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Risk Mismatches and Inequalities: Oil and Gas and Elite Risk-Classes in the U.S. and Canada

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Abstract

There has been a recent renewal of approaches to the study of class and inequality, including Bourdieusian class analysis, the new economics of inequality, and Marxist class approaches. Despite the importance of these approaches, they have a common baseline that this paper problematises. This baseline is that these approaches to inequality identify the economic dimension of inequalities as one in which a series of *goods* are produced, and then different individuals or groups are able to employ certain types of powers to disproportionately appropriate or accumulate these goods. Without denying the importance of inequalities in *goods*, this paper focuses on another set of processes that are interacting with the process of the distribution of goods — the *production and distribution of risks*. This paper employs the concept *risk-class* to analyse how inequalities are emerging from systematic *mismatches* between a group's share of the benefits from the production of risk and their share in the damages from the distribution of these risks. Bringing together an analysis of the oil and gas industry with recent discussions of inequalities emerging from financial risk, this paper identifies *risk-class-elites* whose advantageous risk positions are secured at the cost of intensified risks for the already least advantaged.

Keywords: Class inequalities; elite risk-classes; oil and gas; risk-class; risk mismatches.

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Driven by recent increases in inequality, especially at the top, there has been a recent renewal of approaches to the study of class and inequality, including the rise of Bourdieusian class analysis (Savage et al., 2013, 2015); the development of the new economics of inequality (Piketty & Saez, 2003; Atkinson et al., 2011; Piketty, 2014), as well as the continued strength of Marxist class analysis (Wright, 2005; Lapavitsas, 2009, 2013). These literatures share three key characteristics. First, they are all *systematic* and *explanatory* analyses; second, they focus on inequalities in the distribution of *goods*[1]; and, third, the production or distribution of *risks* is not a key analytical object within their analyses. This paper aims to develop an approach to class and inequality that builds on the important strengths of existing class and inequality approaches — their systematic and explanatory quality and their attention to the impact of inequalities in goods — while also redressing the lack of systematic attention to the impacts of contemporary risks. From the 2008 financial crisis to the oncoming, series of environmental crises, socially produced risks are in many ways fundamental to people's social power and life chances in contemporary societies (Beck, 1999; Schlosberg, 2007; Walby, 2015); as such it is necessary to integrate the systemic impacts of risk into studies of inequality.

The key analytical move in pursuing this task of meeting contemporary studies of inequality with the systemic impacts of risk is the introduction of *risk-class* (Beck, 2013, 2016; Christophers, 2015; Dorn, 2016; Tyfield, 2018). To further advance the study of risk-class, the focus of this paper will be on systematic *mismatches* between the benefits and costs of risks between groups. Recent research has demonstrated how senior employees in financial institutions have been able to benefit from systematic mismatches from the production of risk in the lead-up to the 2008 financial crisis, while minimizing their damages from the crisis. Senior finance employees were able to engage in risk mismatches by benefitting from the amplification of financial risk whether or not the risks they generated were realised in significant losses for the ultimate asset holder (Curran, 2015). These processes of risk mismatches contribute to a larger literature on finance and inequality (Kaplan & Rauh, 2010; Lapavitsas, 2013; Tomaskovic-Devey & Lin, 2013); yet given the preponderance of discussion of top incomes focused on finance, it is possible to interpret this development as primarily about something special about *finance*, rather than about *flows of risk* more generally. Yet, without denying the specificities of finance, this paper argues that some of the central risk and inequality processes that occurred in the lead-up to and aftermath of the crisis are not limited to the financial industry, but rather can be seen to be occurring in other spheres of life as well. This paper argues that similar systematic processes of risk mismatches have occurred in the differences between the distribution of benefits and costs from production in the oil and gas industry in ways that are importantly similar to those that occurred in finance.[2]

This is where risk-class analysis offers a potential analytical advance — providing a means to investigate whether existing analyses of finance and inequality, while important, are in some ways excessively specific and hence unable to identify emerging amalgams of wealth production and risk that are restructuring contemporary power relations. Despite the claim that analyses focusing on financialisation and risk are unnecessarily limited in scope, this is not an attempt to displace class as goods by risk-class analysis (or even to displace the financialisation literature per se), but rather to develop potentially complementary relations to identify systematic processes that are illuminated by viewing contemporary economy through the register of *risk as an object*

1. "Goods" can be broadly understood as various goods and services, both public and private, that are produced and distributed and the economic resources that can aid in their acquisition.

2. The analytical framework here thus can more closely link the concerns of critical studies of finance (see Engelen et al., 2011) with green political economy (see Barry, 2016).

of production and distribution with highly unequal systematic impacts.

Whether we are seeing the emergence of an *elite risk-class* that can systematically benefit from the production of risk, while being able to minimise their exposure to the damages from these risks — thus massively benefitting from the risk cycle as a whole — is a question that has been broached in analyses of finance (Curran, 2015); yet for these to be *risk* processes rather than merely *risk-in-finance* processes it is necessary to extend the scope of analysis. Showing how systematic risk mismatches are occurring and that they are making an important contribution to contemporary inequalities not only has the potential to contribute to debates over inequality — it also raises the question of whether debates over how to regulate finance need to be extended much more broadly to include other industries that have the power to produce massive social damage and intensify inequalities through risk mismatch processes.

This paper proceeds in three steps. First, risk-class analysis and the concepts of risk mismatches and elite risk-classes are introduced and briefly situated in the existing literature. Second the paper shows that significant mismatches have emerged from the production and distribution of risk in the oil and gas industry. Last, the paper concludes by briefly querying whether this analysis of risk mismatches can provide the basis of a different critique of contemporary inequalities than existing critiques.

1 Risk-Class and Systematic Risk Mismatches

The concept "risk-class" emerged from a debate with Ulrich Beck (2013; see also Curran, 2013). Previous critiques of Beck's account of risk and class had argued that he was wrong to reject class analysis and *therefore*, despite, perhaps, its other potential strengths, the risk society approach was not useful for understanding contemporary class or inequalities (Scott, 2000; Mythen, 2005; Atkinson, 2010). Curran (2013), on the other hand, agreed with Beck's critics that he had missed the continued importance of class in contemporary society, but then asserted that Beck's critics had missed the way in which, even from within the risk society perspective, the rejection of class was based on idiosyncratic cases of risk and that in fact suitably restructured, an *uneven risk society* perspective could play a key role in illuminating existing inequalities. Risk-class analysis thus builds on Beck's prescient idea, which he unfortunately did not further develop, that "Risks like wealth are the object of distributions, and both constitute positions — *risk positions* and *class positions* respectively" (Beck, 1992, p. 26, emphases added).[3]

As with any concept, if it is to hang on the world in some significant way, there are preconditions. In this case, the concept "risk position" is an abstraction that aims to integrate the multitude of socially produced risks into a systemic social position of disadvantage or advantage — despite lacking the commensurability of economic 'goods' and exchange value/willingness to pay for goods that is provided by the *goods* that are usually the object of class analysis. Yet irrespective of this limitation in terms of measurement and precision, the abstraction involved in "risk position" can be valuable insofar as it enables us to address the systematicity of the production and distribution of risk in modern societies. In this vein, "risk-class" identifies the intersection of class and risk — how they shape each other without either being reducible to each other (Curran, 2018b).

3. Beck's (2013) lack of theoretical or empirical development of this concept was primarily due to his catastrophic interpretation of risk society, in which he considered that if these risks were not stopped, risk differentials would lose their importance.

This paper focuses on *mismatches* between the benefits and damages from the production and distribution of risks for different groups. Most of the work on risk mismatches has so far been completed on finance. The research in finance has shown how systematic relations of organized irresponsibility have been shown to play a key role in enabling mismatches between the benefit and distribution of risk (Curran, 2015). Organized irresponsibility may be glossed as a social relation in which agents, through the interaction of their acts with others' actions, collectively create risks for which they are able to avoid being held individually responsible. Organized irresponsibility tends to occur in contexts where risks can be generated in complex ways that avoid legal responsibility (Giddens, 1999). In many cases an individualistic approach to law that focuses on definite individual harms, while neglecting how complex causal relations of harm, creates the opportunity for organized irresponsibility (Curran, 2018). As Beck (1995) has previously argued: "[W]hat good is a legal system that prosecutes technically manageable small risks, but legalizes large-scale hazards on the strength of its authority, foisting them on everyone, including even those multitudes who resist them?". (p. 69)

Nevertheless, organized irresponsibility generally involves not only relations of harm for industries to acquire the "social license" to systematically produce harm. As with finance and the oil & gas industry, it is cases where the production of risk is intricately interconnected with the *production of goods* that relations of organized irresponsibility are allowed to proliferate. Prior to the 2008 financial crisis, finance was viewed as a massive engine of prosperity for many economies across the world (Engelen et al., 2011). Likewise, the oil & gas industry has generated massive levels of wealth. Yet, in the case of finance, both the benefits and the damages from the production of risk and the distribution of risk are highly uneven (Curran, 2015). As shown below, this is also true of the oil & gas industry.

Insofar as the distribution of gains and damages from socially produced risks is neither random nor equal, but rather systematically shaped by existing social powers, then it is possible to conclude that there is the existence of different "risk-classes". The primary target of analysis of risk-class analysis as of yet, has been at the respective ends of distribution — in particular the elite and most disadvantaged in terms of facing the positional or relational distribution of environmental risks and the disproportionate distribution of benefit and cost from the production of financial risk for differently situated groups. This paper though aims to advance this literature by providing a more general framework to show that the types of mismatches of benefit and cost from risk in finance is also occurring in other areas of life and hence it may be possible to increasingly talk in more general terms of *risk-class-elites*.

In terms of theorizing elites, this paper follows Khan (2012) in identifying elites as groups of individuals who exercise disproportionate control over keys social resources. Building on classic analyses of elites in terms of power wielded (see Mills, 1956), risk-class elite analysis identifies power processes that both enable the appropriation of goods *and* the ability to avoid the socially produced risks which continue to accumulate as the cost of unending growth.

The cut-off between genuine elite risk-classes and the more general advantaged risk-classes is very difficult to identify at this point. Nevertheless, as a starting point the paper orients the analysis of elites to the intersection of those who systematically benefit from risk mismatches with more conventional accounts of economic advantage associated with the new economics of inequality, such as the top 5%, 1%, 0.1%, and 0.01% of the population (Piketty, 2014). At this stage though, it is not possible to provide an operationalisation of the different risk-classes or to provide different risk-class categories of the type provided by Savage et al. (2013, 2015) in their

seven class system,[4] In response to this potential limitation, it can be said that while evidence does need to be provided for new theorisations, insofar as data is not collected in a way that is oriented to new theoretical problematics there are limits to the potential empirical detail that can be provided for new theoretical approaches. Yet, insofar as evidence can be provided for the existence and importance of these risk mismatch processes, then an important advance can be made which can be further supplemented with more detailed empirical studies in the future.[5] The following section builds on this analysis of risk-class and risks mismatches to show that they are playing an important role in inequalities being generated from the oil and gas industry.

2 The Oil and Gas Industry, Environmental Risk, and Systematic Risk Mismatches

Unlike contemporary finance, which is sometimes explicitly described as a primarily unproductive activity that does not benefit the vast majority of individuals in society (Lapavitsas, 2013), the case of fossil fuel extraction and elites is more complicated. There are clear benefits throughout society in the extraction, refinement, and utilisation of fossil fuels in supporting existing quality of life. Yet, alongside its benefits, fossil fuel extraction is also playing a key role in production of climate change, with massive negative externalities from the industry that are not being adequately internalised (Royal Society, 2009; Organisation for Economic Co-operation and Development [OECD], 2013, 2018; Van Dender, 2017).

Yet, even if it is the case that different stakeholders other than elites benefit from the production of environmental risk associated with fossil fuels this does not preclude the use of risk-class analysis. It is not a precondition of this analysis that only some benefit from the processes that produce the risk; rather the key focus here is the *mismatch* between the *proportion of benefit* from the production of risk and the *proportion of the distribution of risks* for different groups. Insofar as some groups gain a larger share of the benefits of oil and gas production than their share of the risks from this process, then they can be said to benefit from an *advantageous risk mismatch*. Insofar as some groups receive a disproportionately larger share of the risks than the benefits from the production of oil and gas production, then they can be said to suffer from a *disadvantageous risk mismatch*. Consequently, risk-class analysis can investigate not only excessive levels of production of environmental risk, but also the balance or disproportionationality involved in the differentials between benefits and damages from the risks associated with fossil fuels (among other pollutants) for different groups.

The relationship between finance and top incomes has been widely discussed (Kaplan & Rauh, 2010; Crotty, 2010; Philippon & Reshef, 2012; Lin & Tomaskovic-Devey, 2013). Moreover, risk-class analysis has already identified systematic mismatches between the distribution of benefits and costs of risk in the lead-up and after-math of the financial crisis between elites in finance and the least advantaged in the UK and US. There have also been some important treatments that discuss environment and inequality (Roberts & Parks, 2007) and there has been some evidence provided regarding the role of oil production in rising top incomes (Galbraith, 2012, pp. 136–139; Lemieux & Riddell, 2015, pp. 37, 39, 43); yet the two discussions on finance and oil and gas have not yet been brought together in a systematic manner. There are however, as argued below, powerful affinities between finance and oil and gas in how key

4. See Adkins et al. (2021) for a cutting edge analysis of contemporary configurations of class, which also does not provide a list of clearly-defined classes.

5. On this point, see Habermas (1975 [1973]).

segments of contemporary elites have engaged in intensive and systematic risk production as the means of acquiring their riches, while using the power from this risk production to minimise their exposure to the risks they contributed to producing. Oil and gas has always been an industry that offered the possibility of great wealth while also generating environmental problems (Yergin, 2008). Nevertheless, the increasing importance of climate change, alongside the growing importance of more intensively polluting unconventional forms of resource extraction, and the continued escalation of wealth emerging from the industry (Klare, 2013; Adkin, 2016) suggests that investigating risk-class inequalities emerging from the oil and gas industry is as urgent as investigating the risk-class inequalities and financialisation of advanced economies around the world.

The following analysis focuses in particular on the benefits of the production of oil and gas in the United States and Canada to serve as a means of identifying the workings of risk mismatch processes that can arise more generally in contemporary capitalism, while also contributing to further characterizing the political economy of risk-class in Anglo-American capitalism. While the scope of this analysis is necessarily limited, the US and Canada are not idiosyncratic cases; they are amongst the world's largest oil producers (being first (US) and sixth (Canada) in 2016, first (US) and fifth (Canada) in 2017, and first (US) and fourth (Canada) in 2018 (British Petroleum [BP], 2019, p. 16). Additionally, both of them have been at the forefront of unconventional oil production, which tends to greatly intensify the environmental risk produced from oil extraction (Bridge & Le Billon, 2017, p. 13). Moreover, of the top ten producers in 2015 and 2016 they are the only two countries that are democratic, liberal capitalist countries with diversified economies, while the others (Saudi Arabia, Russia, China, Iraq, Iran, UAE, Kuwait, Venezuela; see Bridge & Le Billon, 2017), are all, except for China, in many ways petro-states, where establishing the centrality of oil production to inequalities would be easier to demonstrate. As such, bringing these risk mismatch processes into the centre of financialised, Anglo-American capitalism can provide a powerful case for justifying the importance of the risk prism for understanding contemporary political economy and inequalities.

2.1 Benefits from Production of Risk in Oil and Gas

Oil and gas has played a key role in top incomes in the US for quite some time, even if incomes emerging from finance[6] have exceeded it in recent years (Volscho & Kelly, 2012, p. 684). Oil and gas extraction has commonly been one of highest paid sectors of the economy. In 2010–2016 in the US, it was the employment sector with the second highest average pay after "securities, commodity contracts, and investments" ($224,618), with an average pay of $164,811 in 2016.[7] In the US between 1998–2016 oil and gas extraction had one of the highest increases in average income (120 per cent in nominal terms). Increases in oil and gas extraction over this period of time even outpaced increases in pay in employment in securities, commodity contracts, and investments, despite the fact that 2014–2016 saw again strong growth in finance, alongside more challenging years in the oil and gas industry (BEA, 2017).[8]

6. Specifically from FIRE (finance, insurance, and real estate).

7. All discussion of pay in the US is in USD, and all discussion of pay in Canada is in CAD.

8. The dataset ran from 1998–2016. A new dataset was released in 2019, but this dataset only runs from 2011–2018, thus making it inadequate to measure these longer changes. Likewise, before 1998, the classifications of incomes were different, thus making it more difficult to compare across datasets. Nevertheless, these results are not specifically dependent on the choice of the beginning year — even between 2002–2014 the results are the same — increases in oil and gas extraction outpace increases in pay in the securities industry (and in fact

The oil and gas sector has also played a massive role in the rise of top incomes and increasing inequalities in Canada, a result which likewise has been manifested in many other developing countries in even more extreme ways (see Buccellato & Mickiewitz, 2009; Osuoka & Zalik, 2016). Between 1991 and 2011 in Canada, there was an enormous increase in the portion of workers in the top 1 per cent incomes in Canada employed in "mining, quarry and oil and gas", almost trebling, from 2.5 per cent to 7.1 per cent (Lemieux & Riddell, 2015, p. 37). This increase is even more startling when it is taken into consideration that mining, quarry and oil and gas had only 1.1 per cent of employment in Canada, an overrepresentation ratio of 6.45 times what would be expected if each sector was equal in pay (Lemieux & Riddell, 2015, pp. 37, 39, author calculations).[9] Employment in mining, quarry, oil and gas likewise enjoyed the highest overall pay levels, with average pay of $79,406 in 2010 far exceeding average pay in finance and insurance of $58,510 and average pay in other areas of employment such as manufacturing ($42,701) (Lemieux & Riddell, 2015, pp. 37, 39; all of these figures in 2000 CAD dollars). This classification of top pay in oil and gas though significantly underrepresents high pay specifically in the oil and gas industry. A more specialised study of top incomes found that in 2010 "Oil and gas extraction" jobs earned an average of just under $200,000 per year, which was almost quadruple the average income of $51,000, while the next (mining) was significantly less than this (just over $120,000) (Tombe, 2015, p. 11; all CAD 2010 dollars).

Even within the top incomes itself, mining, oil and gas have a long footprint, with executives (senior management) in this industry who were in the top 1 per cent being paid an average of $639,084 in 2010, which was significantly higher than senior managers in other industries who were in the top 1 per cent of total incomes, including finance and insurance ($411,622). While more disclosure is needed on the distribution of pay within the industry in a way that is similar to disclosure of high pay in finance since the crisis (see New York State Comptroller, 2013), it is clear that the benefits to employees in the oil industry in terms of pay have been extremely high and that they are distributed to only a small portion of the population. Even in Canada, in which its political economy has been increasingly influenced by oil extraction, only 1.1 per cent of the population works in oil and gas, mining and quarry (Lemieux & Riddell, 2015, pp. 37, 39).

Yet, it might be queried, do employees in the oil and gas industry benefit from the production of risk in the same way that senior employees in finance do? As Haldane et al. (2010) show, in finance, senior employees benefit from the production of risk through a process of "risk illusion". Risk illusion occurs in finance when a financial transaction that primarily involves the production of additional risk is presented as if it is primarily the production of economic value. For Haldane et al. (2010) the lead-up to the financial crisis was rife with risk illusion, which was used to justify massive bonuses for senior finance employees, despite their relatively small production of genuine economic value.

Additionally, it might be objected that high returns in oil are fundamentally shaped by the cartelisation of oil supply, in particular through OPEC. As Yergin (2008) shows so convincingly, since the late nineteenth century, if oil supply levels on the market are not controlled, by either government, international organisations, or oligopolistic market structures, then oil

all other industries) (BEA, 2017). While 2016–2018 have been more difficult years, pay is still extremely high in the oil and gas industry (BEA, 2019). Moreover, it should be noted *that the market risk they are bearing is not the environmental risks that they produce, but rather general economic risk which all firms and workers face*.

9. Employment in mining, quarry and oil and gas only increased from 1.0 per cent to 1.1 per cent in share of employment during this period of time, so despite the massive boom, this did not result in significant increases in employment levels.

supply fluctuations constantly threaten the profitability of the oil industry. Yet, while limiting competition plays a key role in high pay in the industry, another key factor is that only a small part of what the oil industry is producing is being commodified. While the specific product that they provide to others is priced at the maximum price the market will bear, the impacts of the massive carbon emissions produced through these processes have not been paid for. In a different form of "risk illusion", while the oil and gas industry produces a massive amount of environmental risk and massive profits and wealth, only the latter has an institutionalised reality — the risk produced is neglected when it comes to the construction of the circuits of power in society via purchasing power.

While carbon taxes can in part rectify these externalities, their current levels are too low to adequately charge for the risk produced (see also Organisation for Economic Co-operation and Development [OECD], 2013, 2018; Van Dender, 2017) and even if they were raised now, they would not redress the decades of benefits based on systematic risk production. Oil companies, especially in the US and Canada, have seen since the second half of 2014, alongside very strong growth in oil production,[10] significant challenges as a combination of higher costs and lower prices due to how increased production, has squeezed profits (Globe & Mail, 2019; NASDAQ, 2019). Moreover, the potential for more robust climate change legislation and 'stranded assets' does create potential future business risks for these companies. The inability of oil companies to collectively limit supply levels so as to raise prices and the risk of stranded assets could potentially shift so that points of risk mismatches move away from oil and gas; however insofar as these costs are not adequately internalised, societies around the world continue to be vulnerable to the type of risk mismatches that the fossil fuel industry has benefitted from for decades.

In terms of another key dimension of the distribution of benefits, the *consumption* of fossil fuels plays a key role. There has been recent research that has shown in a very significant way the vast international differences between wealthy and poor nations in terms of carbon emissions (Roberts & Parks, 2007). As Bridge & Le Billon (2017, p. 19) show, while in the US on average 24 barrels of oil are consumed per 1000 people per day, in Bangladesh 0.7 is consumed. Put in other terms, while the US consumes 20 per cent of world oil production, they only have 4.4 per cent of the world's population — an overrepresentation ratio of over 4.5 to 1 — which is made up for by the rest of the world (see Bridge & Le Billon, 2017, p. 19; see also British Petroleum [BP], 2017, p. 15).

Most statistics of unequal oil consumption focus on the international dimension and while it is important, the intention of this paper, in analysing risk-*classes* is not merely to remain at the level of the nation-state, but rather to explore the highly differential benefits of groups within and between nation-states.[11] While the development of disaggregated accounts of how different economic groups' consumption within countries contribute to carbon emissions is still in the emergent stage, recent research in this vein suggests that it is particularly important to be

10. From 2013–2018 the US saw a 52% increase in oil production, while Canada saw a 30% increase. Recent trends are even stronger. Both countries saw very strong annual growth in oil production from 2017–2018, with the US showing a 16.6% annual increase, while Canada showed an 8.5% increase (British Petroleum [BP], 2019, p. 16).

11. This is not to say that how states differentially benefit from the production and distribution of oil and the risks emerging from its consumption is not important (Bridge & Le Billon, 2017, p. 33). Still, given that the primary benefits of oil production and use emerge from their production going on within the country (i.e. through royalties, taxes, potential economic multipliers) and consumption within the country (taxes on its use), it does not defeat the mismatch analysis that some groups that are producing and consuming greater levels of oil are benefitting from the production of oil, while also being able to use this wealth to minimise their risks (see below).

attuned to carbon emissions from elites, rather than simply average national consumption. As Chancel & Piketty (2015, p. 35) show, consistent with recent trends in inequality, while inequalities between nations is declining (primarily because of China's rise), inequalities *within* nations is actually increasing. While data on the exact levels of CO_2 emissions caused by *consumption* are more difficult to estimate than those from production — largely due to greater policy and academic attention on production (Chancel & Piketty, 205, p. 28), attention to consumption differentials between economic groups identifies even more startling inequalities. The world average annual per capita tonnes of CO^2 emitted per person's consumption was 6.2 in 2013, while Western Europeans were double this at 13.1 $_tCO_{2e}$ per annum. Per capita consumption in Canada and the US was even higher, averaging 22.5 $_t$CO^2e~ per annum (Chancel & Piketty, 2015, p. 28). These are startling differences, effectively allowing those in the US and Canada to occupy 3.6 times more of the current carbon space of the world than the average (which is made even worse by the fact that this trajectory is completely unsustainable) and 11.8 times more carbon space than per capita use in Africa (Chancel and Piketty, 2015: 28). These average numbers of North America though hide massive inequalities *within* these wealthy economies. Despite an already extremely high average of 22.5 $_tCO_{2e}$ per annum, Piketty and Chancel (2015: 29) estimate that top 1 per cent in the US (constituting 3.16 million people) annually consume on average 318.3 $_tCO_{2e}$, while in Canada, which is also one of the top emitters per capita, the top 1 per cent consume 203.9 $_tCO_{2e}$, which is respectively 51 and 33 times the world average and 244 and 156 times current estimates of sustainable levels of carbon emissions.[12] These are stunning differentials, which suggest that while the nation prism has an important role to play, attention to a risk-producing elite *within* nations requires further analytical and empirical attention.

Again, one possibility is to dismiss the risk register and focus on industry-specific characteristics — which admittedly has its virtues in terms of providing additional specificities. Yet a barrel of oil is never simply a generic barrel of oil in terms of its environmental impact and risk redistributive impacts. The rise of unconventional oil extraction methods have led to a further fusion of science and industry in the oil and gas industry, increasing the need for research and development and highly educated and remunerated employees. However, unconventional oil is often the type of oil that generates significantly greater environmental impacts (Bridge & Le Billon, 2017, pp. 14–17). As one recent study of the life-cycle environmental impacts of different oil wells showed, in terms of environmental risks a barrel of oil is not equal to any other barrel of oil. For example, bitumen extraction and refinement processes associated with unconventional oil extraction in the Alberta oil sands is associated with significantly (40 per cent or even more) higher carbon emissions per barrel of oil than the average oil well and up to 70 per cent higher than some of the lowest emission oil wells (Brant et al., 2015, p. 36).[13] As such, attention to the flows of risk and benefits across social-economic life can provide insights that solely industry specific or class-as-goods analyses do not yield.

12. Their estimates suggest that the top 1 per cent in the US consume approximately 3536 times as much carbon emissions annually as the bottom global emitters — which they identify as the bottom ten per cent in Honduras (Chancel & Piketty, 2015, p. 29) and 2122 times more carbon emissions than previous estimates of emissions of the poorest 7 per cent of the population in India (Parikh et al., 2009 in Chancel & Piketty, 2015, p. 29). The top 1 per cent in both the US and Canada are estimated to be amongst the top 5 groups in the world for carbon emissions through their consumption.

13. In this vein, it has been recently noted, that with the rise of "extreme oil", in the Alberta oil sands it now takes one barrel's of oil worth of energy to produce three barrels of oil, while 30 years ago one barrel's of oil of energy would have produced 100 barrels of oil (Kopecky, 2012; see also Klare, 2013).

2.2 Costs of the Production of Risks

While many industries generate pollution in producing their products, the oil and gas sector, alongside with the coal industry, clearly occupies a position of, at the minimum, *primus inter pares*. Fossil fuel extraction and use is the disproportionately dominant process contributing to one of, if not the, greatest problem of our age, climate change. As suggested above, those working in the industry have disproportionately benefitted from these processes, with recent increases in average pay well in excess of average pay across the American and Canadian economies (oil executives have likewise benefitted, often in more extreme manners, in areas with a weaker rule of law, such as Russia and West Africa; see Buccellato & Mickiewitz, 2009; Osuoka & Zalik, 2016).

As discussed above, the benefits of fossil fuel extraction in the US and Canadian context are clear and while more could be done to identify in particular the distribution of the benefits from the production of oil and gas, these benefits can be expressed in standard economic inequality measures. The costs though, in particular climate change, push existing systematic metrics of inequality outside of their primary area of focus on income and wealth figures, which do have the virtue of being relatively easily converted into interpersonally comparable measures due to their measurement in money. In terms of the costs of excessive oil and gas production it is more complicated to generate such measures. Many of the impacts — including increases in food insecurity, potential for displacement, political risks, potential for disasters, and floods and fires (Stern, 2007; Urry, 2011)[14] — are not easily converted into interpersonally comparable numbers. This is a challenge to risk-class as an operationalisable research programme, yet given the importance of excessive risk production and massive risk transfers, this should not be considered as an insuperable impediment. Risk-class analysis aims to trace systematic flows of benefits and risks, even if not easily monetised or quantified. Following Amartya Sen's example in highlighting the importance of capabilities, despite the challenges in measuring them (Sen, 1993, 1999), modifying our methods to measure what is most important is preferable to modifying what we measure so as to fit our methods.

As emphasised above, simply receiving a disproportionate share of the benefits of the production of risk is not sufficient in itself to occupy an elite risk-class position. If one is particularly exposed to a high share of both the benefits *and* the costs of the risks then one is not overall better off from processes of excessive risk production; however, as with finance, elites in oil and gas are particularly well positioned to minimise their exposure to these risks, while continuing to receive the disproportionate share of the benefits.

As has already been widely emphasised, it is the most disadvantaged within global and local societies that will bear the brunt of climate change (Roberts & Parks, 2007; Beck, 2010; Chancel & Piketty, 2015; Wolf, 2017). Yet, it is not just absolute levels of wealth that matter, but rather one's *position* of economic resources *vis-à-vis* others that is fundamental to being distributed or avoiding the distribution of risks from climate change. In particular, higher rel-

14. The damages from the consumption of fossil fuels in terms of climate change are the primary focus of this article though there are growing concerns regarding other damages from oil extraction, especially from unconventional, shale gas oil or bitumen sands, which require greater use of chemicals and threats to the local environment (Bridge & Le Billon, 2017, p. 15). While a possible objection is that these local damages minimise the risk mismatch, in which high paid employees are also exposed to environmental damages, the reality is different due to the fact that most high paid executives work and live in the cities where head offices are located (Dallas, Houston, Calgary, London) not on-site in the oil sands or shale gas sites. In one case where within city oil drilling in one of the cities containing many head offices was proposed, the north-west of Calgary in 2012, there was significant local opposition, which prevented the drilling from occurring (see VanderKlippe, 2012).

ative levels of income and wealth enable the already advantaged to occupy *private escape routes* from risks such as spatial vulnerability, food insecurity, and to exhibit higher levels of *ex post* resiliency through the monopolisation of scarce social goods that are provided through market provision (Curran, 2013). The specific nature of the risks from climate change are diverse and important, ranging from the threats to food insecurity from the growing likelihood of a catastrophic failure in specific basic crops to the intensification of droughts and flooding in vulnerable areas in Asia (McKie, 2017; Peel, 2017). As they currently exist in the *space of risks*, it cannot be known which will actually be realised, but what is strongly supported in the existing literature is that it is the least advantaged, not those who enjoyed the vast majority of the benefits from the processes that produce climate change, that will be disproportionately damaged by whichever risks are actualised (see Roberts & Parks, 2007).

Likewise, as institutionalised in the legal entity of the corporation and its principle of limited liability (Djelic & Bothello, 2013), future legal liability for the massive damages being wreaked by oil companies will not lie with the senior executives who have massively benefitted from the production of these risks. Insofar as the financial crisis provides a model of how legal responsibilities for systemic risk are distributed, then highly reckless behaviour that however did not break specific legal rules in place at the time, is treated very leniently. And when financial compensation is required, financial liability is imposed on current shareholders rather than on those who directly engaged in the activity and benefitted from it. The ability to collectively produce risks but avoid individual responsibility for the cumulative effects of a multitude of individual actions, *organized irresponsibility*, is a key social power — and fundamental to how corporations are managed by the law, thus further reducing the likelihood that those who benefitted most from these risk processes will also be disproportionately exposed to the risks they aided in creating.

2.3 Mismatch

While the benefits from the production of oil and gas in contexts of risk illusion enable significant benefits to an extremely highly paid group, not only will they not receive a disproportionately high level of the damages — the pay they receive from the production of risks will actually enable them to be last in line to receive these risks through their ability to monopolise socially scarce private escape routes from risk. Consequently, the *mismatch* between their share of risk and of the benefits creates the potential for a particularly *vicious feedback cycle* in which advantaged risk-classes disproportionately benefit from the production of risks and *then use this wealth gained from the production of risk* to minimise their exposure to the risks that they played a key role in generating. By occupying these scarce private escape routes from these risks, it thus enables them, without necessarily having to intend to, to then *dump* or *transfer* these risks onto other less disadvantaged groups. Even when the die is rolled the wrong way for elites, as when the flooding of the Bow River damaged the homes of some of the wealthiest in Calgary (alongside others who were distinctly less advantaged), they have the resources to handle skyrocketing rents and housing costs due to the shortage of homes from the flood in a way that the less advantaged do not.[15] While an analysis of finance and oil and gas extraction solely in

15. Between 2012, the year before the flood and 2014, the year after flood, Calgary had by far the highest increase in rents of the highest rental costs amongst major cities in the country, with their average rent costs shifting from third to first highest rental costs between 2012 and 2014 (Canada Mortgage and Housing Corporation [CHMC], 2017). While there are other factors involved in this shift, including the lack of rent controls in Alberta, the destruction of significant numbers of affordable housing and extremely low vacancy rates following

class terms could describe this process as one of mutual, though unequal, benefit from the additional production of wealth associated with the production of more *goods*, it is the prism of risk-class alongside the class prism, that can illuminate the dysfunctional nature of this cycle. It is not merely unequal benefit between lower and upper class, but a *mismatch* between disproportionate benefit and the limitation of damages for the elite, and the inverse for the already disadvantaged. This cycle in turn makes the already least advantaged worse off, while the elite can disproportionately benefit from the process as a whole again and again in ever new cycles.

3 Conclusion

There is substantial evidence that there are systematic risk mismatches emerging from the production of wealth and risk in oil and gas and finance and that these mismatches are playing an important role in intensifying inequalities through their unequal distribution of benefits and intensification of risk of the already least advantaged. Bringing this evidence regarding the risk mismatches from oil and gas into conversation with the existing literature on the inequalities emerging from financial risk and the crisis (Green & Lavery, 2015; Sayer, 2015) suggests that contemporary societies may be increasingly facing a *risk and inequality* problem more generally, not just the separate problems of uneven financialisation and excessive climate risk. In the US, the two highest paid income classifications continue to be oil and gas and the securities industry (BEA, 2019). In the UK, leading up to the 2008 financial crisis, two-thirds to three-quarters of the significant increase in the top 1 per cent share was driven by one industry — finance (Bell & Van Reenen, 2014). In Canada, pay in the oil and gas industry is by far the highest, just short of 4 times average income (Tombe, 2015).

It should be noted that the specific articulations of different risk-classes will be impacted by the particular political economy within a country — while oil and gas is more dominant in Canada, in the UK, finance is triumphant. Nevertheless, there is significant evidence to suggest that, between self-enrichment and social risk production in finance and oil and gas we have seen something similar to the emergence of *risk-class-elites*. This is particularly the case if we are willing to rethink inequalities in a systemic way that is more oriented to risk and to shifts in the role that commodities play in achieving functionings such as security and how relatively greater levels of economic resources can allow the elite to avoid key risks. Admittedly, the rigour and operationalisability of existing approaches to class and inequality are superior to risk-class analysis, though given the theory-laden and theory-leading nature of data collection this may change with time. However, irrespective of this question, given the complexity of interactions of social and economic power and inequalities there is no need to view class and risk-class analysis as competitors for a single account of structural sources of stratification.[16]

In terms of the value relevance of inequalities, this attunement to risk mismatches provides a basis for a particularly cutting critique in terms of the relational nature of advantage and the dysfunctional logics that are producing these inequalities. In particular, it provides a basis to question the power of existing elites and the bases of their power in production of risk-for-others. Rent approaches that focus on the transfer or appropriation of benefits from one group for an advantaged group are undoubtedly important (see Lapavitsas, 2013; Tomaskovic-Devey

the flood played a key role in rent increases, which weighed most heavily on the already most disadvantaged (Hjalte, 2014).

16. Risk-class analysis, like class analysis, also intersects with other inequalities, such as racial and gender inequalities (see Curran, 2018b).

& Lin, 2013). Despite the importance of these approaches though, they focus on *transfers* of goods from one group to another. Yet, taking risks themselves as an analytical object of production of distribution can bring out of the subterranean depths the extent to which the advantages of contemporary elite are constituted not just from transfers of goods, such as surplus extraction or the re-distribution between factors of production, but through processes of risk production-for-others and the securing of socially scarce protections from these risks.[17]

With risk-class analysis the distributional paradigm and basis for judging the legitimacy of these relationships shifts from the accumulation and transfer of goods to a paradigm in which some groups create significant damages for others through the process of extracting benefit and avoiding damages. Despite the importance of the renewal of class analysis approaches discussed above, these studies of class inequality continue to be mainly separated from the study of justice and the identification of the illegitimate dynamics of these widening inequalities. Bringing risk-class analysis together with class analysis may then not only aid in identifying new explanations for structural inequality, but also help to bring normative studies of inequalities more closely into confrontation with analytical and empirical studies of these inequalities. As such, bridging these different threads of research can aid in developing a more powerful critique of inequalities emerging from configurations of wealth and risk in contemporary capitalism in an age where the uneven systematic production and distribution of risks is increasingly as important in shaping lives around the world as is the uneven production and distribution of goods.

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17. There are important affinities of risk-class' focus on financial and environmental risk with Harvey's (2003) account of "accumulation of dispossession" and Sassen's (2014) "expulsions". Despite the insights of these accounts, the dispossession and expulsion metaphors focus on the loss of goods by some in processes that benefit others. Risk-class analysis views these processes as being clearer if viewed in terms of both the systematic *production of goods* and the systematic *production of risks* and the interaction of these two processes.

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