Evading labour market regulations to preserve team performance: Evidence from the Victorian Football League, 1930-70

Sports teams that seek to maximise the number of wins, rather than profits, may not comply with league labour market regulations that compress payroll structures to promote even competition. This strategic behaviour depends on others, as teams choose a strategy to create team incentives, to which rivals will respond. A case study of four teams in a semi-professional Australian Rules football league tests the effectiveness of strategies to evade these regulations on winning percentages. Both compliance and non-compliance within this labour market regulation regime, based on different wage structures and talent distribution, were effective strategies to improve team performance.

Keywords: Labour market regulation; strategic behaviour; pay differentials; team incentives

Introduction

Sports leagues differ from typical firms in that while individual firms (teams) attempt to win all of their games, leagues as a collective often try to handicap the better teams to moderate their winning percentage to improve competitive balance – a more equal distribution of winning percentages. This conflict of objectives arises from the observation that league profits increase if matches are contested more evenly, due to a direct relationship between attendances and the uncertainty of match outcomes.[1] Leagues have used a variety of tools to reduce labour costs and limit the ability of teams to outperform, including labour market regulation (reserve clauses, recruiting zones, and salary caps to regulate player recruitment, mobility and wages) and restrictions on profits (sharing of gate and league revenues), to

[1] Neale, "The Peculiar Economics."

restrict the predictable flow of talented players towards the top teams.[2] Such rules are also consistent with the principles of amateur sport, in which winning is ostensibly not an objective, and players bear all of the costs of participation. In professional 'sportsman' leagues, owners are willing to sacrifice profits to maximise the number of wins, and invest as much as they can in playing talent subject to a breakeven constraint. Such teams may operate under a 'soft' budget constraint, with debts being absorbed by wealthy owners and other stakeholders, and incur persistent losses without going out of business.[3] Compared to their profit-maximising counterparts, win-maximising team owners are more likely to overspend on players, and to game labour market regulations by defecting to preserve team performance.[4] This paper tests the hypothesis that match outcomes in sportsman leagues will be affected by the strategic behaviour of the participants in choosing whether to comply with labour market regulations, through a case study from Australian Rules football, based on analysis of matches between teams that chose to evade an individual salary cap and those that chose to comply.

Much of the literature addressing questions relating to labour market regulation relates to North American leagues, where privately-owned profit-maximising teams operate in closed leagues, with territorial monopolies.[5] However, in terms of the business model of professional sports worldwide, the North American experience is a modern outlier. Outside North America, sportsman leagues are the norm. Cricket, tennis, golf and the various forms of football were not established as commercial enterprises, and clubs, established to allow

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[2] A reserve clause to contain the growth of player salaries was introduced in 1879 by Baseball's National League, itself formed in 1876 to increase the profits of the game's leading teams. When the English Football League was established in 1888, its rules included a retain-and-transfer system that allowed clubs to deny players permission to transfer to other clubs, which was likely to have been modelled on the reserve clause. Szymanksi and Zimbalist, *National Pastime*.

[3] Storm and Nielsen, "Soft Budget Constraints."

[4] Vrooman, "Sportsman Leagues." Sloane, "The Economics of Professional Football" is the seminal work on utility (and win) maximization as an objective of owners in professional sports. For a recent overview of the literature, see Fort, "Managerial Objectives."

[5] Szymanski and Zimbalist, *National Pastime*.

fee-paying members to play, were the organisational foundation of sports at the elite and grass roots level. Clubs are 'owned' by their members, who elect a (usually volunteer) committee to handle administrative matters. Until the 1980s, a 'peculiar patchwork' of amateurism and professionalism characterised British sport.[6] For example, professionals and amateurs could play in the same teams in cricket, but not rugby. Professional soccer clubs employed semi-professional players who held jobs outside of football.

In sports leagues where institutional arrangements span amateurism to semi-professionalism, the range of salaries can extend from zero to players being paid an amount equal to their marginal revenue product. Pay differentials can extend from equal pay for all team members to one player being paid the entire wage fund. For teams, labour market regulations are exogenously given, but decisions about compliance with these regulations, and the hiring of players in general, are made by individual clubs, and thus determined endogenously. Labour market regulation, to prevent players from selling their labour to the highest bidder, was attractive both to administrators who were guardians of their sport's amateur traditions, and clubs that were concerned that their leagues would be dominated by clubs from the larger cities. By the early twentieth century, the English Football League had set an individual salary cap, or maximum wage.[7] In practice, clubs were able to conceal player payments, and thus choose the extent to which they complied with the maximum wage. Most players were paid less than the maximum wage, and wealthy clubs found ways to evade the regulations to recruit and retain high-quality players.[8] Existing studies focus on how the maximum wage affected the incomes of English footballers, but do not consider the effects of variations in compliance on team performance.[9]

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[6] Holt and Mason, *Sport in Britain*, 36.
[7] Vamplew, *Pay Up*; Harding, *For the Good of the Game*.
[8] Vamplew et al., "Playing for Pay."
[9] See for example Vamplew et al., "Playing for Pay;" Taylor, *The Leaguers*.

Compliance strategies, based on strategic decisions about the most appropriate way to structure rewards to maximise team productivity, are made in labour markets that allow for multiple equilibria. Driskill and Vrooman model a 'reverse-L' shaped talent supply function that is initially perfectly elastic and approaches perfect inelasticity at its limit. When a maximum wage is set along the perfectly elastic segment of the supply curve, complying team owners are price takers who hire at a constant marginal cost, with players paid a reservation wage that is sufficient to attract those who are willing to play at this wage or less. In this model, the supply function becomes perfectly inelastic, as players with a higher opportunity cost seek a higher wage to enter the market.[10] A club that evades the regulations can attract players from the perfectly inelastic segment of the supply curve whose reservation wage is above the maximum and prevent the loss of quality players, with its talent choices now impacting on those of rivals.

Analysis of compliance strategies thus incorporates game-theoretic elements, as prior to any match, each team will have chosen a recruiting and player payment strategy in the context of labour market regulations that limit player salaries and mobility, to which it's rival will have chosen how to respond. For both teams, the preferred outcome is to win the match, and the effectiveness of a compliance strategy will help to determine whether the payoffs – the utility derived from winning matches – are as expected. If team owners think strategically about how rivals will respond to a choice of action, drawing on previous interactions and shared knowledge to place themselves in the minds of their rivals and infer others' motivations, they may be able to devise creative manipulations of outcomes, to improve their winning percentage.[11] In doing so, non-complying clubs will be thinking strategically, anticipating that rival clubs will continue to comply. A complying club that takes a non-

[10] Driskill and Vrooman, "It's Not Over."
[11] Chwe, *Jane Austen*, p. 7.

strategic, or 'clueless' view of the situation, without thinking of how rivals will react to its actions, may consider its status and prestige to be sufficient to attract and retain talent.[12] However, compliance with the monetary elements of labour market regulation may not reflect a total lack of strategic thinking, as the provision of non-wage benefits to enhance natural prestige, such as drawing on supporter networks to assist players in finding employment outside of football, may be offered to counter the cash offers of non-complying clubs.

Like American football, Australian Rules football evolved in isolation and is played at the elite level in only one country. Almost all Australian Rules leagues are closed, with no promotion-and-relegation. Clubs are not-for-profit, member-based associations. From 1930-70, the code's major league, the semi-professional 12-club Victorian Football League (VFL), set an individual salary cap and prohibited the payment of signing-on fees. Empirical testing of the effects of strategies to evade these regulations is difficult because data on the individual wage paid to each player is not available in financial statements, and evidence of non-compliance is hidden by the chicanery of club owners. This creates challenges for our study, but we draw on several sources to obtain evidence about compliance strategies over the 40-year period that these regulations operated, including interviews with players, written testimony from players and club officials, press reports, and club histories. We consider matches involving the League's four strongest-drawing clubs, of which evidence identifies two that complied (Collingwood and Melbourne) and two that did not (Carlton and Richmond). We select these clubs for analysis because their compliance strategies were maintained consistently over the sample period, and so may be considered to be time-invariant. Other League clubs complied intermittently, according to changes in their budget constraint.

[12] Chwe, *Jane Austen*.

A case study based on the strategic behaviour of sports teams overcomes many of the empirical challenges presented in analysing the relationship between talent distribution, incentives and pay differentials, and firm productivity.[13] Every match is a joint product, with rules specifying that two teams participate, thus removing any potential self-selection bias from firms choosing to form teams. Because individual production is not allowed, clubs have no choice but to field teams for any match, which avoids issues of adverse selection. Identification of the variables that affected winning percentages and the payoffs from compliance and non-compliance with labour market regulations allows us to assess how strategic thinking about wage structures benefited the successful clubs in a closed league. To our knowledge, this is the first study that considers the effects of endogenous firm choices about talent distribution and wage structures on team performance, when output is a joint product, based on a zero-sum interaction with another firm, some of which will have followed one strategy, and some the opposite. Our four sample clubs made up 33 per cent of all League clubs, but won 61 per cent of premierships during the sample period. Our results suggest that while evading labour market regulations allowed two of the sample clubs to preserve team performance in league matches in general, the two complying clubs were able to achieve a similar result by strategic use of non-wage benefits associated with tradition and prestige. In matches between the sample clubs, the closeness of winning percentages suggest that both strategies were effective in preserving team performance.

Economic theories of sportsman leagues and team incentives

In the Quirk and Fort model of labour market equilibrium in a two-team, profit-maximising league, winning percent is a function of the size of each team's market, or supporter base, and

[13] Hamilton et al., "Team Incentives and Worker Heterogeneity."

thus the amount of revenue that can be invested in playing talent.[14] The league is closed, and if owners are free to bid for each other's players, they will do so until the marginal revenue from a winning percent is equal for each team. At this winning percent equilibrium, the market is cleared, with marginal revenue equalling marginal cost for both teams, and both teams facing the same price of talent. Winning percents sum to 100, with the larger market team having the higher win percent, and the higher total payroll. A reserve clause changes the distribution of playing strengths and winning percentages between teams by reducing the marginal cost of talent to below the market-clearing level. Revenue disparity will encourage teams to continue buying and selling players for cash, until the competitive winning percent equilibrium is reached.[15]

A sportsman team's demand curve for talent is given by its average revenue curve because all revenue is spent on playing talent up to the breakeven point where total revenue equals total cost. If a team's budget constraint is soft, spending may continue beyond this point. Owners spend beyond the profit-maximising level on players, ignoring the negative externalities associated with reduced competitive balance. In a two-team model, win-maximising teams will hire up to the point at which their average revenue curves intersect, at which wage costs are higher and the competition is less competitively balanced than if teams were profit-maximisers.[16] If teams have sufficient funds to engage in a recruiting arms race, the aggregate level of talent may become inefficiently high, with players being over-valued and competitive balance reduced. Owners fail to maximise the joint value of their franchises, creating what Vrooman calls a 'sportsman effect'.[17]

[14] Quirk and Fort, *Pay Dirt*.
[15] Quirk and El-Hodiri, "The Economic Theory."
[16] Késenne, "The Impact of Salary Caps."
[17] Vrooman, "Sportsman Leagues."

Salary caps may counteract the sportsman effect by rationing the supply of top players, if the demand for talent at the capped wage exceeds supply. As caps force strong-drawing teams to cut back on player payments, and the lower per-unit cost of talent encourages weak-drawing teams to hire more talent, an increase in the winning percentage of weak-drawing teams at the expense of strong-drawing ones is likely, thus improving competitive balance.[18] However, if it is possible for sportsman owners to avoid salary cap rules, an equilibrium based on an agreed level of investment in playing talent is unlikely to be sustained.[19]

In workplaces where teams draw on complementary skills, structures based on similar levels of talent, rewarded by team-based incentives such as equal pay, tend to increase productivity. Where teams rely less on complementary skills, a more heterogeneous mix of talent may be optimal, as pay differentials provide incentives for greater effort from team members with higher skills.[20] Empirical work on the effects of pay dispersion on team performance has produced varying results, with the impact of efficiency wage models – where some workers are paid above the market-clearing wage – being highly sensitive to the nature of the sport. Hierarchical pay structures provide optimal team performance in basketball, where team size is small and efficiency wages induces higher performance from players whose level of effort has high 'damage potential' for team productivity.[21] The payment of disproportionate wages to highly productive athletes may generate a 'superstar' effect through positive externalities such as increased gate and broadcast rights revenue, which increase the potential team payroll.[22] Where teamwork is needed to complete tasks, pay differentials may result in workers at the tail end of the talent distribution withholding

[18] Dietl, Lang and Rathke, "The Combined Effect."
[19] Dietl, Franck and Lang, "Overinvestment."
[20] Prat, "Should a Team be Homogeneous?" Hamilton et al., "Team Incentives and Worker Heterogeneity."
[21] Halevy et al., "When Hierarchy Wins;" Ramaswamy and Rowthorn, "Efficiency Wages."
[22] Kuethe and Motamed, "Returns to Stardom."

effort if they perceive that they have not been paid a 'fair' wage.[23] Data from Major League Baseball from 1985 to 2002 supports this 'fairness' hypothesis, with greater wage disparity reducing overall team performance.[24] Team productivity is also affected by the degree of interaction between team members, which moderates the impact of talent distribution.[25] On the one hand, if team tasks are complementary, with the roles of players coordinated, a cohesive team of homogenous talent, reinforced through low pay dispersion, is likely to have a positive effect on winning percentages. On the other hand, teams with a heterogeneous distribution of talent may benefit from able team members teaching skills to less able ones, and raising overall standards of preparation and performance through peer pressure.[26] This explains Franck and Nüesch's finding that in the German *Bundesliga*, the relationship between wage dispersion and team performance is nonlinear, with teams performing strongly when wage inequality is either very high or very low.[27]

VFL clubs and labour market regulation

Australian Rules evolved from football games played on the parklands of Melbourne shortly after the gold rush of the 1850s.[28] After its rules were codified in 1859, clubs and leagues were formed throughout Victoria, South Australia, Tasmania, Western Australia, and the Riverina region of southern New South Wales. As in British (Association and Rugby) football, Australian Rules football clubs were founded by middle-class sports enthusiasts, but drew revenue from spectators who were willing to pay to watch matches. Clubs were 'owned' by members who paid an annual subscription fee, and derived utility from watching their teams win matches. The Victorian Football Association (VFA) was established in 1877

[23] Akerlof and Yellen, "The Fair Wage-Effort Hypothesis;" Levine, "Cohesiveness, Productivity;"
[24] Depken, "Wage Disparity;" Jewell and Molina, "Productive Efficiency."
[25] Franck and Nüesch, "The Effect of Talent Disparity."
[26] Hamilton et al., "Team Incentives."
[27] Franck and Nüesch, "The Effect of Wage Dispersion."
[28] Blainey, *A Game of Our Own*.

to reduce uncertainty about rules and match conditions, adopting a retain-and-transfer system that required players to obtain a 'clearance' from their current club and association to transfer to another club.[29] By the start of the twentieth century, the VFL had been formed, after the VFA's leading clubs broke away to avoid playing matches against weaker teams.[30] A not-for-profit organisation owned by its affiliated clubs, the VFL was until 1985 administered by a board, made of two delegates appointed by each club. The Board only had the authority to act on possible breaches of League rules if a three-quarters majority of club delegates voted to do so. Delegates tended to put the interests of their own clubs ahead of the objectives of the League in general, and central control of club activities was weak.

Games of Australian Rules football are played between teams of 18 interacting players. The large number of players on the field and the importance of teamwork reduce the likelihood that a single player will be crucial to team performance. During the sample period, there was no formal limit to the size of playing squads, and players were allowed to transfer during the season with their club's permission, prior to a cut-off date. Most new players came from minor leagues, many inviting themselves to pre-season try outs before training lists were finalised; most exited by retiring from the game or moving back to minor leagues.[31]

Payment of players was illegal prior to 1911, but most VFL clubs compensated high-quality players for the time they took off work to play and attend training.[32] In 1915, the VFL allocated specific recruiting zones within metropolitan Melbourne to each club, so that the issue of which club a player joined would be decided by where he lived, rather than money. Players who lived outside the Melbourne metropolitan area were free agents. At the onset of the Great Depression, a disparity in the financial resources of VFL clubs was apparent. In

[29] Pennings, *Origins of Australian Football*.
[30] All VFL clubs were based in Melbourne, except one in Geelong. The VFA admitted new teams and continued to operate as a Melbourne-based league in its own right.
[31] Of the players who left the four sample clubs during the sample period, only 17.8 per cent moved to another VFL club.
[32] Halabi et al., "Legitimising Amateur Status."

1929, Carlton paid its players £5 15/- per match; Collingwood and Richmond £3 per match.[33] Average attendances at home-and-away games fell from 17,300 in 1928 to 14,800 in 1931 as football fans faced tighter budget constraints, with smaller clubs being most affected.[34] The VFL set uniform admission charges, with net gate receipts split three ways between the participating clubs and the ground controller (usually a local council or cricket club). However, clubs with large followings were advantaged by members being admitted free of charge to home and away games, and by the home team retaining all of the higher admission charge from entry to the grandstand reserve. From home games against Carlton in 1929, Hawthorn's share of gate receipts was £26 (from a crowd of 6000), while Collingwood received £222 (from a crowd of 33,000).[35] By 1930, Hawthorn, along with Melbourne, could not afford to pay its players at all.[36]

In 1930, in an attempt to stabilise the financial position of clubs, the VFL introduced a set of regulations that became known as the 'Coulter Law' (after George Coulter, a delegate from the Melbourne Football Club, who chaired the VFL sub-committee appointed to develop player payment rules). The Coulter Law set a maximum match payment (initially £3 per game, with extra payments allowed for unemployed or injured players) and prohibited signing-on fees. Unlike the maximum wage in English football, which was paid year-round, the Coulter Law was a match payment, and players were not paid during the off-season. The regular (home and away) season consisted of 18 rounds of matches; post-season play (finals) to determine the champion (premier) team could extend the season by up to three matches. Over a year, players could expect their earnings from football to amount to no more than around one-fifth of average weekly earnings (see Table 1). The current value of the Coulter

[33] Carlton Football Club, *Annual Report* 1929; Collingwood Football Club, *Annual Report* 1929; Richmond Football Club, *Annual Report* 1929; Stremski, *Kill for Collingwood*, p. 80
[34] Vamplew, *Australians*, p. 383.
[35] Carlton Football Club, *Annual Report* 1929.
[36] Sandercock and Turner, *Up Where, Cazaly?* pp. 105-107.

Law payment was halved during World War II; in the post-war era its real value remained stable in relation to average weekly earnings. In 1946 the VFL introduced a provident fund to provide a lump sum payment upon retirement for all players; in 1965 the League credited £4 per match into each player's fund, supplementing a £10 match payment.[37] No minimum wage was specified and clubs could choose not to pay players. A club found to be in breach of the regulations faced possible losses of match points, and officials and players concerned could be suspended indefinitely.

<Insert Table 1>

'The principle of the flat rate is sound and equitable', argued one football writer when the Coulter Law was introduced. 'It should do much to promote general harmony, and should tend ultimately to even up the strength of the teams'.[38] Booth argues that these outcomes could only have been achieved if all clubs abided by the Coulter Law, as clubs that did not comply could attract high-quality playing talent and raise their winning percentage at the expense of those that did.[39] However, of the four highest-ranked VFL teams in terms of regular season attendance from 1930-70, two (Collingwood and Melbourne) adhered scrupulously to the regulations from the outset. Although compliance was mandatory, non-compliance was difficult to detect, and clubs that chose to comply did so because the regulations were consistent with principles embedded in their historically-evolved culture.

The VFL's maximum wage was in effect modelled on Collingwood's system of player payments.[40] Collingwood's wage structure and level of payment were the reference

[37] Stremski, *Kill for Collingwood*, p. 213.
[38] W. Sharland, "Victorian League Controls Players' Payments: Flat Rate of £3 a Week Adopted," *Sporting Globe* (Melbourne), 12 March 1930, p. 9.
[39] Booth, "The Economics."
[40] Stremski, *Kill for Collingwood*, p. 213.

points used by the League to articulate a standard wage for all players. Established in 1892, Collingwood was based in a low-income working-class district, and soon adopted a policy of equal payment (and reimbursement) of players.[41] After the VFL legalised payment of players in 1911, Collingwood regarded match payments as reimbursement of expenses and time taken off work, and stated its refusal to 'have in the team, to share in the profits, any man who wants to live on the game'.[42] To pay one person, even the coach, more than another was seen as a negative influence on team performance. Collingwood won four consecutive premierships from 1927-30, with a cohesive team popularly known as 'the machine', based on no individual component being more important than another.[43] Jock McHale, who coached Collingwood from 1912-49, recalled in 1953 that 'I aimed to develop good teamwork, not on this line or that, but all over the field. I had no time for a side built up around three or four star players'.[44] The Club could afford to offer inducements to high-quality players from outside its metropolitan zone, 'but that importation cannot possibly be imbued with the same love of the club, with the same desire to serve it through thick and thin, as the recruit who has been born and bred in the district, and who has grown up with the club'.[45] Under McHale's coaching, Collingwood drew far more heavily on players from the metropolitan area than the other clubs under analysis.[46]

Because minor league clubs operated in unregulated labour markets, local patrons, such as farmers and publicans could offer wage premiums for former League players that

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[41] Stremski, *Kill for Collingwood*, p. 153.
[42] *Argus* (Melbourne), 2 May 1911.
[43] Stremski, *Kill for Collingwood*, pp. 87-88.
[44] Quoted by McFarlane, *Jock*, p. 245.
[45] Quoted by Ibid., pp. 289-290.
[46] A sample of playing lists shows that Collingwood drew 82% of its players from its metropolitan zone in 1935 and 89% in 1945. Carlton, Melbourne, and Richmond drew an average of 52% of players from this source in 1935 and 60% in 1945. Calculated from data in Rodgers, *100 Years of AFL Players*; *Collingwood Forever* (https://forever.collingwoodfc.com.au/); *Blueseum* (http://www.blueseum.org/tiki-index.php#&panel1-1&panel2-1); *Demonwiki: The History of the Melbourne Football Club* (http://demonwiki.org/Home); *Tigerland Archive* (https://www.tigerlandarchive.org/tiki-index.php).

compensated for lower levels of prestige and standards of play. Heterogeneously talented teams were assembled by paying one high-quality player to lead and teach skills to unpaid local players. Collingwood cleared several star players to take coaching jobs in minor leagues rather than depart from the principle of equal payment. In 1931, Albert Collier was aged 21 (and had won the Brownlow Medal for the VFL's fairest and best player two seasons earlier) when Collingwood allowed him to join a minor league club in Tasmania, which offered £9 per week to coach and a job as a labourer at £7 per week, instead of paying him the permitted extra £3 per week for unemployed players.[47] In 1940, Ron Todd was aged 23 when he joined a VFA club, having kicked 121 goals in both of the previous seasons.[48] Todd was to receive £500 over the next four seasons, plus match payments of £6; Collingwood was only willing to pay £3 per game.[49] When 27-year old Bob Rose approached the Collingwood committee at the end of the 1955 football season and requested an increase in match payments to help him to buy a house, he was arguably the best footballer in Australia. Tired of living above a shop in inner-city Collingwood, Rose 'was torn between loyalty to the club that had given him so much and being what he considered to be a proper provider for his family'.[50] He accepted an offer to captain-coach a minor league club in country Victoria, for £45 per match plus a house and a sports store to run. Collingwood's committee refused to increase Rose's wages, and cleared him to his new club, where he played for a further seven seasons.[51]

Australian Rules football's foundation club, the Melbourne Football Club, was formed in 1858 by members of the Melbourne Cricket Club (MCC) to help them stay fit during the winter. By 1890, the Melbourne Football Club was bankrupt, and its members

[47] McFarlane, *Jock*, p. 295.
[48] In 1939, the VFA unilaterally ended an agreement with the VFL that required players to obtain a clearance before transferring between the two leagues. For the rest of the sample period, players could move freely between VFL and VFA clubs without the permission of their original club.
[49] McFarlane, *Jock*, pp. 369-370; Stremski, *Kill for Collingwood*, pp. 152-153.
[50] Strevens, *Bob Rose*, p. 100.
[51] Ibid., pp. 105-124.

voted to affiliate with the MCC, with the latter discharging the liabilities and taking over the assets of the football club.[52] Melbourne's football administration, including team selection, was controlled by a sub-committee of the MCC, which interpreted the amateur ideal strictly, refusing to select 'working men'.[53] This was relaxed in 1924, when the committee approved the payment of £3 per week (for two months only) for a former player, Ivor Warne-Smith, to return from Tasmania.[54] After coach Frank 'Checker' Hughes was recruited from Richmond in 1933, Melbourne adopted a more competitive ethos, with win-maximisation confirmed as club's the primary objective. Nevertheless, as at Collingwood, all players at Melbourne were paid equally. Under Hughes (coach from 1933-41 and 1945-48) and Norm Smith (coach from 1952-67), Melbourne fielded teams of homogeneous players with low talent dispersion, but high average skills. Standards of teamwork and discipline were met because the approval of the group was valued, which allowed mutual learning to take place. The committee allowed star players to take coaching jobs in minor leagues rather than attempt to retain them by offering payments above the maximum. Fred Fanning's wage increased from £3 to £20 per game when he left Melbourne in 1947 to coach in country Victoria; Stuart Spencer, the best player on the ground in the 1956 Grand Final, was aged 24 when he took a coaching job in Tasmania the following season.[55]

In insisting on paying its players equally, knowing that other clubs were not doing the same, Collingwood and Melbourne acted non-strategically, which may have reflected their own belief in their superiority as football clubs.[56] After winning the 1936 premiership – its eleventh – Collingwood had won as many premierships as Carlton, Melbourne, and Richmond combined. But Collingwood and Melbourne did not eschew strategic thinking

[52] Batchelder, *Pavilions in the Park*, pp. 259-264.
[53] *Leader* (Melbourne), 2 March 1907.
[54] Batchelder, *Pavilions in the Park*, p. 479.
[55] Collins, *The Red Fox*, pp. 145, 394.
[56] Chwe, *Jane Austen*.

totally, and responded to competition from other clubs by offering non-wage benefits that reduced the reservation wage of potential players. Both clubs found jobs for players through formal coteries of patrons and ex-players, and if necessary paid the educational fees of players.[57] Melbourne offered non-monetary benefits that included the opportunity to play on the Melbourne Cricket Ground (MCG) every second week, and honorary playing membership of the MCC, which gave free admission to all football and cricket matches at the stadium for the duration of a player's career. Melbourne tended to recruit from outside its metropolitan zone, in country Victoria, and these non-wage benefits were attractive to young men who had to leave home and move to Melbourne.[58] To reduce the loss of players to other clubs, Collingwood introduced a retirement benefits scheme in 1911, with deposits made into each player's fund in addition to match payments; these funds were payable only at the end of a player's career.[59]

Collingwood held fast to its principle of equal payment until 1969, when the club made its only apparent breach of the Coulter Law by paying a signing-on bonus, with further bonuses over the next three seasons, to recruit a player from Western Australia.[60] Rumours of these bonuses prompted two of Collingwood's leading players to go on strike in the 1970 pre-season, over demands for a comparable contract.[61] By the mid-1960s, the continuing refusal of the Collingwood and Melbourne committees to breach the maximum wage, and the

[57] Ron Barassi, interviewed by author 2, 18 September 2007; Stremski, *Kill for Collingwood*, p. 204; Carroll, *The Grand Old Flag*, pp. 63-65.
[58] In 1955 and 1965, an average of 53% of Melbourne's playing list was drawn from outside the metropolitan area, compared to an average of 41% at Collingwood and Richmond.
[59] Halabi et al., "Legitimising Amateur Status."
[60] David Williamson's play, *The Club* (1978), is a thinly-disguised portrayal of Collingwood and its struggle to adapt the tradition that it 'would never stoop to buying players' to a modern era, in which the 'days when recruits would flock to the Club from all over the country simply because of its name are long gone'.
[61] Stremski, *Kill for Collingwood*, pp. 220-223.

perception that recruiting was lagging behind that of non-complying clubs, contributed to internal instability at both clubs.[62]

Collingwood and Melbourne's compliance with the Coulter Law lay at one end of a continuum of club strategies. Essendon appears to be the only other club that complied with the Coulter Law throughout the entire sample period.[63] At the other extreme lay Carlton and Richmond. When the maximum wage was introduced in 1930, they, along with Collingwood, were the only clubs that could afford to pay the full amount. These payments were recorded in official, audited financial statements, but Carlton and Richmond used further strategies to recruit and retain players that were hidden to avoid League sanctions, maintaining this approach throughout the sample period. Other clubs' recruiting and player payments strategy varied, being sensitive to financial constraints. For example, in 1930, Fitzroy was sanctioned for paying Haydn Bunton £222 to join the club, with the player suspended for one year. South Melbourne, backed by the owner of a chain of grocery stores, also breached the regulations in the 1930s, assembling a team of interstate stars dubbed the 'Foreign Legion'.[64] Neither could continue such spending in the post-War period. Hawthorn and St Kilda paid well under the maximum prior to World War II, but by the 1960s both clubs were recruiting vigorously, ignoring the regulations to attract star players from interstate.[65]

Two VFL rules allowed clubs to recruit playing talent by breaching the Coulter Law. First, because players from minor leagues who lived outside the metropolitan recruiting zones were free agents, clubs could offer various forms of covert payment to secure them. In 1932, Ron Cooper sailed from Albany, Western Australia to sign with Geelong; Carlton officials

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[62] Ibid., pp. 212-232; Collins, *The Red Fox*, pp. 595-597.
[63] In 1949, Essendon's secretary wrote that 'Essendon has never paid more than the Coulter Law allows … The game has become too mercenary already' (Quoted by Ackerly, *Coleman*, p. 44). Strike action by a group of Essendon players in 1970 was the trigger for the VFL to abolish the regulations.
[64] Branagan and Lefebvre, *Bloodstained Angels*.
[65] Sandercock and Turner, *Up Where, Cazaly?* pp. 105-107, 127; Jack Hale, Graham Huggins, interviewed by Michael Williamson, undated, c. 1996 (held by AFL Films, Australian Football League, Melbourne).

met the ship in Adelaide, and signed Cooper in exchange for £46.[66] Many young players jumped at the opportunity to sign with a VFL club, while others were seen by recruiters as 'on the fishing line, ready to be pulled in'.[67] 'We broke every rule in the book', recalled Richmond's head of recruiting in the 1960s:

> We'd say we can get this guy for a television set, or a suit so we used to take television sets into the mums and dads as an inducement to sign. Or a little bag of low denomination money. We had to compete with the other clubs.[68]

Second, when free agents opted to join a VFL club they were required to sign an agreement called a 'Form Four', which bound them to that club for 12 months. A club's hold on a recruit lapsed if the latter did not a sign a playing contract within a 12-month period. Furthermore, players who lived in a metropolitan zone had to reside at the one address for 12 months to be tied to a VFL club. Clubs could induce players who had signed a Form Four with another club or lived in another club's zone to become free agents by standing out of football or living in a different zone for 12 months. John Coleman, who went on to become one of the game's greatest full-forwards, lived in Essendon's metropolitan zone; Richmond offered him £500 at the end of 1948 to stand out of football (before the start of the 1949 season, the offer was increased to over £1000), and Coleman only joined Essendon when that club guaranteed he would be selected for every game in 1949.[69] Bill Barrot lived in Richmond's metropolitan zone, but three other VFL clubs attempted to recruit him, and he only joined Richmond in 1960 when the club offered him £50, plus a suit.[70] Another

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[66] Main and Holmesby, *Carlton*, p. 102.
[67] Quoted by Bartlett, *Richmond F.C.*, p. 126.
[68] Ibid., p. 126.
[69] Ackerly, *Coleman*, pp. 38-41.
[70] Bartlett, *Richmond F.C.*, p. 173.

important Richmond player of the 1960s, Dick Clay, had signed a Form Four with North Melbourne; Richmond rewarded him with a car for allowing the Form Four to expire.[71]

At Carlton and Richmond, a strategy of breaching the Coulter Law to retain players created hierarchical wage structures, dispersed between highly- and relatively lower-paid players. For example, secret payments to Jack Dyer, Richmond's star player of the 1930s and 1940s, increased his wages from the £3 allowed to £10 per week.[72] Valued players who applied to join minor league teams were offered cash to stay. When Carlton's Jim Clark applied for a clearance in 1951 to take a country coaching job, the club president offered £1000 from his own pocket to match the offer.[73] Less valuable players were paid the maximum wage only, and were allowed to join minor league clubs 'to give them opportunity of receiving monetary reward for their football'.[74] These wage structures reflected club strategies of maintaining heterogeneous talent distributions within teams, which rewarded players who had the greatest influence on team performance, while acting as role models and applying peer pressure to less productive team members.

Table 2 shows winning percentages for the complying and non-complying clubs under analysis. The two compliers had higher winning percentages in games against non-complying teams than in games against each other. Although Melbourne's overall winning percentage was lower than that of Collingwood, and comparable to that of Carlton and Richmond, Melbourne was advantaged by most finals games being played at its home ground, the MCG. During the sample period, Melbourne won premierships – 10 in total – in 53 per cent of seasons in which it qualified for finals; Carlton, Collingwood and Richmond won a total of 15 premierships, on average in 24 per cent of seasons in which they qualified

[71] Ibid., p. 220.
[72] Dyer, 'Captain Blood,' p. 54.
[73] Main and Holmesby, *Carlton*, p. 73.
[74] Richmond Football Club, *Annual Report 1954*, p. 13.

for finals. All four teams had higher winning percentages in matches against other VFL clubs than in matches against the other three in the sample. The large standard deviations of winning percentages for Melbourne and Richmond show significant peaks and troughs in team performance. Melbourne won a hat trick of premierships in 1939-40-41 and five premierships in six seasons in 1955-60, but won less than 20 per cent of matches in 1933, 1953, 1966 and 1969, and 6 per cent in 1951. During the 41-season sample period, there were 24 seasons in which Melbourne or Richmond won less than 50 per cent of their matches, but only 11 seasons when Carlton or Collingwood did so.

<Insert Table 2>

Method

In any match involving the four sample clubs, three scenarios are possible: (1) one team complies (Collingwood or Melbourne) while its opponent does not (Carlton or Richmond); (2) neither team complies (Carlton v. Richmond); (3) both teams comply (Collingwood v. Melbourne). The zero-sum nature of a match allows us to consider the relevance of each teams' strategic behaviour to match outcomes. The variables associated with compliance strategies are based on player turnover, because the retention of players on squad lists normally reflected the value that their clubs placed on their talent.[75] When players with only limited experience were deleted from a playing list, they were likely to have revealed a level of ability and discipline that was below a required standard. Players who could demonstrate competence as a League footballer over several seasons, perhaps developing leadership skills,

[75] This is a variation on standard efficiency wage models, in which workers are heterogeneous and firms choose to pay above the market-clearing rate if a lower wage will reduce the average quality of new workers. Weiss, "Efficiency Wages." Schmidt and Zimmermann follow a similar approach, using firm size as a proxy for wage determinants for which no data is available, such as job satisfaction and labour quality. Schmidt and Zimmermann, "Work Characteristics."

were likely to be important contributors to team performance. If one club is more able than another to prevent losses of experienced players, the predicted result is that this is a product of different compliance strategies, with dispersed wage structures discouraging players from leaving a non-complying club, and compressed wage structures encouraging players to leave a complying club.

For scenario (1), the model uses panel data, as the combinations of a complying club playing against a non-complying club creates four sets of matches.

The regression model for (1) is:

$$y_{it} = \beta_0 + \beta_1 l10c_{it-1} + \beta_2 l10nc_{it-1} + \beta_3 tec_{it-1} + \beta_4 tenc_{it-1} + \beta_5 puc_{it} + \beta_6 punc_{it} + \beta_7 homec_{it} + \beta_8 homec_{it} + \epsilon_{it}, \quad (1)$$

Where *t* indexes a season from 1930-70, *i* is one of the four teams under investigation, and (y_{it}) is the winning percentage per season for compliers in matches against non-compliers. Table 3 lists the other variables, which are based on a dataset that provides information about player careers – the starting and ending season of each, and the total number of games played. The dataset also shows the number of players that a club uses in each season.[76] Two of the variables – the number of players whose career ends with them having played 1-9 games (*l10*), and the percentage of team experience lost (*te*) – are the product of decisions made at the end of a season, and thus affect winning percentage in the following season as players are replaced. Both variables are lagged, as changes to playing lists in one season will affect winning percentages in the following season. *p50* captures the loss of experienced players, defined as those who had played at least 50 senior games, who would have been retained on a list for at least three seasons. The quality of playing talent may be expected to change over

[76] The dataset has been constructed from information in Rodgers, *100 Years of AFL Players*.

time, increasing as players gain experience, but also diminishing as they age and suffer injuries. This is modelled by focussing on changes in player turnover from the average, and its effect on winning percentages in the following season; thus the independent variables are demeaned. . Intuitively, team performance may be expected to be indirectly related to the number of players used compared to the mean in a season (*pu*), as teams that perform poorly during a season are likely to make frequent team changes, due to injuries and loss of form. Furthermore, once a team is unable to qualify for the finals, it may choose to experiment with team composition by trying new players, increasing *pu*. To capture the effect of home ground advantage, a *home* dummy variable is set to one when in a given scenario a team plays the only match in a season on its own ground.[77] All of these variables are linked to the complying (*c*) and non-complying (*nc*) teams within the model. A positive coefficient means a greater than average win per cent for complying teams, and a negative win per cent for non-complying teams. Both fixed and random-effect GLS models were estimated.[78] There are 41 observations for each scenario, because the regulations operated from 1930-70, but the use of lagged variables results in 40 useable observations per panel.

<Insert Table 3>

[77] During the sample period, the VFL scheduled 18 home and away rounds in almost all seasons, which in a 12-team competition meant that each team played four others only once during a season.
[78] Tests were conducted for stationarity and autocorrelation. In (1), there are combinations involving all of the sample teams and the data is panel in nature. A panel-data unit-root test was conducted once the variables were demeaned. Levin, Lin and Chu, "Unit Root Tests." All variables were found to be stationary and there is sufficient evidence to reject the null hypothesis.

For (2) and (3), the data is time series but no longer panel, given that only one set of matches is considered in each scenario.

The regression model for (2) and (3) is:

$$y_t = \beta_0 + \beta_1 l10r_{t-1} + \beta_2 l10ca_{t-1} + \beta_3 ter_{t-1} + \beta_4 teca_{t-1} + \beta_5 pur_t + \beta_6 puca_t + \epsilon_t, \quad (2)$$

The two models are run on the basis of compliance strategy, with variables for the clubs that complied – Melbourne (m) and Collingwood (co) – and those that did not comply – Richmond (r) and Carlton (ca). In (2), the dependent variable is the winning percentage per season for Richmond in matches against Carlton; in (3) the dependent variable is the winning percentage for Melbourne in matches against Collingwood. Given the zero sum nature of these sets of matches, the selection of either club for analysis has no impact on the result, as a positive winning outcome for one club is necessarily offset by a negative outcome for the other.[79]

To further assess the impact of the labour market regulations, we use a difference-in-differences (DID) analysis to determine if there is a change in outcomes (winning percentage against all VFL teams) in the ten seasons after the regulations were introduced (1930-39), compared to the ten previous seasons (1920-29). The compliers are the treatment group, as their operations were affected by the regulations; the non-compliers are the control, as they continued to operate as before.

The regression model for the DID analysis is:

$$y = \beta_0 + \beta_1 \mathrm{dB} + \delta_0 \mathrm{d2} + \delta_1 d2 * \mathrm{dB} + \mathrm{u} \quad (3)$$

[79](2) and (3) involve only one pair of teams and the data is times series. An augmented Dickey-Fuller unit-root test was conducted, with the variables found to be stationary. For the panel data, the Wooldridge test for autocorrelation did not find that the presence of autocorrelation. Drukker, "Testing for Serial Correlation;" Wooldridge, Econometric Analysis. In the time series regressions, a Durbin-Watson and Cumby-Huizinga general test for autocorrelation in time series is performed. Baum and Schaffer, "IVACTEST." In Durbin-Watson and Cumby-Huizinga, (2) passed at the 5 per cent level. Model (3) passed the Cumby-Huizinga at the 5 per cent level, but was within higher and lower bound for Durbin Watson, thus there is a lack of evidence to reject autocorrelation.

The analysis captures changes in winning percentage per season for the four clubs of interest. There are three variations in each team's winning percentage: versus all VFL teams, versus the teams pursuing the opposite compliance strategy, and with controls. The dummy variable *dB* captures possible difference between the treatment (compliers) and controls (non-compliers) groups prior to the policy change. The time period dummy, *d2*, captures aggregate factors that would cause changes in *y* in the absence of a policy change, for the 1930-39 period. The coefficient of interest, δ_1 multiplies the interaction terms, *d2*db*, which is the same as a dummy variables equal to one for those observations in the treatment group in the second period. This allows us to test for a difference in winning percentages for the treatment group (*compliers*) after the policy intervention.

Results

Table 4, which reports the mean, minimum/maximum, and standard deviation of *l10*, *te*, *pu*, and *p50* for the sample clubs, reveals two strategies that were effective in increasing winning percentages. First, turning over players and replacing them with new (if untried) talent had a positive effect on winning percentage in the following season for all four clubs. This is a counterintuitive result, but one that reflects how team's performance may benefit from having removed less productive members at the end of the previous season. The effect on winning percentage of moving inexperienced players on was only significant for the complying clubs. Collingwood and Melbourne's comparative advantage in non-wage benefits derived from tradition and prestige were attractive to new recruits, allowing replenishment of teams at zero marginal cost, given that new players received no payment above the maximum wage. However, this wages policy made the complying clubs vulnerable to losses of experienced players, as evidenced by the higher standard deviation for *p50*.

<Insert Table 4>

A second effective strategy was to retain experienced players by making secret payments above the maximum wage. This is revealed by the non-compliers recording a lower standard deviation in *te* , consistent with anecdotal evidence that evading the regulations gave Carlton and Richmond more discretion in meeting the demands of required players and potential recruits. Carlton's mean of loss of inexperienced players (*l10*), loss of experienced players (*p50*), team experience (*te*), players used per season (*pu*), and standard deviation for each of these four independent variables, are the lowest of the sample. Richmond's high turnover of 1-9 game players (*l10*) suggests that the club paid less experienced players the maximum wage (or less), with star players capturing a larger share of the total payroll. For *l10* and *te*, the standard deviation for the compliers is higher. Melbourne records the highest maximum loss of both inexperienced (*l10*) and experienced (*p50*) players in a season.

Once the variables are demeaned (see Table 5), the results show the importance of team stability to winning percentage. For all teams, an increase in the number of players used in a season (*puc* and *punc*) has a negative effect on winning percentage. This makes intuitive sense, as teams will use more players than average in a season if the number of players that are injured, suspended, omitted due to poor form, or leave the club during the season is also above average. Injuries are exogenous events, but team morale (reflected by players' form and the willingness of players to leave the club) is an endogenous variable that may have been affected by the wage levels offered.

<Insert Table 5>

The following results in Table 5 are significant at the 5 per cent level or lower. In (1), the winning percentage of complying teams declines by 4.5 per cent for every player used above the mean (*puc*); that of the non-complying clubs fell by 2 per cent (*punc*). Due to zero-summing, these decreases in winning percentages are exactly offset by increases in the winning percentage of the opposition. A Wald Test shows the difference between numbers of players used in complying and non-complying teams to be statistically significant when compared in a post-estimation. This indicates that the non-compliers were better able to control the number of players used within a season. In (2), Richmond's winning percentage declines by 4.5 per cent for every player the club uses above the mean; Carlton's results are not significant. In (3), Melbourne's winning percentage increases by 3.4 per cent for every player used above the mean by Collingwood, but the estimate is only significant at the 10 per cent level.

In (1), the effect of loss of team experience on winning percentage is negative for the complying clubs (*L.tec*) in matches against the non-complying clubs. Melbourne's high standard deviation in *te* (see Table 4) suggests that compliance made it difficult for the club to retain experienced players, with losses of experience in some seasons predicting a lower winning percentage in the following season. Melbourne has a negative result for loss of team experience (*L.tem*) in (3), for matches against Collingwood (see Table 5). If Melbourne loses 37.7 per cent of its previous season's team experience (10 percentage points above the mean of 27.7 per cent for *te*) due to player retirements, winning percentage in the current season in matches against non-compliers is predicted to decline by 9.7 per cent. In that situation, Melbourne's winning percentage in matches versus Collingwood is predicted to decline by 21.1 per cent. Losses in team experience by the non-compliers have no statistically significant effect on the winning percentage. The negative impact of Melbourne's losses of experience on winning percentage in the following season was partly offset by the positive

effect of turning over inexperienced players. Compliers increase their winning percentage by 3.3 per cent for the deletion of every player with 1-9 games of experience above the mean at the end of the previous season (*L.l10cm*). Furthermore, in seasons where a complying team plays one match against a non-complier at its home ground, *homec* is significant and positive, predicting a 22 per cent higher winning percentage compared to a base case of seasons where two teams play at least twice per season (home and away, and/or in finals). In seasons where complier and non-complier play once but at the latter's home ground there is no significant relationship, which indicates that compliers had the stronger home ground advantage.

The DID analysis shows no significant variation in winning percentages based on the treatment group (the compliers) (see Table 6). All four teams in the sample group improved their winning percentage against all other VFL teams by 10.5 per cent in 1930-39 compared to 1920-29, but the result is only significant at 10 per cent levels. Controls with turnover on younger players (*L.l10*) and team experience (*Lte*) were similar to the main results. The interaction term shows the results for the treatment group to be no different for the 1930-39 and 1920-29 periods, and for the control group (the non-compliers). The teams that were successful prior to the Coulter Law continued to be so: Collingwood, premiers in 1927-28-29, won three premierships in the 1930s and a further two in the 1950s; Melbourne, premiers in 1926, won ten premierships during the operation of the Coulter Law. This is consistent with Booth's, and Masson, Sim and Wedding's findings that the Coulter Law did not reduce the disparities in performance between teams.[80]

<Insert Table 6>

Conclusion

[80] Booth, "The Economics;" Masson, Sim and Wedding, "Did the AFL Equalization Policy."

Owners of sportsman teams pursue a sole objective of winning matches. League rules that regulate labour markets by compressing pay differentials between heterogeneously talented players may be incompatible with this objective if such pay structures reduce winning percentages. Sportsman owners who seek to invest as much as they can in playing talent subject to a breakeven constraint may have an incentive to defect from labour market regulations if pay differentials increase winning percentages. If it is possible to evade labour market regulations, the outcome of any given match between sportsman clubs will be affected by whether or not the participants have chosen to comply.

Drawing on newly compiled data based on team playing lists and the careers of all individual players during the period of labour market regulation, we model variables to predict team performance in matches where either team may or may not have evaded labour market regulations. Within this set of teams winning percentages are zero-sum. The closeness of winning percentages between the four teams suggests that the complying clubs benefited from a business strategy of building homogeneously talented teams, while the non-complying clubs benefited from a different strategy, of building heterogeneously talented teams. In matches between the four teams, the effects of these talent distribution and payroll structure strategies largely cancelled each other out. The complying clubs were advantaged by non-wage benefits associated with tradition and prestige, and competition with non-complying rivals may have created incentive effects that encouraged strategic use of these assets. For the non-complying clubs, gaming the Coulter Law to keep up with the complying clubs was like an arms race, with extra resources being allocated to competition without a major change in the distribution of winning percentages. Complying clubs were more likely to turn over inexperienced players who did not perform at a required standard, but were also more likely to lose experienced players, many of whom moved to higher-paying minor leagues. For all four clubs, an increase in the number of players used in a season had a negative effect on

winning percentage. All four clubs maintained higher winning percentages against the other VFL clubs, which suggests that both compliance strategies were effective against teams with less prestige, and fewer resources.

These historic patterns of compliance and defecting behaviour created path dependent trends that operated after the regulations were abolished. In the period from 1967-83, all VFL premierships were won by the historic non-compliers (Carlton and Richmond), or clubs that benefited from rule changes (Hawthorn, from the extension of zoning outside metropolitan Melbourne in 1967, and North Melbourne, from a 1973 rule that made all players with 10 years of service free agents). The historic compliers (Collingwood and Melbourne) were less successful in adapting to a new labour market regime, with to date only Collingwood winning premierships (in 1990 and 2010) outside the sample period.

The questions asked by economists about team objectives and talent investment strategies in professional sports can be applied to the full range of sports organisations, from amateur to semi-professional teams and leagues. In professional leagues, labour market regulation is generally considered to be a profit-maximising strategy, which may break down if sportsman team owners are able to avoid compliance. In a semi-professional league, the choice of team owners to comply may reflect the congruity of regulated labour markets with amateur principles and embedded cultures that valued even team performances. In our case study, it was possible for owners to either maintain equal or dispersed pay structures within the one labour market regulation regime.

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