NOTE TO READERS:

First off, thank you for reading this paper, as I am sure you all have a lot on your to-do lists. Second, I think I should contextualize this piece a little bit within my dissertation / book project. The project itself (Capitalist Pigs: The Making of the Corporate Meat Animal) draws on two years of research, including almost a hundred interviews and multi-sited ethnography at sites including slaughterhouses, state fairs, public relations firms, brokerages, and lobby groups. Across these spaces, it traces how the meat industry seeks to produce a commodity that best suits market conditions – as biological animal, financial security, object of social imagination, and subject of political contestation - from conception through consumption. In doing so, it sheds light on the tensions and interrelations between market valuation, the value of life itself, and social values in the late-liberal, not-quite-post-industrial United States. The first chapter explores commodification as a physical process, working backward from “ideal” meat to the “ideal” animal through the efforts of the industry to craft the optimal, standardized hog-commodity; this includes a strong engagement with the literature on biopolitics and biovalue. The second chapter focuses on the financialization of the industry, both in terms of the increased influence of finance capital on the structure of the industry and on the relationship between financial capital and animal life itself. The document that follows is an article that draws on the second chapter. It is currently under review as part of a special issue on “Re-imagining the future in financial capitalism” with the Journal of Cultural Economy. I welcome all feedback which I can incorporate into the chapter and into this essay when it comes back to me after the first round of peer review.

Abstract:

Between 2013 and 2014, PED virus swept through American pig farms, killing over 10 million animals and causing a market panic that drove the prices of both physical pork and lean hog futures to all-time highs. This, however, allowed some producers to feed surviving pigs to supra-standard slaughter weights to capitalize on fear-driven price fluctuations via a unique form of biological arbitrage. Seemingly paradoxically, for some, the virus proved massively profitable. Recent work on the “financialization of food” has drawn attention to the influence of finance on the structure of agricultural value chains and to the use of capital markets as an income stream for agricultural corporations. This paper, rooted in ethnographic fieldwork, examines the case of PED and focuses on the material relationship between derivatives and their flesh-and-blood underliers. It argues that financialization creates new modes of interpreting, valuing, and intervening in life itself, as much in the present as in the future. In doing so, it shows how stark perceptual, operational, and conceptual disjunctures between the ostensibly ever-more-intertwined worlds of agriculture and finance can create new forms of business risk and opportunity, and affect key economic functions of financial markets, like price discovery and the distribution of information (while leaving animals no better off).

Key words: Financialization, commodity markets, futures, arbitrage, factory farming, pigs
A Profitable Virus: Life, Death, and Financialization on the Factory Farm

Introduction: A Biography of an Outbreak

In early March of 2013, the American Association of Swine Veterinarians convened its annual meeting at the upmarket Manchester Grand Hyatt hotel on San Diego’s downtown waterfront. The pre-eminent hog health professional group in the world, the AASV boasts over 1000 members from veterinary practice, academia, and industry. Its meetings share the trappings of the ubiquitous corporate events that stuff hotels and convention halls across America: slacks-and-shirt-wearing attendees milling among product displays, sitting in on panels, and crowding sponsored happy-hours. While the on-the-ground work of veterinarians might seem vastly incongruent with such sterile trappings, their purpose in the world of large-scale agriculture has much more to do with the exigencies of corporate America than it does with that of the neighborhood vet. In the world of factory farming, veterinarians are not so much in the business of assuring the wellbeing of individual animals as of assessing, managing and forecasting biosecurity as a business risk at the levels of entire populations of animals (c.f. Blanchette 2015).

In the case of American industrial hog farming, veterinarians work to mitigate the effects of diseases hog production can’t seem to shake, like the endemic porcine reproductive and respiratory syndrome virus (PRRS, or “purrs” in the industry vernacular), and attempt to stay appraised of potential threats. The stuff of nightmares for American pork producers is an outbreak of a virus like Foot and Mouth Disease (which, in infecting much of Britain’s livestock population in 2001, led to one of the largest, costliest, and most controversial animal culls in history) (Franklin 2007), or swine flu (such as 2009’s H1N1 pandemic which killed thousands of people worldwide and wrought chaos with global travel and trade) (Singer 2009, WHO 2010, CDC 2010), which would close domestic and export markets overnight.
At the 2013 AASV meeting, the highly-respected Canadian vet Robert Desrosiers gave a brief presentation mapping the potential sources and vectors of future threats to the North American swine herd. He listed four blips on his personal radar: various forms of influenza, brachyspira sp., periweaning failure to thrive syndrome (PFTS), and porcine epidemic diarrhea virus (PEDv). The latter disease was not unknown. It had already been present in pig herds in various parts of the world, including the U.K. as early as the 1970s and China for the better part of twenty years. But the second decade of the new millennium had brought aggressive new mutations to the virus in China’s booming but disease-ridden industrial farming complex, with an outbreak in 2010 killing over a million piglets (Huffstutter 2013, Lee 2015). Given increased trade in meat, feed additives, and pharmaceuticals between the two countries, Desrosiers pointed out that PEDv could theoretically make the trans-Pacific jump to North America.

This fact was duly noted by the other attendees and potential forms of scanning for the pathogen were discussed. PEDv was now on the agenda, but it was hardly seen as an imminent threat. Even if it had been, it is doubtful if any comprehensive countermeasures could have been put into place in time. Less than six weeks after Desrosiers’ prescient briefing, the virus hit the United States, first breaking on a farm in Iowa in the middle of April. By the end of 2014 it had killed almost nine million pigs, most of them piglets between 1 and 7 days old, diminishing the total American swine herd by upwards of 7 percent. (Smithfield 2014, 48)

Piglets afflicted with PEDv develop thin-walled intestines incapable of processing nutrients, be it from mother’s milk or from artificial sources, leading to malnutrition and dehydration. A coronavirus similar to Ebola, it also causes, as per its name, explosive diarrhea, itself full of millions of particles of highly-infectious disease. During the outbreak, some farms saw one-hundred-percent mortality among piglets, meaning that many operations lost a month or
two worth of pig production, and that if they were only hit once.

Basic logic might suggest that PEDv, by killing off pigs en masse, would negatively impact producers’ bottom lines. Indeed, the outbreak’s rapid and unpredictable spread threw markets into a panic, sending retailers on a buying spree to stockpile pork, and driving lean hog futures prices on commodity markets to record highs on fears of a supply shortage. As pigs kept dying through 2014, however, prices far outpaced the financial losses caused by the disease for many farms. Those operations that had not suffered major losses were presented with a one-off opportunity to keep surviving pigs alive longer and feed them to heavier slaughter weights, capitalizing on the fear-driven price fluctuations created primarily by a disconnect between on-the-farm realities and investors’ and traders’ readings of the state of the market and knowledge about material farm practices. Over the next year, a biological crisis turned into a market panic, which in turn became an opportunity for producers to profit from a very unique form of biological arbitrage. Seemingly paradoxically, 2014 went down in the books as one the most profitable years in history for the American pork industry.

As PEDv unfolded, I was in the process of conducting a study of American pig agriculture. The aim of this project was to explore how animal commodities are imbricated in circuits of capital accumulation and political contestation, and how the life of the literal capitalist pig comes to be valued economically, ethically, and affectively. It was a project that saw me spend time at farms and slaughterhouses, but also commodity brokerages, industry events, and public relations firms, in the American Midwest, New York City, and Washington D.C.. I had already been studying both biosecurity and financial securities, but PEDv provided an unexpected bridge between them. As I followed the American pig through the porcine value chain, that same value chain was reverberating with the physical and financial shocks of the
disease, allowing me to study it from different distances and from different sites. PEDv shadowed my trajectory, inflecting informal conversations, formal interviews, stories in the industry press, and price movements on commodity markets. Throughout, what caught my attention was that the sharp disconnect in the understanding of farming and animals life between financiers and producers led to vastly divergent reactions to the outbreak of PEDv.

Within an economic – and agricultural – landscape where finance capital is widely considered to (over)determine both fundamental market functions like information distribution and price discovery, as well as the logics of practice of diverse market actors, this essay examines how financialization comes to dictate the meaning and value of industrially-produced animals’ life and death, both in the present and in the future. This analysis contributes to the study of financialization by showing a specific case where financial markets allow for the use of living beings in ways that would not exist if not for the imbrication of large-scale farming in capital markets. I argue, first, that financialization should also be seen as a material – indeed, biopolitical - practice in the most literal sense. In the case of PEDv this was visible in the seemingly mundane fattening of pigs to reap gains from diminished supply and inflated prices. Second, I argue that this very mundaneness, however, belied the fact that this new opportunity for profit had been opened specifically up by the perceptual, operational, and conceptual disjunctures between the ostensibly ever-more-intertwined worlds of agriculture and finance.

**Finance and the Factory Farm**

I was sitting with Cassie Logan, iii a commodities trader at a major multinational bank, at the iconic The Financier café in the heart of Wall Street on a Friday afternoon in early August of 2013, just as commodity markets had begun to be mildly spooked by PEDv. Logan, when I had
first met her, greeted my inquiries about “softs” (perishable, biological commodities like corn and lean hogs) enthusiastically. After a few years trading oil and currency, she had begun trading agricultural commodity futures and options and was “really enjoying it.” I soon found out, however, that this had little to do with her interest in or knowledge about agriculture. In fact, she seemed to semi-ironically glory in her ignorance of agricultural practice or politics. “The commodity market” itself, she told me, “is the interesting part. Playing that market.”

Playing the market, in fact, often included purposely ignoring the work of agricultural analysts meant to provide the informational bases for sound decision-making. For one, this was because Logan thought little of her bank’s lead analyst (“He’s really bad.”) and analysis in general (“If everyone knows the same things, it doesn’t matter. And everyone does know basically the same things.”). Rather, trading proficiency lay in playing against other traders and “the market” itself, shunting risk around as profitably as possible and taking advantage of perceived or intuitively felt movement, trends, and discrepancies in price.

Logan, of course, was but one of many players in the market for lean hog futures. Some investors who hold longer positions in the futures market as part of portfolio diversification or long-term gain strategies (like, for instance, pensions funds or national governments) would seek to learn from analysts’ long-term projections and profit from a specific orientation in the commodity market, and pig producers and processors – or the financial agents working for them - would be working off their access to knowledge about the market to take hedging positions. Traders like Logan, however, make money from the spread in commodity prices, holding positions for hours or minutes or even seconds, and from paying attention exclusively to short-term trends, meaning that what happens in the real world to the commodities in which they invest matters very little to them.
PEDv, which was at that very moment killing pigs by the barnful around the United States, affected Logan only to the extent that the prospect of less pigs on the market meant that investors would probably expect pork price to rise, and that as a result futures prices for pigs to be sold six, nine, or twelve months in the future would go up. While markets for goods like pigs work in real time, current events in commodity markets register in futures contracts; the present is read as future value (c.f. Zaloom 2004). Pigs dying on rural Midwestern farms meant that pigs not even born yet were having their market value inflated by trades Logan made electronically from New York City on the Chicago Mercantile Exchange. This is why Logan laughed when I asked her about what she thought about the situation on farms blighted by PEDv. “I don’t need to know the details because I know how the market is reacting,” she told me. For Logan the limit and epitome of knowledge about the hog market was the price of hog futures popping up on her smartphone.

In this, her attitude perfectly represents predominant financial theories which equate – or at least heavily blur the line between – information about markets on the one hand and the prices that ostensibly reflect that information on the other. The agricultural economists Yang and Leatham, for instance, consider that “the price discovery process describes how information is produced and transmitted across markets.” (1999: 359) However, Logan’s actions and reactions in the market, and those of countless other traders, were contributing to the precipitous rise in both lean hog futures and the real price of pork, thereby shaping the actions of players throughout the pork value chain, including pork producers.

The relationship between finance capital and the productive economy – including their mutual constitution and the disconnect between the two - has long been the subject of critique. Long before the current boom of interest in financialization, Karl Marx analyzed the tension
between “industrial capital” rooted in labor and fixed investment and “merchant’s capital,” the financial investment which circulates free from the constraints of consignment to a particular use (Marx 1991[1894], 440). The two, Marx argued, follow different logics: industrial capital is invested so as to generate surplus value through production; merchant’s capital has a far more structural role in that, by profiting strictly from its own circulation, fuels commercial activity under capitalism in toto.

Recent scholarship on financialization has begun to seriously examine the role of “finance beyond its traditional role as provider of capital for the productive economy,” (van der Zwan 2014, 99). This shift has been conceptualized a systemic, global move away from industrial capitalism as the driver of economic growth and structure, with attendant economic, social, and political effects, including the preponderance of shareholder-value and financial-market-driven business practices and the outsized influence of financial markets on the structure and function of economic activity (Epstein 2005, Kripnner 2011 Hall 2012). The emerging consensus seems to be that the balance of power in this relationship, if always theoretically skewed toward financial capital, has now fully shifted to the financial realm. However, this penetration has also been astutely theorized as constituting an “artifice of indifference” to the real economy, whereby finance treats derivatives as a substantive commodity apart from the underliers it represents, “beyond any prior epiphenomenal conception.” (Wigan 2009: 160, 165)

The realm of agriculture and food production has not been immune to these shifts. The growing literature on the “financialization of food” has shown that financial actors and financial capital is reshaping the food system, leading to centralization of control over both food production and distribution by large retailers and producers (Baud and Durand 2012; Burch and Lawrence 2013) and land by major corporate interests (Fairbarn 2014), and increased price
volatility due to increased speculation on agricultural commodities (Clapp 2009, 2014; Clapp and Helleiner 2012; Russi 2013). Some construe this is an epochal change in the food system: a transition to a financialized “food regime” (Burch and Lawrence 2009, McMichael 2012). Clapp argues that this shift has introduced – let us recall Marx and Wigan here - “distancing” within agri-food value chains both in the literal geographical sense and in that “it abstracts food from its physical form into highly complex agricultural commodity derivatives,” thereby shifting “the distribution of power and influence over the governance of the food system” to financial actors far abstracted from tangible commodity production. (Clapp 2014: 798).

On the one hand, this narrative is important and accurate in terms of the trends being identified, especially the growing power of the financial sphere to influence food prices and promote the super-sizing of agricultural production. For instance, as major agricultural producers like Archer Daniels Midland (ADM) sprout dedicated financial divisions trading on the very products these company produce and distribute, and as an ever-increasing number of institutional investors crowds into the “ag space,” the political economy of food is indeed increasingly pervaded by a speculation-driven, return-on-investment mentality.

For all its complexity, however, it is intriguing that this literature generally seems to imply that the agri-business realm is a recent site of financialization, and that financiers somehow do not fit with the world of agriculture. As James Williams points out, narratives like these make the assumption that agriculture and finance constitute a contemporary and “unnatural coupling.” (Williams 2014, 405) Indeed, what some theorists read as the abstraction of contemporary finance from the “real economy” is itself, as has been argued by a number of scholars recently, an abstraction from the real practice of finance, where abstraction shapes practice (c.f. Beunza et al. 2005, Montgomerie 2008, Williams 2014).
While financialization has spread differently to different sectors and different geographies, American large-scale agriculture has de facto been financialized since its inception. (Zaloom 2004) William Cronon paints a picture of a late-19th-century Chicago where the world’s first truly industrial-scale feedlots and slaughterhouses churned out mass-produced meat a scant five miles south of the Chicago Board of Trade, where traders speculated on the future prices of commodities, but operated seemingly in an entirely different world. For all the technological and social developments that helped usher in factory farming, it was access to financial markets and large-scale capital that allowed for its establishment. Roger Horowitz is not exaggerating when he writes that the first industrial-scale meatpackers of Chicago were “more merchant than industrialist, better attuned to the vagaries of credit and demand for commodities then the mechanics of turning live animals into meat” (Horowitz 2005: 48).

But so too did agriculture shape the nature of finance and the early logics of the financialization that now afflict it. The paradigmatic object of financial capital, one that embodies the complex relationship between “reality” and “abstraction” and their attendant regimes of value, is the derivative, a financial product whose value is based on (derived from) that of another asset, the underlier (which underlies its value). Today, the global value of derivatives, many of them highly complex financial instruments, tops out on the trillions of dollars (Bryan and Rafferty 2006), but the principal instrument used in agriculture remains, as much today as in the 19th century, the futures contract.

The futures contract represents a formal taming of temporality and chance, designed to “neutralize the possibilities of loss from unpredictable events.” (Zaloom 2004, 68) However, it also represents an abstraction from the real goods it represents. Such contracts are not made for a particular tangible item (like a particular pig, or pork belly in historical financial parlance) but
for a set quantity of a given good (any pig and its belly). Markets for futures, therefore, have by their very nature and since their inception treated goods and market participants as abstract quantities. They have also inherently fomented speculation, necessitating speculators and their capital to create the liquidity in markets that would ensure that hedgers would find buyers for their contracts. To incentivize this role, which came to be referred to as “market making,” Chicago’s financiers developed the option for buyers and sellers of futures to “close out” contracts without any delivery of goods (like hogs). That is, farmers could lock in prices through futures contracts not with buyers but with speculators, thereby managing risk, and then close out contracts by buying back the same amount of futures they had sold at the going market rate. They might make or lose money off this transaction, but they would have gained some degree of financial certainty and security in making business plans. They would then be free to sell their products to any buyers on the real market. Indeed, they could already have a contract with a buyer and use financial markets exclusively for risk management. Buyers, for their part could do the same. Speculators, meanwhile, given that they make money off fluctuations in price (what is termed the “spread”), would not be concerned with whether prices rose or fell. This system has remained in place to this day. As Çalışkan observes, the “opportunity to trade [a commodity] without owning it is what makes a functioning futures market possible” in the first place. (Çalışkan 2009: 244)

However, the great coup for the financiers was the legitimization of not only their indispensability as providers of capital, liquidity, and risk-mitigation tools for agricultural markets, but the legitimization of prices for agricultural products arrived at in financial markets. For all the practical and theoretical abstraction of financial capital from productive capital, the two utilize prices that, for “the market” as a whole, are for all intents and purposes the same. Of
course, real prices for real commodities vary in particular exchange, but as Çalışkan notes, futures prices are “prosthetic prices” that “the basis for making a price real.” (2009: 246). Early in my research on agricultural finance, a senior banker (and former trader) smirked when I asked him about the relationship between what I termed the two “types” of pricing. “You cannot calculate it,” he told me. “You cannot calculate what the impact of speculation is on real prices and what is the real basis of prices.” Given that in economic models prices are assumed to represent all available information – or, rather, all information deemed necessary for market participants – “distancing” (Clapp 2014) and “indifference” (Wigan 2009) are already always inherent in financial markets’ relationship to physical markets.

This is not to say that information—like USDA crop reports, for instance—is unnecessary. Indeed, it has been increasingly politicized (Clapp and Helleiner 2012, Williams 2014). However, such information already works to translate agricultural realities into standardized, quantified data legible to market actors. That is, if market actors choose to take advantage of them. But many do not. The ignorance evidenced by my trader contacts (or their cavalier attitude: one Chicago trader quipped that “I’ll trade anything if it has a spread. I don’t care.”) is not a rarity.

In short, it is not so much a question of questioning the fit between finance and agriculture, as it is a question of analyzing the effects of one on the other, including the nature of their practical divergences. However, those who note such divergences between the practices of financial and non-financial actors construe it as either as either part of the nature of professional financial culture (Zaloom 2004) or as evidence of the irreconcilable relationship between finance and agriculture (Clapp 2014), the next section shows how this disjuncture turned a biological crisis into a market opportunity for producers by undermining the supposed economic functions
of financial markets like price discovery and the distribution of information. Inspired by studies that show divergence of practice and knowledge between financial actors (Blomberg 2016, Souleles 2017) I argue the disjuncture between financial and non-financial actors in agricultural value chains is itself a productive force that, as the next section will show, temporarily opened up a new opportunity for capital accumulation.

**How to Profit from a Virus: Financialized Pigs and Biopolitical Arbitrage**

In order for the practical disjuncture between the financial and real economies to be tenable, financial markets rely on the expectation that real markets will carry on as they are intended to do: that is, that they will produce certain quantities of a standardized product that will move through a set value chain on to consumers. A CME Group primer explains to potential traders that “At birth, livestock enter into a sort of production pipeline beginning on the farm and terminating at the supermarket. The assumption is that what goes into the pipeline must eventually come out.” (CME Group 2010, n.p.) In other words, financiers, in order to remain abstracted from on-farm production, rely on the expectation that a newborn piglet will reach a slaughter weight of approximately 270 pounds in approximately six months. In those six months, a slew of factors can affect hog pricing, including factors as disparate as disease, public demand, or the cost of inputs like corn and soy. But regardless of fluctuations, pigs are expected to be killed and sold at a more-or-less expected quantity at a pace that matches the time horizon of futures contracts.

The twin mantras of efficiency and standardization already govern modern animal agriculture. Changing production and logistics technologies – marked by the introduction of confinement animal feeding operations (CAFOs), also known as factory farms - have made
economies-of-scale animal agriculture ever more closely resemble any other form of mass commodity production, turning the meat industry into one dominated by a small number of large production and processing corporations, themselves in thrall to, on the one hand, a small number of large retailers and distributors, and on the other highly competitive international markets (Thu and Durrenberger 1998, Watts 2004, Pew 2009, Emel and Neo 2011).

Factory-farmed livestock like pigs are subject to intense and ever-more-pervasive forms of biological control and intervention aimed at maximizing the standardization of their bodies and the maximization of their yield of saleable tissue. (Coppin 2003, Blanchette 2015) Based on a literal reading of Michel Foucault’s argument that biopower focuses on “the body as a machine: its optimization, the disciplining of its capabilities and its integration into systems of efficient and economic controls,” (cited in Holloway et al. 2009: 396), this mass-scale making and taking of animal life has been theorized as a complex process of biopolitical – and thanatopolitical – governance that interpolates animals and humans alike into the logics and necessities of agro-industrial capitalism (Shukin 2009; Youatt 2012; Wadiwel 2002, 2015; Wolfe 2013). This includes as much the management of life as the management of slaughter, given that on factory farms “the death function is both a calculated and standard aspect of the productive process where biovalue is paired with […] necrovalue.” (Dutkiewicz 2013: 303)

These processes are today all thoroughly undergirded by financial instruments. Due to their capital-intensive nature, farms rely on massive loans from banks, often only granted if producers can show that they have margin hedging strategies in place. Producers will also generally hold positions in futures markets, as much for the pigs they produce, as for inputs like corn and soy. All of this is aimed at building as much stability and predictability as possible into
a notoriously unpredictable business marred by shifting consumer demand, fickle weather patterns, equally fickle feed prices, and the ever-present threat of disease.

PEDv shattered any and all predictability. Some degree of animal death from disease is normally expected by farmers and written off as so-called “death loss” on balance sheets and in financial plans. Such standard mortality, as an analyst put it to me, is “built into the price structure.” PEDv, meanwhile, “wasn’t built into anything.” During the early months of the outbreak, with tens of thousands of pigs dying every week, players throughout the industry, feared that the virus would be financially devastating. Outbreaks are rarely good for business. During the 2009 swine flu episode, some hog producers lost $20 per surviving pig and analysts downgraded the stock of processors like Tyson Foods and Smithfield Foods. By late 2013, there were even murmurs among producers about preemptively calling on the government to subsidize them for their impending losses.

It soon became apparent, however, that the virus might actually present a unique business opportunity. Crucially, the disease primarily afflicts piglets rather than more resilient, growing pigs and does present a threat of infecting humans. As such, it did not create a public health scare and did not lead to the sort of heavy-handed sovereign demand for a mass cull as did Foot and Mouth Disease in Britain. Of that outbreak, Sarah Franklin astutely writes that “Foot and mouth is only lethal to domestic animals because it is economically intolerable to humans. […] while not a lethal disease, then, is nonetheless a lethal form of infection” (Franklin 2007, 174). PEDv, conversely, was lethal for millions, but economically tolerable.

As veterinarians, the Pork Board, vaccine companies, and processors sprang into action to stem the spread of the disease, the epidemic undermined the stability of supply for retailers, who went into a buying frenzy in their attempts to secure already-produced pigs and frozen pork
for storage. Seeing this, market-watchers forecast a general pork shortage. Within weeks, these fears spiraled into a full panic, stoked by the information black hole created by the disease. Not only was PEDv’s trajectory not known, with little data about its source or future course, but it was killing pigs that would not have made it to market for six months, creating a time lag for which markets found it difficult to account. Reggie Pedersen, an analyst, told me that “it was a panic situation. … we had no idea what was going on. It was just an information-starved market and I’ve never seen a rollercoaster like that in my career on the hog market.”

Even well into 2014, there were few reliable numbers on how many pigs the disease had killed or how many remained alive. The only statistics available were USDA daily slaughter data, which only covered pigs that had survived the six months to slaughter and therefore provided little useful information, especially in the early months when it only accounted for pigs born before PEDv had broken. To further exacerbate matters, it was difficult for anyone in the market to obtain reliable data on the country’s stocks of frozen pork. The USDA reports on cold storage volume in public and packer warehouses, but not in private processor or retailer warehouses, meaning that as panicked stockpiling moved meat from the former to the latter, reliable procurement decisions proved ever more difficult to make for retailers.

There was a cascade effect at play whereby perceived shortages were being acted on by retailers, and this panic was being compounded by futures traders like Cassie Logan who, several steps disconnected from the industry, were reading only price movements. These rapidly-inflating futures prices, moreover, became the basis for purchasing decisions in “real markets” (a distinction that, as this essay shows, blurs under any real scrutiny). Caitlin Zaloom has argued that while the “future is unknowable […] in global financial markets, profits and protection of wealth depend on actions taken under this necessarily uncertain condition.” (Zaloom 2009, 245)
Trading and “financial knowledge”, she argues, “is organized around the interplay of reason and affect” under such conditions. (Zaloom 2009, 246) But as 2014 dawned, the informational basis for any semblance of rational decision-making broke down almost entirely. The prevalent affect was a blind escalation of prices for the simple reason that prices already seemed to be going up.

Amidst all this chaos, however, many producers faced a relatively clear situation. They still had the hogs that had not died - which for some meant their entire supply – and faced a market with low feed costs and skyrocketing pork prices. For them, the information was all there and the calculus was a simple one: surviving pigs could be kept alive longer and fed to a higher, supra-standard slaughter weight, fetching a higher price. The PEDv-fueled panic had opened the door for a very unique form of arbitrage.

Arbitrage, most succinctly defined, is the practice of attempting to profit by “exploiting discrepancies in the price of the same asset or in the relative prices of similar assets” (Beunza et al 2006, 72). Historically, this meant taking advantage of different prices for the same good in different markets through privileged information or transportation capacity. The classic example is the literature suggests that, recognizing that the cost of gold in Saudi Arabia exceeds the price of gold in New York and transportation costs between the two, an arbitrageur could profit by buying New York gold, shipping to Saudi Arabia, and reselling it at a profit. Contemporary arbitrage, while following similar principles, relies on seeking out similar goods (for instance financial products like government bonds with differing maturity dates) whose values generally track each other and are influenced by similar factors, and seeking out profit opportunities in temporary price discrepancies between them (Beunza and Stark 2004). The focus today is not on distance, but on virtual simultaneity – for instance picking up that for a few seconds the same stock is trading for $5 on the NYSE and $5.03 on the London Stock Exchange. In other words,
arbitrage consists of taking advantage of a spatial, temporal, or information incongruity between somehow equivalent products, for which other market actors have not (yet) accounted. It does not normally involve changing the nature of the commodity itself.

With PEDv, the arbitrage opportunity existed between a price based on the market’s expectation of the supply of meat in six months and the cost of meeting that demand with less, heavier pigs that were alive today. Markets were expecting pigs to provide a standard yield of meat. Futures prices are, after all, prices for standardized lean hogs. Producers, meanwhile, had live hogs that could be fattened beyond standard weights, thereby making up the meat deficit with less pigs. Pigs’ standard life-cycle shaped market expectations and sparked fears of a shortage within five to six months of the outbreak, but this also gave producers a window in which to tweak standard practice to temporarily mass-manufacture supra-standard, overweight hogs. Much as producers aim to produce standardized pigs, actual standard practice always already has inscribed within in the commonsensical adage that, as a farm manager at a major Midwestern operation told me in late 2014, “When you expect price to go down the next week, you sell or kill more hogs, when expect price to go up, you hold on to the hogs.” This is usually done in response to temporary variations caused by mundane market events like brief shortages or surges in demand, spikes or drops in feed costs, and the like.

PEDv, however, stretched this standard operating practice far beyond its limit, from days into weeks and even months. It did so, moreover, not because of standard price fluctuations but because of the fact that the ongoing market panic had led financial markets to dramatically overvalue hog futures because of a complete misreading of on-farm realities. Greg Baumann, a former pork producer and facility manager for a major processor, and now an investment consultant, referred to this strategy as leveraging the “disconnect between population and yield.”
Not only were prices already high, but every additional day pigs were kept alive provided producers marginal gains on a per-hog basis. Pigs that would normally have been slaughtered at around 270 pounds were being killed at over 300. contrary to all financial theory, the underlier had been used to gain marginal productive gain due to fluctuations in the price of the derivative, which themselves had been caused by misreadings of fluctuations in the future price of the underlier itself by players in financial markets.iii This strategy was applied successfully by a number of major producers, including the pork giant Smithfield, which saw a 35% year-on-year profit increase.vi

Of course, producers could also have mass-bred new pigs, but this would have been a far more risky maneuver, because if the disease were to be brought under control, prices would fall and the industry could face an over-supply and therefore potential losses. An overproduction of new pigs would have created an extra layer of risk that, given uncertainty about PEDv’s spread and attendant runaway prices, seemed neither necessary nor worth taking.

The record-high prices pork reached, however, did not necessarily guarantee the sale of heavier hogs. This was made possible by end consumers’ willingness to support high pork prices. An agricultural economist with whom I discussed the question argued that regardless of market activity, what saved producers at the end was “robust demand” for pork, which meant that more expensive meat did not deter buyers. Or, to put it in a less benevolent light, “The big losers were consumers.”

So too did the animals themselves deviate from standard models, clashing with established consumer preferences and product norms. Not only did consumers bear the brunt of the cost of the disease, but they had to deal with the repercussions of the virus written into the carcasses of the animals they ate. Fattened beyond standard size, some had literally outgrown...
standard market demand in a none-too-metaphorical expression of the unnatural profit inflation the disease had allowed. The heavier hogs, tellingly, had larger hind legs. In 2014, the standard, 7-pound half-hams usually consumed at holiday time by American families were in short supply. Given that approximately five million less animals than normal were slaughtered, the market had to cope with a 10-million ham deficiency. And, given higher slaughter weights, average hind legs (where hams come from, lest we forget) weighed in excess of 20 pounds, resulting in larger servings than even most Americans could handle (Mulvany 2014). In a value chain that ends at the dinner table and where standardization works backward from consumer preference to the animal, PEDv disrupted an expected homogeneity, even if this disruption was read by consumers as merely a temporary ham overweight and unwelcome price spikes.

As the disease began to stabilize in November of 2014, lean hog futures had climbed over 6% on the CME while hog slaughter number were down over 5 million head – to 92 million from the year before. Even accounting for record high slaughter weights, total pork supply was still down 1% (Mulvany 2014). That 1%, barely a blip, represented the deaths of millions of pigs and the prolonged life of tens of millions of others, in the final, distilled translation of biovalue into dollars and cents and into, finally, a statistic measuring deviation from the norm, the basis for future assessments of the performance of the industry and the futures prices of the next batch of as yet unborn piglets.

It is without irony that economic analyst Steve Meyer could write that “Since mid-2013, lower feed costs, robust pork demand and the spread of the Porcine Epidemic Diarrhea Virus … have had a positive economic impact on the pork industry as a whole and on producers in particular.” (Meyer 2014, 3) PEDv, with hindsight and translated into a metric of profitability
rather than mortality, became one of three separate but fungible factors contributing to one of the best years in memory to be in the factory farming business.

**Conclusion**

Koray Çalışkan has argued that

> markets are neither embedded in social relations, nor disembedded from them. They are fields of power operating on dynamic and heterogeneous platforms of power/knowledge relations; these relations reflect the logics of economization as informed by asymmetrical relations of power among human and non-human actors. (2009: 265)

Yet most analysts of the financialization of agriculture, while attending to the many complexities of the interrelations between physical agricultural production and the financial markets that support, skew, and increasingly overdetermine it, the place of non-humans in financialized worlds is generally ignored. Perhaps inadvertently, such analysis tends to treat commodities (like pigs), already literal underliers for derivatives in financial markets, as analytical underliers. And yet the pig business is prone to crisis, and when crises occur, it is precisely animals that are often at the center of their causes and solutions. This essay shows the industrially-produced pig to be not only a consumable good, but a financial asset, whose body can become a biological instrument of market intervention.

On the country’s factory farms, on which this essay focused, with the outbreak of PEDv, the American industrial pig, beyond a project of standardized biovalue creation, became a tool for a unique form of biopolitical arbitrage, its rearing temporarily and tactically altered to take advantage of fluctuations in commodity prices. This was made possible exclusively because of the actions of commodities traders and retailers panicking and driving up prices, a situation itself made possible due to the power of financial markets to determine the prices of pigs. This arbitrage was unique in that occurred within the hog herd itself, with the life of surviving pigs...
leveraged against the future expected worth of life that PEDv had extinguished, itself reflected in futures prices for yet-to-be-born pigs. In doing so, it also massively slowed down the time horizon on which markets work. In a world where transactions are measured in milliseconds of computing time and where some have suggested that derivatives should be considered “new forms of money, a new monetization of space-time,” (Pryke and Allen 2005, 265) markets were befuddled by the six-months needed for animals to grow. To make more “rational” decisions, pigs would have had to live (or die) and the markets would have had to wait, but markets are not good at waiting.

In an industry increasingly gripped by a drive to create hedging strategies for every aspect of its practice, the futures market that forms the basis of marketized insurance drove the alarm that inflated the current value of living animals beyond their presumed future value. The anomalous case of PEDv showed that financialization has changed the relationship of markets to the sentient commodities whose value it determines. The animal, not simply a consumable good but also a financial asset, is a raw, material expression of the power of financialization to penetrate into the very fabric of life and death.

By focusing on the effects of financialization on on-farm practices, this essay has sought to contribute to and suggest new avenues for the study of the financialization of food by bringing the study of financialization away from a focus on derivatives and large-scale structural changes and back down to its flesh-and-blood underliers. Bringing a multi-sited ethnographic perspective to the links between financial markets and industrialized animal production, it has attempted to sketch the tensions, links, and dissociations that emerge in “financialized” industries between tangible practice and financial markets, inflecting and altering standard operations in novel and often seemingly paradoxical ways. It has suggested that while financial and physical markets are
thoroughly and perhaps inextricably interconnected and interdependent, they are not integrated.
Indeed, the logics of practice and assumptions about information of actors at different nodes in
the value chain do matter, and, as this essay shows, this division still hews roughly to the
division between “financial” actors” and “physical actors” even as, analytically, this distinction
seems to be disappearing.

Beyond the factory farm, this suggests that financialization does not flatten industries into
set, unitary new logics of operation, and that financial actors do not hold uncontested power over
- and privileged knowledge about – physical value chains, which remain marked by diverse
actors working at diverse sites and following diverse logics of practice. As such, while the “real”
and “abstract” economies of tangible production and financial markets are to a large extent
mutually constitutive, so too are there important disjunctures between these spheres of the
economy that call for greater attention.

References

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i See Franklin (2007); the potential economic costs of such an outbreak across all major American agricultural commodities have been estimated at approximately $200 billion across a 10-year fallout period (Pork Checkoff 2014, p.27)

ii On the Chinese hog industry see Schneider (2017).

iii A pseudonym. All names of interlocutors and interviewees – except for Dr. Robert Desrosiers, whose comments are public record – have been given pseudonyms.

iv Zaloom (2004) noted similar flippant attitudes among floor traders in the CME’s now-defunct open-outcry trading pits.

v Here I follow Beunza et al (2006) in defining the term broadly but also in accordance with market practice and the definitions used by market participants themselves, as opposed to using it in the sense implied by formal financial theory. As MacKenzie (2008, p.297) notes, in formal financial theory, arbitrage “generates riskless profit with no capital outlay,” a definition that is virtually untenable in practice, where some degree of risk and capital outlay, even if minimal, is generally necessary.

vi As a Chicago trader explained to me, the panic might have been profitable in either case, but in cases where hedged underliers are either actually deliverable or not manipulable at the biological level (like, for instance, sugar), low hedges can impose a profit ceiling.

vii It bears noting that Smithfield changed its reporting from the American May-April Fiscal year to a calendar year due to a takeover. But the statistics are similar comparing calendar 2014 to either calendar or fiscal 2013, suggesting a marked, one-time spike in profit.