breakdowns. That information was available not only with respect to its own activities, but also for clients using its storage and pipeline facilities. . . . JPMorgan’s power plants gave it insights into electricity costs, congestion areas, and power plant capabilities and shutdowns, all of which could be used to advantage in trading activities. In each instance, non-public market intelligence about physical commodity activities provided an opportunity for the financial holding company to use the information to benefit its financial trading activities.” Outside of oil, in 2010 it was estimated that Goldman Sachs and JPMorgan controlled half the storage capacity at the world’s largest metal exchange, London Metals Exchange. Control over this storage while simultaneously trading those very same commodities gave these banks immense influence over commodity prices. In one infamous case, Goldman Sachs was accused by a US Senate investigation of manipulating the price of aluminium by deliberately creating bottlenecks in the transport of the metal from its warehouses. They would do this by paying metal owners to aimlessly shuttle metal between warehouses – sometimes just across the street, or from one building to another and back again – without actually moving the metal out of the storage system. According to a 2014 US Senate investigation, these ‘merry-go-round deals’ massively lengthened delivery times and thereby increased the price of metals traded by Goldman Sachs. Goldman Sachs denied the accusations, but in 2016 the subsidiary involved in the alleged scam agreed to pay \$10 million to the London Metal Exchange “without admitting or denying any alleged breaches of the exchange’s rules” (Sanderson 2016).

futures market and the subsumption of real world oil prices and production dynamics to the aspirant (but ever-uncertain) valorisation of IBC.

This process of financialisation, however, should not be read through a dichotomous understanding of the financial and non-financial spheres. Here, following Marx, we need to insist on the fetish character of IBC – a moment of surplus accumulation that seemingly originates through the simple exchange of money between different money-capitalists, but in reality is founded upon the actual production of value in the labour-capital relation. The financialisation of oil appears in a similar manner – as a process driven by financial actors, neatly contained within a distinct financial sphere, and arrayed against the supposed real-world production of oil (hence the language of ‘commercial versus non-commercial’ or ‘speculators vs. fundamentals’). But, in actuality, this *form of appearance is a mystification*. Rather than the supposed marginalisation of other moments of the oil commodity circuit, the huge volumes of IBC at play in the futures markets really express the ever-more tightly imbricated connections between finance, on one hand, and the production and circulation of oil as a physical commodity, on the other. These other moments of the commodity circuit have become more, not less, important as a consequence of oil’s financialisation.

As demonstrated above, these deepening interdependencies of oil’s financial, productive, and circulatory moments have significant implications for class composition and patterns of capital ownership and control. The drawing together of the different moments of the oil commodity circuit is reflected in the growing hegemony of a class of finance capitalists, which now dominates both the oil futures markets as well as the ownership of energy-related firms. These are not simply financiers or bankers, and their ownership interests cannot be reduced solely to forms of rentierism or financial parasitism. Rather, this is a class whose accumulation is deeply and directly aligned with the actual production and circulation of the oil commodity; a class that represents – following the understanding of finance capital articulated above – the tendential combination of the money, productive, and commodity circuits within single ownership structures.

In this respect, when thinking about *how* accumulation takes place in the oil industry – who directs the production and realisation of value, who draws surplus value from the various transformations of the oil commodity through each step of its circulation – it is not enough to focus simply on the large oil majors. While firms such as ExxonMobil, BP, and Chevron appear to be driving the physical extraction and refining of oil and oil-products, we should be careful not to mistake the institutional forms of appearance of the oil industry for its actual content. Ultimately, the dynamics of oil production are closely tied to the accumulation imperatives of the large finance capital groups examined throughout this paper – a class that acts simultaneously in both the futures markets and the day-to-day ‘real world’ of energy production, processing, and circulation. This class of finance capital is – in effect – a leading beneficiary of the carbon economy.

The discussion above has largely focused on the US oil industry and the NYMEX WTI futures market. Further empirical work is needed into the dynamics of class and capital accumulation in other oil markets and how these might replicate or diverge from the US experience. This includes Europe, where several large oil companies (e.g. BP, Shell, and Total) are based and where the other major oil benchmark (Brent) is traded. It also includes the Middle East, home to the world’s most important oil reserves and where massive oil firms (state and privately-owned) are active across the entire oil commodity circuit (Hanieh 2011; 2018). This kind of empirical research is all the more essential not

simply because oil underpins the entire system of capitalist commodity production – oil derivatives are also a critical but understudied feature of global financial power, and future geopolitical trajectories will be in part determined by control over oil *as a financial asset* and its role in underpinning forms of world money (see Hanieh 2022). It is noteworthy, for example, that the trade of energy derivatives across Asia, Europe and the Middle East has grown immensely in recent years – and now far exceeds US financial markets such as NYMEX⁵⁰ – and that China is investing considerable effort in promoting a new global oil benchmark through its Shanghai futures market (Hanieh 2022).

Moreover, the analysis offered above has clear implications for halting and reversing the catastrophic consequences of anthropogenic climate change. While it is a welcome development to see recent campaigns that variously target asset managers or private equity firms in the production of fossil fuels (InfluenceMap 2018; Greenfield 2019), these kinds of financial investors are typically approached as some kind of incongruous excrescence within the oil industry – firms whose proper business is outside the dirty world of oil, and who should be susceptible to reasoned shareholder pressure. The foregoing discussion, however, indicates the problems with this perspective: oil is as much a financial business as it is a physical commodity, and these co-constituted spheres of finance and production are superintended by a class of finance capital that is structurally located throughout all moments of the oil circuit.

Of course, it goes without saying that this class is not simply in the business of oil – these same finance capitalists are likewise embedded at the core of all sectors of capital accumulation today. In this sense, the structures of class power that characterise the oil commodity chain – from the oil field to the futures markets – are not an anomaly within the wider capitalist economy. Despite the fact that oil’s importance far outranks that of any other commodity, the tempo and rhythm of its valorisation is structured by the same set of social relations – and thus the same forms of class power – as that of every other product of capitalist society. This *ordinariness* of oil is crucial to emphasise, as it shows that the problem *of* oil is not a problem *with* oil – but rather one that demands far-reaching and systemic change.

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⁵⁰ Commodity futures are the world’s most actively traded derivatives, making up around 20% of all derivatives traded globally in 2019, a proportion exceeding equity, currency, and interest rate derivatives (WFE 2020, p.9). In 2019, energy derivatives (mostly for crude oil) accounted for more than 45% of the total global commodity derivatives trade (WFE 2020, p.3; p.33), and the Asia-Pacific, Europe and Middle East made up around 68% of this amount (WFE 2020, p.34).

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Annex

Table 1: Conglomerate Ownership Across Oil Commodity Circuit (US)

FINANCIAL CONGLOMERATE	OWNERSHIP OF ENERGY-RELATED FIRMS
Goldman Sachs	<p>PUBLIC: EOG Resources (0.32%); Enterprise Products Partners (1.91%); Energy Transfer(2.17%); Plains All American Pipeline (3.37%); Oneok (1.24%); Cheniere Energy (2.86%); Magellan Midstream Partners (3.83%); MPLX (1.95%); Targa Resources (3.59%); TC Pipelines (2.9%); Nustar Energy (2.01%); DCP Midstream (0.84%); Sunoco (4.6%); PBF Logistics (2.84%); Crestwood Equity Partners (1.83%); CrossAmerica Partners (0.79%); Enable Midstream Partners (0.22%); Shell Midstream Partners (1.08%); Delek Logistics (0.81%) PRIVATE: HES International (one of Europe's largest bulk handlers of oil and petroleum products); Lucid II (leading independent gas gathering and processing business in the northern Delaware Basin); BJ Services (leading provider of hydraulic fracturing);PSS Industrial (oil field services company); Mountaineer NGL Storage (underground natural gas storage)</p>
Morgan Stanley	<p>PUBLIC: Diamondback Energy (1.43%); Enterprise Products Partners (0.82%); Energy Transfer (1.0%); Plains All American Pipeline (1.44%); Marathon Petroleum (1.85%); Magellan Midstream Partners (2.65%); MPLX (0.85%); Nustar Energy (3.74%); Enviva Partners (1.62%); DCP Midstream (0.83%); Sunoco (2.36%); PBF Logistics (0.96%); Western Midstream Partners (1.04%); Enable Midstream Partners (0.71%); Shell Midstream Partners (1.17%); BP Midstream (6.58%); PRIVATE: Catalyst Energy Services (oilfield services); Mission Creek (largest oil producer in Arkansas); Presidio Petroleum; Specialised Desanders (oilfield services); Durango Midstream (oil and gas services); MG Bryan (oil equipment); XRI Blue (oilfield services); Sterling (oilfield services); Triana Energy (gas exploration and production); Bayonne Energy (Power plant in New Jersey); Brazos (midstream services); Red Oak Power (Power plant); Ital gas storage; Ashoka Gas (gas distribution India); Templar Energy (oil and gas exploration)</p>
JP Morgan	<p>PUBLIC: Chevron (1.26%); Diamondback Energy (7.19%); Pioneer Natural Resources (3.00%); Cononco Phillips (2.73%); Phillips66(1.6%); Plains All American Pipeline (2.33%); Marathon Petroleum (1.76%); Kindermorgan (1.19%); MPLX (0.77%); Equitrans Midstream (3.95%); TC Pipelines (3.05%); Nustar Energy (3.9%); Nextera Energy(1.9%); Xcel Energy (6.82%); DCP Midstream (1.48%); PBF Logistics (1.66%); Western Midstream Partners (0.99%); Crestwood Equity Partners (0.95%); Enable Midstream Partners (0.59%); Genesis Energy (9.34%); Genesis Energy (3.65%); Shell Midstream Partners (1.66%); Noble Midstream Partners (1.29%); BP Midstream (4.52%); Delek Logistics (0.64%). PRIVATE: Blackwater Midstream Corporation; Electricity Northwest; Nortegas Energia Distribucion; Sonnedix Power Holdings; Southwest Generation (gas-fired power plants)</p>
Vanguard	<p>PUBLIC: Chevron (8.5%); Phillips66 (10.17%); EOG Resources (7.45%); Pioneer Natural Resoueces (11.17%); Occidental Petroleum (9.99%); DiamondBack Energy (11.11%); BP (2.31%); Exxon Mobil (8.35%); ConnocoPhillips (8.41%); Abraxas Petroleum (3.41%); Adams Reseources & Energy (2.42%); Apache (8.9%); Valero Energy (10.08%); Canadian Natural Resources Limited (3.16%); Enbridge (3.28%); Marathon Petroleum(9.95%); Suncor (3.23%); KinderMorgan (7.47%); Oneok (11.53%); Holly Frontier (10.24%); The Williams Companies (9.14%); Cheniere Energy (8.47%); Southwestern Energy (11.15%); Worldfuel Services (8.97%); TC Energy (3.29%); PBF Energy (6.39%)' Ovintiv (9.31%); Schlumberger (8.12%); Targa Resources (9.54%); Equitrans Midstream (8.83%); Antero Midstream (6.09%); Halliburton (11.26%); Nextera Energy (8.59%); Southern Company (8.62%); Duke Energy (8.49%); American Electric Power (8.98%); NRG Energy (11.38%); Xcel Energy (9.13%); Edison International (11.42%); Dominion Energy (8.59%); Seacor Marine Holdings (4.81%); Talos Energy (2.16%); Centennial Resources (2.9%)</p>

State Street	PUBLIC: Chevron (6.35%);Phillips66(5.82%); EOG Resources (5.49%); DiamondBack Energy (6.80%); Occidental Petroleum (5.46%); Pioneer Natural Resoueces 5.97%); BP (1.88%); Exxon Mobil (4.80%); ConnocoPhillips (5.12%); Apache (5.72%); Valero Energy (5.90%); Marathon Petroleum (5.57%); Kindermorgan (4.85%); Oneok (5.5%); Holly Frontier (6.88%); The Williams Companies (5.46%); Cheniere Energy (2.24%); Southwestern Energy (5.83%); Worldfuel Services (3.82%); PBF Energy (7.4%); Marathon Oil (6.54%); Ovintiv (4.01%); Schlumberger (5.45%); Antero Midstream (1.42%); Halliburton(5.3%); Nextera Energy (5.21%); Southern Company (5.12%); Duke Energy (5.22%); American Electric Power (5.08%); NRG Energy (5.35%); Xcel Energy (5.32%); Edison International (7.27%); Dominion Energy (5.36%)
BlackRock	PUBLIC: Chevron (6.98%); Phillips66 (6.96%); EOG Resources (4.53%); Pioneer Natural Resources (9.79%); Occidental Petroleum 5.80%); DiamondBack Energy (5.17%), BP (6.8%); Exxon Mobil (6.7%); ConnocPhillips (8.05%); Abraxas Petroleum (2.00%); Adams Reseources & Energy (3.7%); Apache (6.08%); Enterprise Products Partners (0.77%); Valero Energy (8.51%); Marathon Petroleum (11.27%); KinderMorgan (6.7%); Oneok (8.77%); Holly Frontier(7.03%); The Williams Companies (9.45%); Cheniere Energy(5.93%); Southwestern Energy (15.18%); Worldfuel Services (10.3%); PBFEnergy (14.12%); Marathon Oil (6.47%); Ovintiv (7.24%); Schlumberger (6.7%); Targa Resources (4.9%); Equitrans Midstream (8.05%); Antero Midstream (5.05%); Halliburton (6.71%); Nextera Energy (5.17%); Southern Company (7.0%); Duke Energy (7.01%); American Electric Power (7.04%); NRG Energy (7.19%); Xcel Energy (9.02%); Edison International (9.08%); Dominion Energy (7.22%); Seacor Marine Holdings (2.08%); Talos Energy (4.89%); Centennial Resources (1.45%). PRIVATE: Kellas Midstream (gas pipeline firm in North Sea); Vopak Industrial Infrastructure Americas (chemical storage); Medgaz gas pipeline; Los Ramones (pipelines in Mexico); ADNOC oil pipelines (Abu Dhabi, UAE)
Blackstone Group	PUBLIC: Cheniere Energy (3.35%); Enterprise Prodcuts Partners (3.21%); MPLX (6.43%); Energy Transfer (5.37%); The Williams Companies (2.56%); Magellan Midstream Partnrs (4.43%); Pembina Pipeline Corporation (2.54%); Plains All American Pipeline (4.56%); Targa Resources (4.54%); Equitrans Midstream (3.10%); Antero Midstream (3.48%); TC Pipelines (4.15%); Nustar Energy (1.8%); Noble Midstream Partners (1.62%). PRIVATE: Eagleclaw Midstream; Siccar Point Energy (North Sea oil and gas fields); PDC Energy (gas facilities in Delaware Basin); Waterfiled Midstream (water management for fracking companies); Beacon Offshore Energy (Deepwater oil and gas, Gulf of Mexico); Rover Pipeline (pipeline across West Virginia, Eastern Ohio, Western Pennsylvania and Canada.); Tallgras Pipelines (pipelines across Wyoming and Kansas to Cushing); Gavilan Resources (shale company); Energy Alloys (oil and gas services); Flacon Minerals (Oil wells); Ultrerra Drilling Technologies; Targa Badlands (pipelines); Mime Petroleum; Vine Oil & Gas; Guidon Energy (shale field development); Osum Oil Sands Corp (oil sands in Canada); GridLiance (electricity transmission); Kosmos Energy (oil and gas Africa); Sabine Pass LNG.
Carlyle Group	PUBLIC: Seacor Marine Holdings (4.9%); Liberty Oil Fields (37.27%); Talos Energy (6.79%). PRIVATE: Compañía Española de Petróleos (Spanish oil exploration and production); Altus Midstream (natural gas processing and transmission); Emera New England Gas-Fired Generation Facilities (power plants); Crimson Midstream (oil transportation); Lone Star Ports (oil terminal developer); Neptune Energy (Egypt); Assala Energy (second largest oil producer in Gabon); COG Energy (Colombia oil producer); Elgin Energy Center (power generation); LS Power (power generation); Black Sea Oil & Gas (offshore service);Magna Energy (oil and gas, India); Clearly Petroleum; Hilcorp Energy Development; Altus Midstream; NGP Energy; Philadelphia Energy; Discover Exploration (O&G fields in Netherlands, Germany, New Zealand, Comoros)
Riverstone Holdings	PUBLIC: Liberty Oil Fields (37.27%); Talos Energy (35.03%); Enviva Partners (34.16%); Centennial Resources (29.98%) PRIVATE: Talen Energy (power generation); Avant Energy (power generation, Mexico); Rover Petroleum (oil and gas company); Ridley Terminals (Canadian terminal operator); Converge Midstream (oil storage company); Canadian Non-Operated Resources (oil and gas company); Carrier Energy Partners II (oil and gas company); Birch Permian (oil exploration and production); Fieldwood Energy (oil exploration and production); Hammerhead Resources (oil reserve acquisitions); Liberty Resources (oil reserve acquisitions); Onyx Power (power generation); Ridgebury H3 (tanker acquisitions); International Matex Tank Terminals (19 oil terminals in US and Canada); Three Rivers Natural Resource Holdings (oil and gas company); Lucid Energy II

	(gas pipeline system); Salt Fork Resources (oil and gas company); Admiral Permian Resources (oil and gas company); Mainline Energy Partners (oil and gas company); TrailStone Group (commodities trader)
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