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Co-evolutionary processes and positive feedbacks in the growth of the ultimate fighting championships

Ultimate
fighting
championships

31

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Abstract

Purpose – In the late 2000s, the Ultimate Fighting Championships (UFC) emerged to become the dominant mixed martial arts (MMA) organisation, bringing the sport to mainstream acceptance. The purpose of this paper is to draw on theories of co-evolution and positive feedbacks to provide insights into how the UFC has assumed this dominant position.

Design/methodology/approach – A single historical case study is compiled drawing on data from a number of sources, including the UFC, US State Athletic Commissions, MMA web sites and prior UFC-related academic literature.

Findings – A number of significant growth dynamics are identified, including interconnections between the increase in free-to-air events and the generation of new UFC fans and revenues; the increased financial rewards to successful fighters that allows them to improve the quality of their training and the improved quality of UFC content; and the accumulation of a critical mass of high-level fighters that increases the reputation of the UFC and the increased attraction of new fighters to the organisation.

Research limitations/implications – Further in depth studies are necessary to substantiate and quantify the interconnections identified in this paper.

Practical implications – The paper provides insights for other non-mainstream sports organisations that are attempting to grow their participation and viewership.

Originality/value – The emergence of new sports and sports organisations such as the UFC with global appeal and significant commercial returns is infrequent. This study contributes to the need for understanding of how new sports enter the mainstream and the role that governing organisations such as the UFC play in achieving this transition.

Keywords Growth, Emergence, Co-evolutionary processes, Mixed martial arts, Positive feedbacks, UFC

Paper type Research paper

Introduction

New sports that have global appeal and generate significant commercial returns do not appear often so the emergence of mixed martial arts (MMA) and its leading promoter the Ultimate Fighting Championships (UFC) is a significant occurrence. With historic roots in *pankration* and *vale tudo* (Bolelli, 2003), the sport found a North American audience when the UFC held its first event in November 1993. While further events followed, its growth was constrained by political concerns over the full contact nature of the sport, limiting its expansion in the mid to late 1990s. To overcome these constraints, a standard set of rules, the “Mixed Martial Arts Unified Rules of Conduct” was established in 2000, paving the way for regulated MMA events to be organised. However it was still some years before MMA and the UFC became widely popular.



The analysis in this paper covers what is considered to be the “modern age” of the UFC, the period after its acquisition by Zuffa LLC in January 2001 up to the end of 2010, to include events from UFC 30 to UFC 124. It is during this period that MMA grew from a minority interest sport that was illegal in the majority of US states to become a legitimate sport with mainstream appeal, and in which the UFC transformed itself from a loss-making enterprise to an organisation generating annual revenues in excess of \$500 million.

Drawing on insights developed from the study of technologies, organisations and industries in socio-economic systems, the growth of the UFC is analysed in terms of the co-evolutionary processes and positive feedbacks that operate within its business ecosystem. Building on this prior research and using publicly available data, allows us to theorise how the UFC has achieved its current position as the *de facto* monopoly of MMA. We begin by looking at the key concepts relating to co-evolutionary processes and positive feedbacks before analysing the UFC’s emergence and growth from this perspective.

Co-evolutionary processes in socio-economic systems

The simplest models of evolutionary change in socio-economic systems provide accounts in which the generation of variety and selection processes are central (e.g. Campbell, 1960). More substantive accounts also include further processes of retention (or inheritance), along with the conflict for resources (e.g. Ziman, 2000). Variety in socio-economic systems is generated by entrepreneurs and organisations that create new products, processes, markets and organisational forms through discovery and recombination (Schumpeter, 1928). Any variety generated is also subject to the prior history of the system, with novelty being a product of the existing structure of opportunities and constraints (Metcalf, 1998). These initial conditions can have a significant impact on the trajectory followed by a technology, firm or industry (Dosi, 1982; Malerba, 2007). However, variety is not generated blindly or randomly; consumer demand, competition and the allocation of investments operate as selection forces that shape progress (Nelson and Winter, 1982; Bijker and Law, 1992).

Agents and organisations are able to anticipate and respond to these market selection forces and adapt their strategies as a result of their learning (Axelrod and Cohen, 2000). These strategies may lead agents and organisations to manipulate their selection environments, a prime characteristic of entrepreneurs, who continue to learn and adapt through these experiences (Bhidé, 1994; Rycroft and Kash, 2004). Through this continual process of adaptation the selection environment shapes the development of innovations by entrepreneurs and firms, with the variety generated in turn shaping the selection environment (Hagedoorn, 1989). As March (1994) describes “[...] the convergence between an evolving unit and its environment is complicated by the fact that the environment is not only changing but changing partly as part of a process of coevolution. There is mutual adaptation between the unit of evolution and the environment” (p. 43). Consequently, those innovations and firms that are able to adapt to their selection environment have greater “fitness” and are retained; those that fail to adapt to the environment are eliminated (Saviotti, 1996; Metcalfe, 1998).

This co-evolutionary perspective has recently been applied so as to better understand the dynamics of industrial and technological change (Kauffman, 1995; Lewin *et al.*, 1999; Nelson, 1995; Ziman, 1999). It has given rise to the concept of the “business ecosystem”, the group of firms that interact and co-operate within a specific

industry for mutual benefit (Moore, 1996). The ecosystem members aim to drive institutional and technological co-evolution across the ecosystem in order to become the dominant business ecosystem. It aims to improve the attractiveness of the ecosystem to potential market entrants; joining a leading or rapidly growing ecosystem is more likely to yield financial returns than joining an ecosystem that has smaller market penetration or recognised growth potential (Iansiti and Levein, 2004). As such business ecosystems can be described as “complex adaptive systems”: dynamic systems of agents and organisations that experiment, explore, self-organise, learn and adapt to changes in their environment (Axelrod and Cohen, 2000).

Positive feedbacks in socio-economic systems

Research from complexity scholars on technological adoption provides insights into the significance of positive feedbacks in socio-economic systems. These studies have shown how variants are selected through a series of discrete transactions. As these transactions aggregate, the investments made and learning accumulated generate positive feedbacks, which in turn bring about increasing returns (David, 1985; Arthur, 1990).

Network effects are a specific type of positive feedback which operate when interoperability is important. Network effects represent the direct benefit to members of a network of being part of that network and increases as the number of members on that network increases (Katz and Shapiro, 1986). Such effects are operative in combinatorial networks where agents interact with one another, so increasing the value of the network through those interactions. Interaction and communication between users of a network are therefore critical to whether a technology exhibits network effects, particularly when there are incompatible rival systems (Shapiro and Varian, 1999).

In industries subject to network effects it is highly advantageous for firms to attempt to accumulate a “critical mass” of consumers or co-producers because the positive feedbacks increase switching costs and consumers and co-producers become locked-in (Arthur, 1989). Increasing returns are most apparent in knowledge-based industries where the cost of unit scale-up is almost negligible in comparison with start-up costs; this increases the attractiveness and necessity of early investment when competing in such industries so as to accumulate an installed base of customers, co-producers and complementary developers (Shapiro and Varian, 1999). The recognition of these effects leads to further positive feedbacks as expectations are developed of who will emerge as market leaders (Suarez, 2005).

The emergence of the UFC

The emergence of the UFC as a profitable sports organisation has been rapid and as Lim *et al.* (2010) comment, as a relatively recent phenomenon it has yet to be well documented in academic literature. Current papers focus primarily on the consumption of MMA by spectators (Kim *et al.*, 2008; Andrew *et al.*, 2009; Cheever, 2009; Lim *et al.*, 2010) rather than the wider issues of industrial dynamics and growth. However, these papers provide useful historical grounding on which to build and to which data can be supplemented from online sources. These include data directly from the UFC, (www.ufc.com), regulatory information from the Nevada State Athletic Commission (<http://boxing.nv.gov/>) and New Jersey State Athletic Control Board (www.nj.gov/oag/sacb/), and rankings and interview data from leading MMA news sites including

Sherdog (www.sherdog.com), MMA Junkie (<http://mmajunkie.com>) and Bloody Elbow (www.bloodyelbow.com). We draw on these in the analysis and discussion that follows. To set the scene for the analysis that follows, a brief recap is provided of the pre-acquisition years of the UFC and the early years of the UFC post-acquisition.

The UFC pre-Zuffa

While the very first UFC events in the early 1990s became very popular, growing to attract hundreds of thousands of PPV buys, the limited set of rules governing the actions of fighters competing led to criticism of the sport. This criticism was led by Senator John McCain, who used his political influence to help ban the sport in 36 US states. Along with restricting the location of where it could hold its events, the UFC also lost the support of major cable operators and suffered a significant loss of addressable audience (Plotz, 1999).

Recognising the damage of the ban, the UFC began to co-operate with the California and New Jersey State Athletic Commissions to develop rules that would improve fighter safety. This resulted in the “Mixed Martial Arts Unified Rules of Conduct”, a comprehensive set of rules that describe the conditions under which MMA fights can occur (NJSAC, 2002). UFC 28 on 17 November 2000 in Atlantic City, New Jersey was the first UFC event to subscribe to these rules.

However, despite the adoption of the unified rules, limited event revenues and PPV sales had pushed SEG close to bankruptcy and led to them advertising the sale of the UFC in late 2000. Shortly afterwards in January 2001, the UFC was acquired for \$2 million by Las Vegas-based Station Casinos owners Lorenzo and Frank Fertitta. They created Zuffa LLC as the parent company of the UFC and installed Dana White, a close friend and MMA manager, as President. The first event under the Zuffa ownership was UFC 30, held on 23 February in Atlantic City. This heralded the start of what is considered to be the “modern age” of the UFC.

Early Zuffa ownership: 2001-2005

As a former member of the Nevada State Athletic Commission, Frank Fertitta helped get the unified rules adopted in Nevada and opened up the opportunity to hold events in Las Vegas. The first such event was UFC 33 on 28 September 2001. The UFC management believed that PPV buyrates would pick up once they were carried by more cable operators. However, the majority of events organised during this period attracted buyrates of only 35,000-50,000 per show. The exception to this was UFC 40, which featured a much-hyped headline event between Ken Shamrock, one of the early UFC champions, and rising star Tito Ortiz. Held in Las Vegas on 22 November 2002, it was the first UFC event to generate a gate in excess of \$1 million and sold 150,000 PPVs. Yet the majority of events at this stage were loss-making and it is estimated that during the first four years of ownership, Zuffa accrued losses of \$33 million (Meltzer, 2008).

The year 2005 was a pivotal for the UFC. In the spring the first season of “*The Ultimate Fighter*” (TUF) reality TV show was aired on Spike TV. Broadcast over 12 weekly episodes, the premise for the show was the 16 fighters (eight middleweights and eight light heavyweights) would compete in tournaments to determine the best fighter in each division. The reward for winning their tournament was a “six-figure, three-year contract with the UFC”. The light heavyweight champion Randy Couture and Chuck Liddell served as coaches on the series, with the aim of the series also being

to provide these two fighters with greater public exposure prior to their planned fight at UFC 52.

The finals of the tournament were broadcast at *The Ultimate Fighter Finale* on Spike TV on 9 April 2005. The highlight of the event was the final of the light heavyweight category between Forrest Griffin and Stephan Bonnar. Significantly, the event attracted an audience of 2.6 million (Sherdog, 2005). The Griffin vs Bonnar fight has subsequently been described by Dana White as “the most important fight in UFC history” (Meltzer, 2008). Since that event the UFC has grown rapidly in terms of the number of events it has organised and the revenues it has generated, consolidating its position as the leading MMA organisation through the acquisition of competing organisations such as Pride FC, Strikeforce and World Extreme Cagefighting (WEC).

The growth of the UFC

Increasing the number of events and revenues

TUF proved to be a significant catalyst for growth, with the new audience translating into commercial success. A week after *The Ultimate Fighter Finale*, UFC 52 headlined by Randy Couture vs Chuck Liddell, set new UFC records for gate receipts (\$2.58 million) and PPV sales (280,000). Riding this new interest, the UFC began to promote a greater number of events. As can be seen from Figure 1, this increase has been significant. Between 2001 and 2004, the first four years of Zuffa ownership prior to the broadcast of *TUF* (2001-2004), the UFC organised 22 events. Then in the four years 2005-2008, 67 events were organised, with this continuing to grow to 102 events between 2009 and 2012. Official figures from the Nevada State Athletic Commission

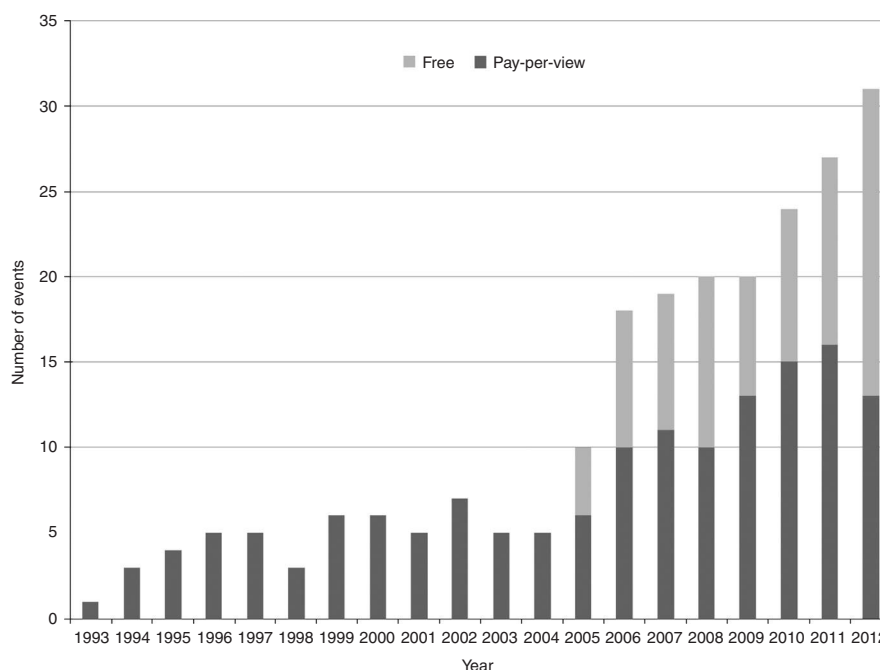


Figure 1.
The number of
pay-per-view and
free-to-air events
organised by the
UFC, 1993-2012

Source: www.ufc.com

give an indication of the rising popularity of the UFC, with gate receipts at Las Vegas-based PPV shows consistently generating in excess of \$2 million per event since the first season of *TUF* in 2005 (Figure 2).

Increasing free-to-air broadcasting

The ratings success of the first season of *TUF* and *The Ultimate Fighter Finale*, and the follow-on commercial success of UFC 52 prompted the UFC to broadcast further seasons of *TUF* and to increase the number of free-to-air events it organises. As Figure 1 shows, the number of free-to-air events have become a significant proportion of the UFC's product.

From 2005 to 2011, Spike TV was a key broadcast partner to the UFC and the events they have aired include three types:

- (1) season finales of *TUF*;
- (2) *Ultimate Fight Nights*; and
- (3) international events.

Since 2005, two seasons of *TUF* have been organised each year so that by the end of 2011, 14 season finales of *TUF* have been broadcast on Spike TV. The first *Ultimate Fight Night* was broadcast on 6 August 2005. By the end of 2010, 23 of these had been aired. From 2007 to 2011, ten international UFC events were broadcast on Spike TV. UFC programming on Spike TV also includes reruns of previous events, highlights programmes and promotional shows in the lead up to significant events. These include *Countdown to UFC* and *UFC Primetime*. The latter show has been used to focus in-depth on the lives and training regimes of headline fighters in the run-up to significant events.

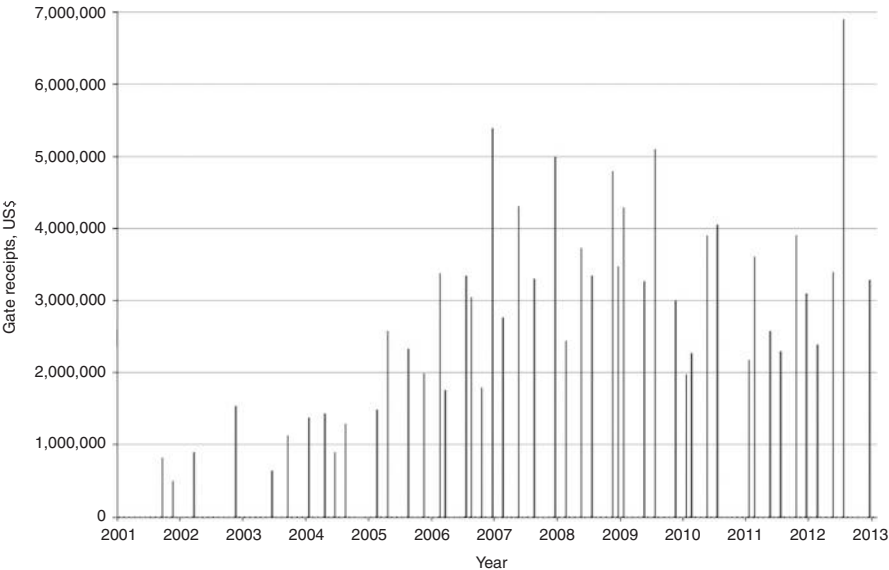


Figure 2.
Gate receipts from
UFC events held in
Las Vegas, NV

Sources: http://boxing.nv.gov/New_MMAGates.htm; <http://boxing.nv.gov/MMAGates.htm> via Internet Archive; <http://mmajunkie.com>

The UFC continued to expand its free programming in 2010 when it struck a deal with the Versus channel. This channel was already airing MMA through the WEC, another Zuffa-owned organisation that focused on the lighter weight classes. With the amalgamation of the WEC into the UFC in late 2010, the broadcast deal consolidated the partnership between Zuffa and Versus.

Along with whole events, the UFC and Spike TV began to broadcast selected preliminary bouts as lead-ins for PPV events; UFC 103 on 19 September 2009 was the first event where this occurred and this strategy has been regularly repeated. The UFC experimented with this strategy during 2011, broadcasting preliminary fights on Ion TV (UFC 125, UFC 127, UFC 140), streaming through its own web site (UFC 124) and on the UFC Facebook page. UFC Fight for the Troops 2 in January 2011 was the first event to stream some of the preliminary fights on the UFC's Facebook page, and has become an integral component to the lead-in of both PPV and free-to-air events.

August 2011 saw another landmark in the UFC's history as it announced a seven year partnership with the broadcast television network, Fox (UFC, 2011). This deal brought the previous partnerships with Spike TV and Versus to an end, but significantly increased the potential viewership on Fox's free-to-air channels (Fox, FX and Fuel TV), and expanding sponsorship opportunities. The first of these UFC on Fox events, a heavyweight title fight between Cain Velasquez and Junior Dos Santos set a new UFC record, with an average of 5.7 million viewers (Sandomir, 2011). By the close of 2012, a further four UFC on Fox events had been held featuring high profile fighters, with six UFC on FX events and six UFC on Fuel TV events. For PPV and UFC on Fox events, the UFC has shown portions of the preliminary cards on a combination of FX and Fuel TV, along with streaming fights on its Facebook page.

As an organisation that had faced extinction during the ban on MMA in the USA, the challenge facing the Zuffa owned UFC was how to grow from its "hardcore" roots and to bring in new fans from the mainstream. From an innovation diffusion perspective, the free-to-air programming improves this through increasing the trialability of the product (Rogers, 1995). The monetary cost of purchasing a PPV event is a significant barrier to consumption. However, the free-to-air broadcasting makes it possible for audiences to experience the UFC's product without these barriers. This has made it possible for viewers to develop an interest in the sport to the point of becoming fans and then attendees of UFC events and PPV customers. Along with traditional broadcasting channels, the UFC has embraced the internet as a distribution platform, streaming selected preliminary fights on a global basis through its Facebook page, along with providing on demand access to its archive of fights through its main web site.

An important dimension of becoming fans is the exposure that viewers gain from developing familiarity with fighters. *TUF*, the *Countdown to UFC* and *UFC Primetime* shows allow the audience to build affinity with the fighters, in the case of new fighters and the coaches in *TUF*, and with established fighters in the other two shows.

Geographic expansion of the UFC

Although the unified rules had been established at the time of the UFC's acquisition by Zuffa, MMA was still banned in the majority of US states. Lobbying has been required to overturn this ban with new markets slowly opening. Marc Ratner, a former member of the Nevada State Athletic Commission was recruited as the UFC's VP of Regulatory Affairs and has led this lobbying effort. Significantly, at the time of writing, the ban on

MMA remains in New York, despite efforts by the UFC to demonstrate the improvements to fighter safety that have been made and the economic benefits that hosting UFC events could bring to the state.

As a consequence of the ban in many states, the UFC relied on only a few states for hosting its events: Nevada, New Jersey, Connecticut, Louisiana, Florida and California. Of these, Nevada was its home market: of 49 UFC events held between 2001 and 2006, 31 of these were in Las Vegas, Nevada. Along with increasing the number of events that it has organised, the UFC has also increased the geographic diversity of locations in which these events have been held, both domestically and internationally (Figure 3).

The year 2007 marked a step-change, with the number of US states host to UFC events doubling and the UFC beginning its first meaningful foray into international markets. The first international market it targeted was Europe, with three events organised in the UK in 2007.. The first Canadian event was held in 2008 and it has proven to be a major market for the UFC. The first events in Ireland and Germany were held in 2009, while the UFC continued its international expansion with its first shows in Australia and UAE in 2010, in Brazil in 2011 and in China and Sweden in 2012.

When organising events in these countries, the UFC has tailored its fight cards, using a local main event fighter where possible and including a significant number of fighters from that region throughout the remainder of the fight card in order to engage with the local audience. For example, of the nine Brazilian events held, each main event has featured one or two prominent Brazilian fighters (e.g. Anderson Silva, Wanderlei Silva, Jose Aldo). The UFC has been able to do this due to the significant participation

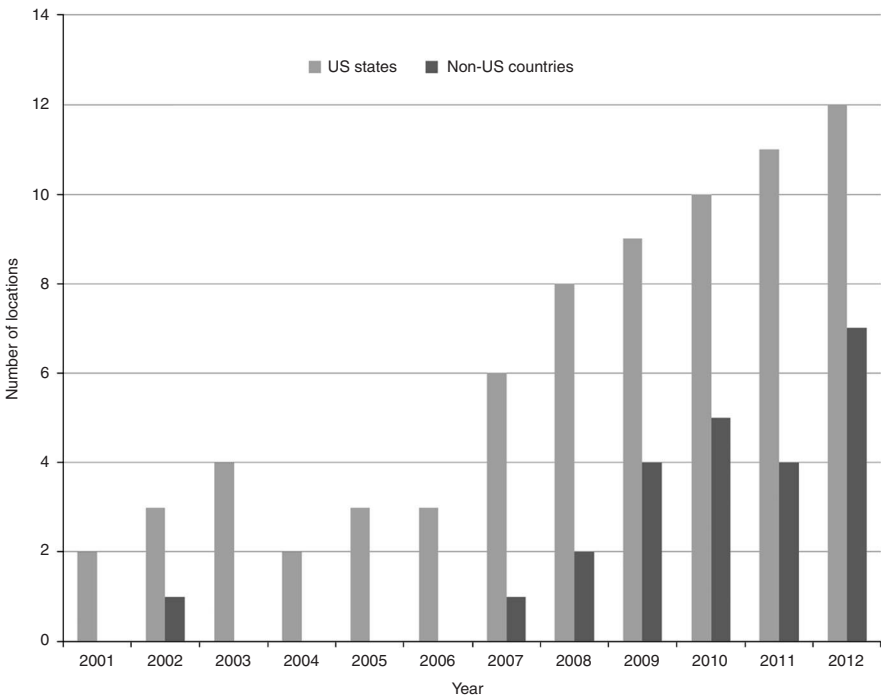


Figure 3.
The number of
locations in which
the UFC organised
events, 2001-2012

Source: www.ufc.com

of high-level Brazilian fighters. In contrast, there are far fewer high-level Canadian fighters, which has led to Canadian welterweight champion, George St Pierre headlining five of the 13 events, with none of main event fights of the other eight events featuring Canadian fighters.

Organising international events provided an additional problem: the time difference between the UK and the US resulted in poor pay-per-view figures for the first UK event. As a result, the UFC has offered future European-based events free-to-air on Spike TV. This decision was validated when the main event of the first free-to-air UK event that the UFC offered on Spike TV, UFC 75 on 8 September 2007, became (at that time) the most watched MMA bout in US history.

Building on the success of *TUF* in the USA as a means of introducing new fighters to audiences, in 2012 the UFC launched regional versions of the programme. The first, *TUF: Brazil*, capitalised on the large MMA talent pool in Brazil, while the second, *TUF: The Smashes*, featured competing teams from the UK and Australia.

While the UFC's attempts at internationalisation have largely been well received, they have not been without problems. MMA remains banned in France, while the first UFC event held in Germany, UFC 99, was opposed by city officials and only went ahead when the UFC voluntarily imposed a ban on the attendance of under 18s (O'Regan, 2009). The UFC returned to Germany in 2010 for UFC 122 despite being unable to secure a German TV deal. As Marc Ratner commented:

To grow the sport, you have to keep educating [...] We want to do business in Germany. We want to show the people and the newspaper people [...] that's the only way to do it. If you just walk away and say, "Gee, they won't let us be on TV," it doesn't make sense. So we're just going to keep pushing (Fowlkes, 2010).

Such education has been an important part of international expansion, particularly within traditional media and legislators. While in North America, MMA is overseen by athletic commissions, in many countries there are no such entities and the UFC has itself needed to act as a quasi-commission, ensuring fighter safety and conducting and enforcing drug testing.

The lobbying efforts of the UFC in the USA and in international markets represent entrepreneurial attempts by the UFC at shaping its selection environment, removing significant barriers to its propagation. It has been important to do so because reaching new domestic and international markets serves to widen the UFC's catchment area and increase its customer base, both for those attending events in person and for those watching the broadcast. These in turn improve the UFC's revenues from sales of tickets, PPVs and merchandise.

Furthermore, hosting international events helps build the UFC brand. In the USA, despite the presence of competitors, the UFC is synonymous with MMA and is often referred to as *Ultimate Fighting*, itself a Zuffa trademark. Being first to these international markets and gaining this same brand recognition creates a strong association between UFC and MMA and supports the protection of its intellectual property.

Roster management

As the UFC, a central premise of the UFC and its brand is that it is the premier MMA organisation and that its fighters are the best in the world. According to the *USA Today* SB Nation Consensus Rankings the UFC has increased its percentage of these elite fighters across the seven major MMA weight categories (Table I). Following the

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integration in 2010 of featherweight and bantamweight fighters from the WEC, the proportion of Top 20 ranked fighters surged from 42.9 to 70 per cent. This proportion continued to increase following the acquisition of the UFC's principal competitor, Strikeforce, in March 2011, with a notable increase in the number of heavyweight fighters.

Retaining and rewarding successful fighters. The fighters under contract to the UFC are its most important assets; accordingly, the UFC holds them to exclusive contracts that prevent them from competing for rival organisations. UFC fighter contracts are structured in such a way as to performance-related, rewarding those fighters that stimulate ticket and PPV sales. Fighters are paid a basic appearance fee, with an additional bonus paid for winning their fight. For lower-level fighters, this bonus is usually equal to that of the appearance fee but is more variable for higher profile fighters who are paid more (in excess of \$50k) and may receive a percentage of the lucrative PPV revenue. Those higher profile fighters that are able to stimulate ticket and pay-per-view purchases are termed "draws" for their ability to "draw in" this paying audience. With such a pay structure, the UFC is an attractive destination for MMA fighters in comparison to rival organisations, with the lowest basic appearance fees having increased significantly as the organisation's revenues have grown.

Eliminating unsuccessful fighters. While new UFC fighters are usually signed to multiple bout contracts, very few of these see out all of these fights because these contracts contain clauses that allow the UFC to terminate them should the fighter lose. Table I shows the records of 501 fighters who competed in the UFC between 2001 (UFC 30) and the end of 2012 (UFC 155) and who left the organisation. Of these 264 (52.7 per cent) left the UFC without a win, with a notable 146 (29.1 per cent) leaving after a single losing bout. In comparison, only 64 fighters (12.8 per cent) left the UFC with a winning record. Rather than having their UFC contracts terminated, the best records in this table belong to fighters who retired such as Matt Hughes (16-6), Chuck Liddell (13-6) and Kenny Florian (12-5).

Rewarding exciting fighters. In addition to the win bonuses built into the fighters' contracts, three bonuses, "Fight of the Night", "Knockout of the Night" and "Submission of the Night" have been awarded at each event since UFC 70 in April 2007. These bonuses are often several times greater than the basic appearance fee that a lower level fighter receives and are used to stimulate fighters into avoiding tentative performances and delivering exciting ones so that the attractiveness of the UFC product is maintained.

Table I.

The number of top
20 ranked fighters
under contract to
the UFC

	January 2010	January 2011	January 2012	January 2013
Heavyweight	9	11	15	17
Light heavyweight	17	15	16	16
Middleweight	10	14	13	15
Welterweight	14	16	17	17
Lightweight	10	14	16	15
Featherweight	0	12	15	15
Bantamweight	0	16	13	13
Total	60	98	105	108
%	42.9	70.0	75.0	77.1

Source: www.bloodyelbow.com/rankings

The need to deliver an attractive product to its customers also motivates the UFC to retain those fighters that deliver exciting performances. From UFC 70 to UFC 155, 549 of these event bonuses have been awarded. Table II provides figures on the numbers of fighters receiving these and the number of fighters that have been released.

These figures illustrate that fighters who provide a bout of high quality, judged either in terms of the whole bout excitement ("Fight of the Night") or in the finish to the fight ("Knockout of the Night" and "Submission of the Night"), and receive event bonuses, are much more likely to be retained by the UFC than those who do not win event bonuses. Of the fighters who did not receive an event bonus 73.1 per cent were released, while only 38.6 per cent of fighters who received a single event bonus were released. Exciting fighting styles are therefore promoted, leading to entertaining fighters being retained and matched with other exciting fighters.

Creating main event fighters

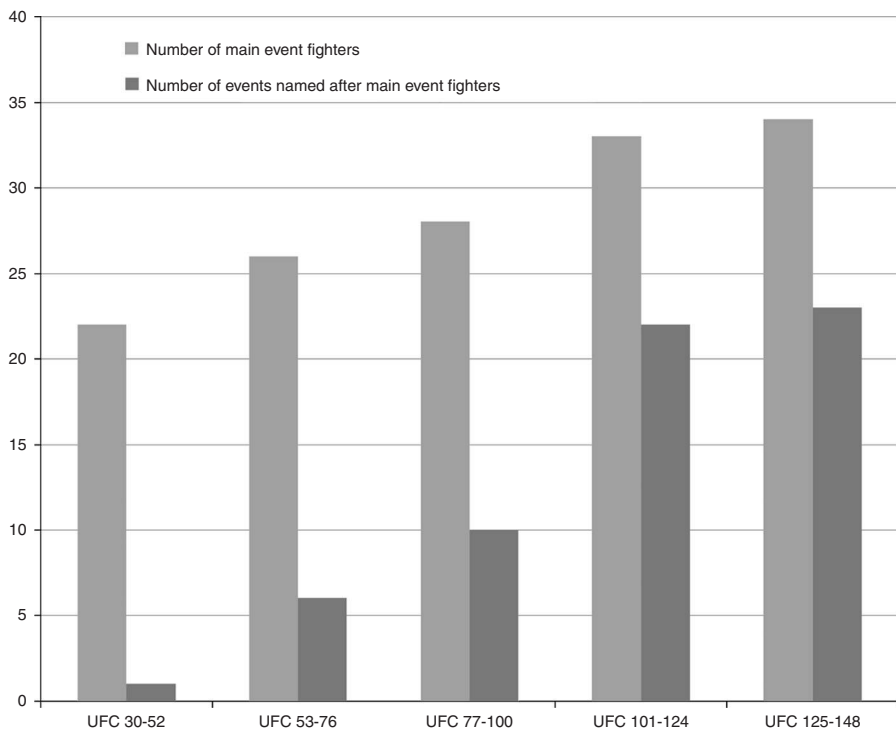
As sports entertainment, the UFC's fanbase has to be convinced to pay for the PPV. One feature of selling the event to its customers is to build up main event fighters, also known as headliners or draws. These are fighters that will feature in the event's main event and around which the UFC's pre-event promotional marketing will be based.

Examination of the main event fighters of main numbered events shows that the UFC has steadily increased the diversity. Figure 4 shows this, dividing the 120 UFC events since the start of 2001 into five groups each of 24 events. In the first period, UFC 30-52, the organisation was heavily dependent on two headliners, Randy Couture and Tito Ortiz, who appeared in nine and eight main events respectively, 35.4 per cent of all headlining spots. This dependency is now less apparent. The most frequently appearing main event fighter appeared in the second period was Chuck Liddell (six main events); in the third period it was Rashad Evans, Anderson Silva and

	Losses									
	0	1	2	3	4	5	6	7	8	9
<i>Wins</i>										
0	1	146	88	26	3					
1	7	28	46	17	6	1	1			
2	1	6	10	14	5	5	1	1		
3		3	5	8	7	3	1	1		
4		2	2	5	4	6	2			
5			1	1	3	3				
6			1	1	1	2		1	1	
7				1	1	1	1	1		
8				1	2		2	1		
9					2		1	1	1	
10						1				2
11							1	1		
12						1				
13							1			
14										
15										
16							1			

Source: www.ufc.com

Table II.
The win-loss record
of the 501 fighters
who exited the UFC
between the start of
2001 and end
of 2012



Source: www.ufc.com

Figure 4.
Main event fighters
in the UFC in selected
time periods,
2001-2012

Georges St Pierre (four main events); in the fourth period it was Randy Couture, Lyoto Machida and BJ Penn (three main events); and in the fifth period it was Jon Jones (four main events) and Anderson Silva and Frankie Edgar (three main events). A driver for this is the combination of increasing frequency of UFC events and the limitation on the frequency with which main event fighters can compete.

The success of early seasons of *TUF* can also be measured in terms of the number of main event fighters it has generated. Forrest Griffin and Diego Sanchez (Season 1), Rashad Evans and Joe Stevenson (Season 2), Michael Bisping (Season 3) and Matt Serra (Season 4) have all featured in multiple main events, as have a number of other competitors from the early seasons of the show.

At the same time, the UFC has used fan recognition of these main event fighters to name its events. As Figure 4 shows, from UFC 30-52, only one event was named after the main event fighters (UFC 52: Couture vs Liddell 2). This increased to 6 events between UFC 53-76 (4 of which featured then light heavyweight champion Chuck Liddell), then ten events between UFC 77-100. Since UFC 101-124, naming the event after the main event fighters has become the norm, with 22 of the 24 events doing so. UFC 125 was the last event where the main event fighters' names were not used. This greater diversity means less dependency on the drawing power of a small number of fighters and also places greater responsibility on the main event fighters to become co-promoters of the event.

Discussion

Positive feedbacks

A number of positive feedbacks exist between the UFC, its fighters, and other members of its business ecosystem, which produce co-evolution between these stakeholders. Parallels can be drawn between interactive platform technologies and the UFC because each is subject to network effects. Interactive technologies only gain value if there are large number of producers supporting the development of the platform and complementary products. There is increasing returns to production. The classic examples here are video storage standards battles: VHS vs Betamax and Blu-ray vs HD-DVD. The same is true in the UFC, where it provides the core platform – its events – and the fighters are co-producers of these events, providing the content. Neither can operate without the other; the UFC's part of the bargain is to provide attractive matchmaking and event promotion, while the fighters must generate compelling entertainment. It is this co-dependency that drives the current co-evolution of the UFC and its fighters.

Over time the UFC has been able to increase its percentage of the best MMA fighters in the world, building up a critical mass of high-level talent that acts as an attractor for other upcoming fighters who aspire to be the best (Table I). The perception that the UFC employs the best fighters is reinforced when established UFC fighters win against highly ranked new entrants to the UFC, affecting the judgements of observers conducting MMA rankings and audiences alike.

While there have been competitors to the UFC, these have either gone out of business (e.g. EliteXC, Affliction), or acquired by the UFC (e.g. Pride FC, Strikeforce). The UFC's dominant position in securing the services of the best MMA fighters under exclusive contracts makes it difficult for rivals to attempt to enter the market. It also increases the switching costs for fighters considering leaving the organisation because these acquisitions reduce the number of opportunities for fighters outside the UFC. In 2013, the main competition to the UFC are Bellator and World Series of Fighting, with both offering lower financial rewards in terms of both basic pay and sponsorship.

The financial attraction of the UFC. As the UFC has put on a greater number of events, improving its revenues from sales of tickets, broadcasting and merchandise, it has been able to increase its financial rewards to its fighters. In addition, the increase in the UFC's popularity and audience also improves sponsorship opportunities for fighters, and has accelerated since the UFC agreed its broadcast deal with Fox. These increases in income from the UFC and sponsors means that fighters are able to dedicate more time to their training and to afford better quality training. The improvements to the quantity and quality of training lead to the fighter's improving their MMA skills, which in turn leads to an increase in the quality of the content of UFC events.

The increase in financial rewards also increases the UFC's attractiveness to fighters outside the UFC. The remuneration has reached the point where it is possible for fighters to pursue a full-time MMA career and has also started to attract athletes from other disciplines. While there is a natural progression for college wrestlers and practitioners of martial arts to develop their skills beyond their base, ex-NFL footballers and the most famous UFC recruit of recent years, Brock Lesnar, a former professional wrestler in the WWE, have also been attracted to the UFC.

The attraction of training camps and gyms. The need for fighters to improve their MMA skills has led to the emergence of a number of training camps and gyms where clusters of fighters train together. Examples of such training camps include Jackson's

MMA, American Top Team, Black House, Xtreme Couture and American Kickboxing Academy. These training camps have risen to prominence through their association with successful UFC fighters. As MMA has become more professionalised, these camps act as attractors for fighters wishing to evolve their skills and to learn from the coaches that have had previous success developing fighters. They are analogous to Marshallian technology clusters in that they provide increased knowledge flows (of training techniques), and reduce the search and transaction costs of accessing this knowledge (He and Fallah, 2011).

Many of these training camps also have gyms that offer training to novices and intermediate martial artists. The growing popularity of MMA has led to an expansion in the number of gyms offering MMA training in order to satisfy the desire from the UFC's audience to also practice the sport they consume. Current and ex-fighters use their profile and experience to open their gyms, while the UFC itself has also opened its own gyms (www.ufcgym.com) in partnership with New Evolution Ventures. Participating in MMA represents a further positive feedback to the fan's interest in MMA and the UFC, improving the access to the sport and develops the next generations of MMA fighters.

Fighters shaping their selection environment

As was noted earlier, co-evolutionary processes in socio-economic systems are not blind; agents and organisations anticipate and respond to selection forces, adapt their strategies as a result of their learning and manipulate their selection environments. This is true of fighters in the UFC, who improve their selection "fitness" both in terms of their athletic performance through training, the excitement their fights generate and their own promotional efforts. The capacity of a fighter to improve their selection fitness through improvement to their physical ability is self-evident; accordingly, we consider their ability to shape their selection environment through exciting fights and self-promotion.

Exciting fighters. As MMA becomes more professional and the financial risks of losing become more serious, there becomes the possibility that fighters will become more risk averse and that fights will become less entertaining. We have already seen that the UFC uses event bonuses to counter this problem and that it retains fighters who deliver exciting fights. One example of such a fighter is Chris Lytle, who at one point in his UFC career had a record of 2-6 before improving to 9-9 at the end of 2010.

In his 18 fights in the UFC, Lytle has won seven event bonuses: four "Fight of the Night", two "Submission of the Night" and one "Knockout of the Night" bonuses. Speaking after his bout at UFC 119, Lytle stated:

I'm not willing to [employ] a win-at-all-costs mentality. If it's going to be a boring fight, I'd rather go out there right now and fight the best fight of my life and lose a decision than fight the worst one and win one [...] I'm trying to win the right way, and I think they'll reward that if I keep doing that (Stupp, 2010).

As the figures in Table III illustrated, the UFC rewards such a strategy and consistently putting on exciting fights ensures that the fighter is retained by the UFC.

Self-promotion. Improving their marketability through self-promotion is another mechanism through which fighters can improve their position in the UFC. This was epitomised in the early Zuffa years by Tito Ortiz, the light heavyweight champion from 2000 to 2003, whose self-promotion made fans want to watch his fights either to see him

Table III.
The number of event
bonuses received
between UFC 70 and
UFC 155

Number of bonuses received	Number of fighters	Number of fighters who exited the UFC
0	579	423
1	132	51
2	69	13
3	25	6
4	19	3
5	14	3
6	2	0
7	1	0
8	0	0
9	1	0
10	3	1

Source: www.mmajunkie.com

win or lose. In the build up to his fights, Ortiz would frequently engage in “trash talking” in order to generate wider interest. Such a strategy has become a frequent component in the build-up to UFC events. For example, in 2010 the most notable instances were Quentin “Rampage” Jackson vs Rashad Evans at UFC 114, Chael Sonnen in the build up to his title fight against Anderson Silva at UFC 117 and Josh Koscheck as coach on the 12th season of *TUF* in the build up to his title fight against Georges St Pierre at UFC 124.

As a commercial enterprise, the UFC needs their main event fighters to help sell the fights. The failure to engage with the fanbase effectively can lead to limited main event and title opportunities. Effective self-promotion can accelerate the path to such opportunities; when Brock Lesnar joined the UFC he brought with him a large professional wrestling fanbase and knowledge of how to promote themselves. Away from MMA, a number of fighters have branched out into films, with the most high-profile roles to date being those of Quentin “Rampage” Jackson in *The A-Team* and of UFC Hall of Famer Randy Couture in *The Expendables*. Extending their presence through these other media channels improves the visibility of the fighter and of the UFC.

In a similar vein to how it uses fight bonuses to encourage exciting fights, in November 2011 the UFC introduced a series of quarterly Twitter bonuses to encourage its fighters to engage directly with its fanbase. These bonuses were awarded to those fighters with the most followers, the largest percentage increase that quarter, and the most creative tweets (MMAjunkie, 2011). This further illustrates how the UFC uses an existing platform (i.e. Twitter) to engage and interact with its audience, and uses financial incentives to shape the behaviours of its fighters.

Conclusions

The focus of this paper’s analysis and discussion has been the co-evolutionary processes between the UFC and its fighters, and the numerous positive feedbacks that exist between them and other stakeholders in the UFC business ecosystem (including fans, broadcast partners, sponsors and training camps).

Improving access to its content and raising the profile of its fighters have been central components in the transformation of the UFC into a profitable organisation. The UFC has built on the catalyst of the first season of *TUF* in 2005, using its improved

revenues from sales of tickets, PPVs and merchandise to increase the number of free-to-air events and to expand its geographic catchment, exposing its product to a larger audience and creating new fans and consumers.

It has also developed a roster management system whereby successful and exciting MMA fighters are retained, with these fighters receiving greater financial rewards that allow them to improve the quality of their training. This in turn improves the quality of the UFC content. The combination of this improved quality and the increasing familiarity that fans gain from greater exposure to these fighters then increases their consumption of UFC events. Furthermore, the acquisition and retention of successful fighters has also allowed the UFC to accumulate a critical mass of fighters whereby it becomes the most attractive organisation. Now exhibiting strong switching costs, this reinforces the UFC's position as the premier MMA organisation and allows it to recruit the most talented new MMA fighters.

However, fighters recruited to the UFC are not passively subject to this selection environment but adapt their strategies, in some instances by generating exciting bouts and in others by raising their public profile through promotional efforts. The use of bonuses as a financial incentive illustrates how the UFC recognises the danger that too many fighters could pursue a "safety-first" policy when competing that could alienate its customers/fanbase. This tension between the UFC's need to provide an entertaining product that its customers are willing to purchase and the integrity of the sport is ongoing and is one of the great distinctions between the UFC and other sports where win-at-all-costs mentalities are more widely accepted. The continued evolution of the UFC will depend on managing this tension and perpetuating the positive feedbacks that it has already established.

As the UFC continues its international expansion, its lobbying and education efforts must continue to overcome bans on MMA in regions such as New York State and France, and to improve mainstream acceptance of its product. The Fox broadcast deal was a significant step towards mainstream acceptance in the USA, while the endorsement of blue chip sports apparel sponsors such as Nike and Under Armour is helping to further legitimise the sport. The use of existing platforms such as Facebook and Twitter provides the UFC with a global shop window, allowing region-free consumption and engagement with its audience and helping the UFC identify those markets where there is demand for its events. Managing this demand will be another major challenge; as the number of international events expands, the UFC must carefully manage its roster to ensure that it cultivates fighters that appeal to these new markets while at the same time avoiding the dilution of its product.

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