Sharing the Wealth in the "New NHL": The Implications of Revenue Sharing for Competitive Balance, Payroll Spending, and Profits

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The National Hockey League was in trouble at the end of the 2003-04 season. Not only were teams losing money, but many fans, especially in the non-traditional small-markets, were losing interest. In response, team owners and player representatives collaborated on a new collective bargaining agreement that included a brand new economic system for the League. In addition to instituting a salary cap to help small-market teams remain financially viable, the League sought to improve competitive balance by devising a complex revenue sharing system. After explaining the system in detail, this article identifies how revenue sharing will affect ownership behavior in the hockey players’ labor market, concluding that the system’s large negative effect on the marginal revenue product of small-market teams will render it ineffective at achieving its goal of a higher level of parity.

At the conclusion of the 2003-2004 season, the National Hockey League (NHL) limped off the ice and into an unprecedented 301-day lockout that would eventually result in league commissioner Gary Bettman’s cancellation of the entire 2004-2005 season, the first such cancellation in the history of the four major sports leagues. The league, victim of a broken economic system, was replete with problems—player salaries were spiraling out of control, twenty teams were claiming monetary losses in the millions, game attendance was at a four-year low, and five televised games of the Stanley Cup finals between the Tampa Bay Lightning and the Calgary Flames averaged a lowly 2.6 on the Nielsen scale, making the series the 19th most-watched network television program that week.¹ In addition to these problems, team owners in the non-traditional, small market, Sun Belt cities such as Nashville, Charlotte, and Atlanta, where the NHL had aggressively expanded during the 1990’s, were claiming a lack of competitive balance.² League economics, they asserted, made it impossible for their front offices to compete for top free agents and subsequently assemble a competitive team, which was the root cause of anemic attendance and steadily decreasing revenues. Although complaints about financial losses and competitive balance may have simply been a smoke screen to disguise owners’ desire to stuff their pockets, when team owners and the National Hockey League Players Association (NHLPA) began haggling over the details of a new collective bargaining agreement (CBA), measures aimed at improving competitive balance were among the main points of contention.

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When a new agreement was finally reached, an extensive player cost redistribution system—also known as revenue sharing—was one of the main additions. In combination with a hard payroll cap, the plan promises to help restore parity to the league by redistributing a minimum of 4.5 percent of league revenues ($77 million, if league revenues reach the projected $1.7 billion) from the top ten revenue producing clubs to the bottom ten revenue producing clubs. Architects of the deal claim that the redistribution should allow low-revenue teams like Nashville and Carolina to be more financially competitive in free agency, which should presumably help them be more competitive on the ice. This article will attempt to assess the validity of these claims, identify incentives that the plan might create for team owners and general managers in terms of payroll spending, and finally, illuminate the effect of revenue sharing on profits.

How the System Works

The concept of revenue sharing, although new to hockey, is not new to professional team sports. The National Football League (NFL), National Basketball Association (NBA), and Major League Baseball (MLB) have, over the years, adopted varying degrees of revenue sharing to help alleviate disparities between the financial haves and the financial have-nots. All three leagues divide locally earned television and gate receipt revenue and allot a certain percentage to the home team and a complementary percentage to the visiting team. The NFL’s agreement – by far the most generous of the three leagues’ – allows the home team to keep 64 percent of the total while reserving 36 percent for the visiting team. The NBA employs a stingier 95 to 5 percent home to visiting team split, while MLB has teams donate 20 percent of all net local revenue to a pool, sharing three-quarters of the pool among all thirty teams and splitting the remaining quarter among only those teams with below-average team revenue, in proportion to how far they are below the mean (Zimbalist 2003, 90).

Despite its unanimous use in the other three leagues, the architects of the NHL deal eschewed the home team-visiting team split in favor of a more complex scheme. First, in order to receive transfers, a team must meet three eligibility requirements. An eligible club must be among the fifteen (bottom half) lowest clubs in terms of gross regular season revenues, have an available team player compensation (54 percent of revenues) that is below the pre-established payroll midpoint, and be located in a designated metropolitan area with fewer than 2.5 million TV households. This means that Anaheim, New Jersey, and the New York Islanders would have all been ineligible to receive money via revenue sharing in 2003-04, despite being in the bottom half of the league in terms of revenues.

The funding for the NHL’s shared revenue pool, unlike that of the other leagues, will be completed in four sequential phases, all of which are described in Table 1. The first phase draws on any centrally generated league revenues over $300 million. That is, if revenues generated by the NHL’s broadcasting contracts, NHL Enterprises, league sponsorships, etc. should exceed $300 million, the league must devote up to one-half of those incremental revenues to fund as much as one-fourth of the minimum
redistribution requirement, which the league has set at 4.5 percent of total revenues. Following funding from league coffers, the league will pilfer the escrow accounts of the top ten revenue-producing teams with payrolls above the midpoint. Whereas teams in the bottom two-thirds of the league in revenues will be refunded the money accrued in their escrow accounts at the end of the season, the money in the escrow accounts of the top ten revenue teams will be committed to covering as much as one third of the remaining balance to be shared. If the league has still not met the minimum redistribution requirement following the escrow funding phase, the remaining balance will be funded on a 50-50 basis by playoff gate receipts and a supplemental funding phase.

In the playoffs funding phase, all teams who make the postseason will be obligated to pay a percentage of their playoff ticket sales to the shared revenue pool; however, those at the top of the revenue pile will pay more than those at the bottom. Specifically, playoff teams that are in the top third of the league in gross regular season revenues will be taxed 50 percent of the revenue generated by a sold out arena (independent of whether or not the game actually sells out) for every home playoff game that the team plays. Those in the middle third (teams 11-20) will pay 40 percent, and those in the bottom third in revenue (teams 21-30) will share 30 percent.

<table>
<thead>
<tr>
<th>Funding Phase</th>
<th>Percentage of Pool</th>
<th>Description</th>
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<tbody>
<tr>
<td>Centrally Generated League Revenue Phase</td>
<td>Up to 25% of minimum distribution requirement</td>
<td>League may use up to half of any centrally generated league revenues (NHL Enterprises, television, sponsors, etc) in excess of $300 million to fund, at most, one fourth of the minimum redistribution requirement.</td>
</tr>
<tr>
<td>Escrow Funding Phase</td>
<td>Up to 33% of remaining balance (25-33% of total)</td>
<td>At the end of the season, money accrued in the escrow accounts of the top ten teams in terms of revenue will be committed to covering up to one third of the remaining balance after Phase 1.</td>
</tr>
<tr>
<td>Playoffs Funding Phase*</td>
<td>50% of remaining balance after Phase 2 (25-50% of total)</td>
<td>Each playoff team will be taxed a certain percentage of every playoff ticket sold. Teams in the top third of the league in terms of revenue will pay 50%, second third, 40%, and bottom third, 30% of each ticket.</td>
</tr>
<tr>
<td>Supplemental Funding Phase*</td>
<td>50% of remaining balance after Phase 2 (25-50% of total)</td>
<td>Supplemental funding phase will be funded by the top ten revenue teams, with each paying a proportion of the total based on how much higher their revenues are from the eleventh-ranked revenue team (see Table 2).</td>
</tr>
</tbody>
</table>

NOTE: *If the league has still not reached the minimum redistribution requirement after the escrow funding phase, the remaining balance will be split 50:50 between playoffs funding and supplemental funding phase.
The final phase of funding for the shared revenue pool is the supplemental funding phase. The money from this phase will come exclusively from the top ten revenue-generating teams; however, the exact portion of the total that each team pays will vary. To calculate how much each team will pay, all teams in the league will be ranked by gross regular season revenues. Each of the top ten revenue-grossing teams in the league will then have their revenues compared to the revenues of the eleventh-ranked team. After subtracting the eleventh-ranked team’s revenues from each of the top ten teams’ revenue, the league will total the incremental revenues \( [(R_{\text{Team 1}} - R_{\text{Team 11}}) + (R_{\text{Team 2}} - R_{\text{Team 11}}) + (R_{\text{Team 3}} - \cdots)] \) and assess each of the top ten teams a percentage of the supplemental funding amount by dividing their individual incremental revenues by the total incremental revenues. The steps of this calculation are illustrated in Table 2.9 Take the first-ranked team, the Rangers, as an example. In 2003-04, the Rangers grossed a league-leading $118 million in revenues during the regular season. This was $44 million more than the eleventh-ranked team, San Jose. Dividing this $44 million by $253 million, the total incremental revenues of all ten teams, reveals that the Rangers will be assessed 17.39 percent of the total owed to the shared revenue pool from the supplemental funding phase.10

After the league disburses all of the revenue transfers, a set of rigorous performance standards exists to ensure that team owners are spending their revenue transfers on payroll instead of just pocketing the cash and looking forward to the next year’s transfer. In addition to initial eligibility qualifications described above, for the 2007-08 season, teams eligible to receive transfers must also be generating year-to-year revenue growth greater than the league average \textit{and} averaging paid attendance of either 13,125 or the average league-wide paid attendance in order to continue to receive transfers.11 In the league’s eyes, teams that spend their transfers on hiring more or better playing talent should have no trouble keeping pace with these standards; however, teams who choose instead to pocket the money and not spend it on improving their talent

<table>
<thead>
<tr>
<th>Rank</th>
<th>Team</th>
<th>Revenues (Millions)</th>
<th>Incremental Revenues</th>
<th>Percentage Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NY Rangers</td>
<td>$118.0</td>
<td>$44.0</td>
<td>17.39%</td>
</tr>
<tr>
<td>2</td>
<td>Toronto</td>
<td>117.0</td>
<td>43.0</td>
<td>17.00</td>
</tr>
<tr>
<td>3</td>
<td>Philadelphia</td>
<td>106.0</td>
<td>32.0</td>
<td>12.65</td>
</tr>
<tr>
<td>4</td>
<td>Dallas</td>
<td>103.0</td>
<td>29.0</td>
<td>11.46</td>
</tr>
<tr>
<td>5</td>
<td>Colorado</td>
<td>99.0</td>
<td>25.0</td>
<td>9.88</td>
</tr>
<tr>
<td>6</td>
<td>Detroit</td>
<td>97.0</td>
<td>23.0</td>
<td>9.09</td>
</tr>
<tr>
<td>7</td>
<td>Boston</td>
<td>95.0</td>
<td>21.0</td>
<td>8.30</td>
</tr>
<tr>
<td>8</td>
<td>Montreal</td>
<td>90.0</td>
<td>16.0</td>
<td>6.32</td>
</tr>
<tr>
<td>9</td>
<td>Tampa Bay</td>
<td>88.0</td>
<td>14.0</td>
<td>5.53</td>
</tr>
<tr>
<td>10</td>
<td>Los Angeles</td>
<td>80.0</td>
<td>6.0</td>
<td>2.37</td>
</tr>
<tr>
<td>11</td>
<td>San Jose</td>
<td>74.0</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>$253.0</td>
<td></td>
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</tr>
</tbody>
</table>

NOTE: Based on National Hockey League data for 2003-04 season.
level will likely fall short of these standards. By punishing non-performing teams with as much as a 50 percent reduction in the amount of transfer they are eligible to receive, the league hopes that owners will choose the former option instead of the latter.  

Establishing a Link Between Payroll and Performance

The use of revenue sharing as a means of narrowing the performance gap between high-revenue and low-revenue teams implies a belief, at least in part, that giving low-revenue teams more money to spend on payroll will positively impact the number of games that those teams win in a given season. If no such relationship between payroll and performance exists, the result of revenue sharing is simply a better-looking bottom line for low-revenue teams, at the expense of their high-revenue counterparts, with no effect whatsoever on competitive balance.

We attempted to establish a link between team payroll and performance for the NHL mathematically, using ordinary least squares regression. Using Zimbalist’s (2003, 43) method as a model, we estimated the following equation for each team \( i \) in year \( j \):

\[
\text{Points}_{i,j} = \alpha_i + \beta \frac{\text{Payroll}_i}{\text{LeagueAvgPayroll}_j} + e_i
\]

In choosing the appropriate variables for our calculations, we had to take several considerations. First, professional ice hockey is peculiar among team sports in that the teams are not ranked simply based on winning percentage. Rather, teams are ranked based on a point system that awards two points to the winner of a contest, and one point to each team if the contest ends in a tie. Since ties affect teams’ relative on-ice success, but are not reflected in teams’ winning percentage, we chose to use points, not winning percentage, as the dependent or outcome variable, \( y \). 13 Secondly, because we are primarily concerned with each team’s payroll as it affects their ability to compete with other teams for free agents, a team’s absolute spending power is less important than its ability to spend relative to that of its competitors. In order to capture the importance of relativity into our study, we calculated a ratio that reflects each team’s payroll relative to the league average payroll for the year in question (team payroll/average league payroll), and used this as the independent or causal variable, \( x \). After choosing our variables and eliminating expansion team data, 14 we calculated payroll’s effect on winning for each individual season since 1994-95, as well its effect over the decade as a whole. 15

The resulting coefficients of determination \( (r^2) \), shown in Table 3, suggest an inconsistent relationship between the two variables over the time period tested. Over the course of the decade, the link between relative payroll and relative performance was significant at the 5 percent level six times, but at the 1 percent level only three times. In the 1994-95 season, only 15.1 percent of the variation in points scored could be attributed to relative differences in payroll, rising only to 23.2 percent in the next season. Between 1996-97 and 1998-99, money’s influence on successful performance weakened
to a level of statistical insignificance, affecting less than ten percent of the variation in points scored in each season during that span. The relationship strengthened, albeit mildly, during the transition to the new millennium. Yet even at the point when the relationship between relative payroll and performance was strongest, in 2002-03, the amount of money teams spent on their payroll relative to rival teams explained only 33.5 percent of the variation in points scored. While this is considered to be a strong relationship in a cross-sectional comparison, the relationship between the two variables for the decade as a whole ($r^2 = 0.150$) is weak by more rigorous standards for time series data. Thus, in the last decade it seems that a team’s ability to compete on the ice had relatively little to do with how liberal they were with the pocketbook. Indeed, not even a league-high payroll nearly two times the league average could save the 2003-04 New York Rangers from winning a mere 32.9 percent of their contests that year.

The reasons for such a remote relationship between payroll and performance in hockey are two-fold. First, the ebb-and-flow nature of a hockey game and the constant rotating of players on and off the ice make team chemistry a paramount concern for a hockey team. As a result, the simple accumulation of the best players may not lead to a successful team if those players do not play well together. The second reason for the weak statistical link between payroll and performance is largely a function of the recently expired CBA, which is why these findings should not be interpreted as prima facie evidence that revenue sharing will fail as a mechanism to improve competitive balance in the new NHL. Under the old agreement, players could not achieve unrestricted free agent status until they reached the age of thirty-one (Article 10.1i). Given the degree of physicality permitted in hockey, players’ bodies tend to deteriorate more rapidly than in other sports, meaning that most players have reached, or even passed their prime performance years once they reach this age.16 As a result, building a team through high-priced free agent acquisitions is a less viable strategy than it is in, say, baseball, where players continue to be productive well after their original contracts have expired (Zimbalist 2003, 182).

Under hockey’s new agreement, however, some players will have the ability (based on tenure) to be-

### TABLE 3 Yearly Relationship Between Team Payroll and Performance, 1994-2004

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</tr>
</thead>
<tbody>
<tr>
<td>Coefficient (Std Error)</td>
<td>.389* (13.501)</td>
<td>.482* (13.741)</td>
<td>.240 (10.773)</td>
<td>.320 (11.272)</td>
<td>.198 (13.809)</td>
<td>.441* (8.128)</td>
<td>.470** (9.974)</td>
<td>.411** (7.745)</td>
<td>.578** (6.667)</td>
<td>.303 (7.572)</td>
<td>.388** (3.026)</td>
</tr>
<tr>
<td>$r^2$</td>
<td>0.151</td>
<td>0.232</td>
<td>0.057</td>
<td>0.039</td>
<td>0.077</td>
<td>0.194</td>
<td>0.229</td>
<td>0.169</td>
<td>0.335</td>
<td>0.092</td>
<td>0.150</td>
</tr>
<tr>
<td>$t$-statistic</td>
<td>2.069</td>
<td>2.695</td>
<td>1.209</td>
<td>1.656</td>
<td>0.989</td>
<td>2.456</td>
<td>2.782</td>
<td>2.388</td>
<td>3.752</td>
<td>1.681</td>
<td>6.954</td>
</tr>
<tr>
<td>$n$</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>275</td>
</tr>
</tbody>
</table>

*p ≤ 0.05, **p ≤ 0.01
come unrestricted free agents as early as age 25. This means that free agency should become a less risky and more oft-used option for general managers, in which case revenue sharing transfers will be critical to the low-revenue teams’ ability to compete in the free-agent market. Until this trend manifests itself; however, we should be wary of the assumption that spending more money leads to performing better on the ice.

Analysis

The fundamental cause of competitive imbalance in any sports league is the disparate capacity of teams to generate revenues. For franchises who reside in cities with a larger and more affluent pool of fans to draw from, the attraction of a star player is guaranteed to generate more demand, and thus, more revenues than the same player would in a smaller city (Fort 2003, 190). Since this is true, players represent greater value to large-market teams, which leads them to outbid and subsequently outperform their small-market counterparts in the quest to obtain the best talent. The result is an uneven distribution of playing talent among teams in the league and thus league dominance by the large-market, high-revenue clubs that can attract and afford the best players. In light of the fact that the uncertainty of the outcome of a sports contest is a strong determinant of fan demand, this situation is wholly undesirable, as fans will not come to the arena if they do not believe their team has a chance to win. Indeed, this is what Columbus Blue Jackets’ President, Doug Maclean, was getting at when he said, “The level playing field is huge for us, because that alone should enhance revenues.”

Revenue sharing attempts to avoid this situation and improve balance by taking money away from the large-market teams and giving it to the small-market teams. When money is taken away from a large-market team, the marginal revenue product (MRP) of a unit of talent on that team unambiguously decreases because the team must share part of the revenue that that talent helps create. Since this automatically makes players less valuable to the large-market team, it should level salary offers to a range in which small-market teams can compete. More importantly, the money transferred to the small-market teams ensures that they can compete in the free agent market while remaining financially viable. Many studies have modeled the effects of traditional revenue sharing schemes on competitive balance to see if this is actually the case; however, the results are mixed. In his seminal work on the labor markets of professional sports leagues, Simon Rottenberg (1956) argued that revenue sharing would not affect balance in a profit-maximizing league. El Hodiri and Quirk (1971) proved this assertion by using a model in which each team’s MRP was affected equally by sharing; however, Marburger (1997) came to an alternate conclusion, saying, “revenue sharing that does not have a uniform impact on marginal revenue products will affect league balance.” That is, if revenue sharing has a larger negative effect on large-market MRPs than it does on small-market MRPs, balance will improve. This is displayed in Figure 1. We assume that this non-uniform effect on MRPs is what the NHL was trying to accomplish when it instituted a system that takes exclusively from the
large-market teams and gives exclusively to the low-revenue clubs. Our analysis will begin with an examination of the effects of revenue sharing on the MRPs of the different teams.

Before proceeding, it is important to note that centrally generated league revenues for the NHL have never eclipsed $300 million, the point at which those revenues begin going into the shared revenue pool. While central league revenues steadily approached the $300 million benchmark in the last few seasons prior to the lockout; they will not reach this level in 2005-06 and it is improbable that they will climb significantly above $300 million in the immediate future. Accordingly, our analysis assumes the shared revenue pool to be funded entirely by the last three phases of funding. This is important because the added emphasis on the playoffs funding phase and supplemental funding phase has strong implications for team spending patterns.

Payroll Spending Incentives

In 2002, Major League Baseball faced a competitive balance problem similar to that of the NHL. Baseball, too, chose revenue sharing as a partial solution to the problem. Unfortunately for the league, the system of sharing was constructed in such a way that for every dollar of additional revenue that a
low-revenue team earned, that team’s revenue transfer decreased by as much as 47 cents. Combining this decrease in transfer money with the cost of accumulating more talent actually made it unprofitable for the bottom teams to acquire talent in an attempt to grow revenues; as a result, owners like David Glass of the Kansas City Royals (whose team had little hope of reaching the postseason) found it optimal to lower payroll and perform worse than they had before. Performing worse invariably led to lower revenues; however, with lower revenues owners could expect a larger revenue sharing transfer from the league. Thus, instead of ameliorating competitive balance as it originally set out to do, MLB’s revenue sharing plan actually made the problem worse, as the teams at the bottom of the standings performed even worse than they had before (Zimbalist 2003, 103).

Despite the NHL’s best efforts to avoid baseball’s fate and to construct a revenue sharing system that incentivizes performance and encourages teams to spend revenue transfers on payroll, the marginal tax rates created by hockey’s revenue sharing system give teams receiving a transfer a strong incentive to refrain from spending additional money on playing talent. Consider the following example:

The Carolina Hurricanes project to gross $45 million in regular season revenues. Per the salary cap, which reserves 54 percent of all revenues for the players, the ‘Canes must spend a minimum of $24.3 million on player salaries. Assuming a payroll midpoint of $28 million for the league, Carolina can expect to receive a transfer in the amount of $3.7 million, the difference between its available team compensation and the midpoint (CBA, Article 49.4). Now, assume that the Hurricanes have the opportunity to hire free agent winger Erik Cole, a player whose contribution they estimate will create an additional $2 million in revenues.21 If the Hurricanes hire Cole, their revenues will rise to $47 million, which will simultaneously increase their available team compensation—54 percent of revenues—to $25.4 million. Since the Hurricanes now have a higher ability-to-pay in the eyes of the league, their revenue transfer will decrease to $2.6 million ($28 million - $25.4 million = $2.6 million). In essence, for every dollar of additional revenue that Cole creates, 54 cents is deducted from the Hurricanes’ revenue transfer. Thus, the net revenue effect of hiring Cole, i.e. his marginal revenue product, is no longer $2 million. Rather, due to the $1.1 million loss in transfer money that accompanies his signing; his net value is reduced to only $900,000, not including the cost of paying his salary. When the monetary value of Cole’s contribution decreases, the team’s willingness to pay him decreases as well; therefore, instead of offering Cole a salary up to his expected incremental contribution of $2 million, the Hurricanes’ front office will only hire him if he agrees to play for less than $900,000. If they pay him any more, hiring his services will actually cost them money, meaning that they will be financially better off by holding on to their cash and not hiring him.22 Mathematically speaking, if the decrease in revenue sharing transfer plus the additional payroll cost exceeds the increase in total revenue that comes as a result of hiring talent, then not spending would be the profit-maximizing strategy. For that reason, if owners behave rationally, in many cases they should pocket their transfers instead of acquiring more or better playing talent, as the league would hope (Zimbalist 2003, 103). Adding to this disincentive to spend transfer money on talent is the potential for these
teams to receive a share of any leftover escrow funds. If adequate funds are present in the escrow account at the end of the season, teams with payrolls below the midpoint will receive a second transfer in the amount of the difference between the payroll midpoint and their available team compensation (CBA, Article 49.7). Continuing with the preceding example, if the Hurricanes decide not to hire Cole, they are eligible for two revenue transfers of $3.7 million, the first coming from the shared revenue pool, and the second coming from the excess escrow funds. Since their escrow disbursement is also tied to team revenues, if they decide to hire Cole, they are taxed 54 percent not only on their original revenue transfer, but also on their allotted escrow outlay. Thus, the cumulative tax rate on teams receiving a revenue transfer has the potential to be as high as 108 percent.

While the preceding example successfully demonstrates the negative effect of revenue sharing on the marginal revenue products of the low-revenue teams, in order to examine the system’s overall effect on competitive balance we must also consider the effect that sharing has on the marginal revenue products of the high-revenue teams that are contributing to the shared revenue pool. As we stated before, if the MRPs of high-revenue teams are more negatively affected than those of the low-revenue teams, we can expect league balance to improve. This is not the case. In fact, a cursory analysis (the actual tax rates are difficult to calculate) suggests that the opposite is true. The reason for this is the fact that the sources of funding for the shared revenue pool are so diverse. The league contributes everything during the first phase of funding. Since any overages in the top teams’ escrow accounts are disbursed to only those teams with payrolls below the midpoint, no team in the top ten in revenue will receive anything back from their escrow account, meaning that they are not affected on the margin by the second phase of funding either. Only during the supplemental phase are the top teams forced to pay more for every additional revenue dollar that they earn; however, since the supplemental phase only accounts for one-third of the pool of shared revenues, the marginal tax rates are not high enough to pose a significant deterrent to payroll spending at the top of the league. Indeed, this is why it is not surprising that seven of the top ten revenue-grossing teams in 2003-04 began the new season with payrolls at or within $2 million of the cap.23

Only in the playoffs funding phase does a deterrent to spending arise. Since the mid-nineties, a trend has developed for clubs performing well in the middle of the season to acquire proven players at the trade deadline in hopes of securing the talent necessary to make a lengthy postseason run.24 Due to the marginal tax rates levied on playoff revenues, each playoff team now keeps a smaller proportion of every dollar that that talent helps create; as a result, the marginal revenue product of a player acquired simply to help a team make and advance in the playoffs falls significantly. In fact, under the new system, profit-maximizing teams in the top revenue echelon will only acquire players at midseason who have the ability to create two dollars of playoff revenue per each payroll dollar remaining on their contract.25 Consequently, the NHL’s style of revenue sharing gives strong incentives for owners of playoff-bound teams to refrain from absorbing contracts via midseason trades aimed at
strengthening Stanley Cup chances. Moreover, the prospect of making the playoffs, in general, becomes less attractive in view of how highly revenues are taxed.

**Competitive Balance**

So what does all of this mean for competitive balance? First, whether or not the NHL had a competitive balance “problem” prior to the signing of the new CBA is a subject of debate. An examination of the concentration of Stanley Cup championships reveals that since 1990, nine different teams have won the Cup, with only two teams, New Jersey and Detroit, capturing the Cup more than twice during that time span. Stanley Cup success has not been confined to the large-market, spendthrift teams, either. In 2004, Tampa Bay won the championship with a payroll of $33.5 million (twenty-five percent below the league average), while Carolina made the Finals two years prior with approximately the same payroll. The calculation of the standard deviation of winning percentage, which measures the within-season variation in win percentages among teams (values present in Table 4), confirms that a healthy degree of parity existed in the league, which is why we are skeptical of claims like that of Tampa Bay Lightning President, Don Campbell, who said, “Getting rich is not the goal [of the CBA]. Every one of these owners really wants a chance to win.”

More often than not, differing opinions about competitive balance are a matter of perspective. If we adopt the definition of competitive balance espoused by the writers of baseball’s Blue Ribbon Panel Report, which essentially says that balance is the fans’ perceived probability that their team will reach the playoffs at the beginning of the season, then the new CBA has positively affected balance without a doubt. This could be observed just by reading the NHL preseason reports in a mix of popular sports publications, which varied so widely in their predictions that any fan could find their respective home team in the playoff hunt in at least one magazine. Despite this change in perceived balance, the NHL’s new revenue sharing system will do little to improve competitive balance statistically, assuming profit-maximization by team owners. Not only is the statistical link between payroll and performance very weak, but sharing also has an enormous negative impact on the marginal revenue product of talent for low-revenue teams—devaluing players by at least 54 percent and possibly more. Although the effect of sharing on the MRPs of high-revenue teams are more difficult to predict and

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**TABLE 4 Standard Deviation of Winning Percentage, 1994-2004***

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</thead>
<tbody>
<tr>
<td>Standard Deviation</td>
<td>0.121</td>
<td>0.111</td>
<td>0.074</td>
<td>0.097</td>
<td>0.092</td>
<td>0.108</td>
<td>0.111</td>
<td>0.095</td>
<td>0.097</td>
<td>0.099</td>
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<td>28</td>
<td>30</td>
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* The ideal standard deviation is 0.06.
incalculable until the league’s year-end financial computations are complete, we expect that it will be substantially less than the effect imposed on low-revenue teams, due to the fact that the diversity of funding sources taxes high-revenue teams less on the margin. The combination of these two effects could lead to a two-tiered payroll distribution, in which the high-revenue teams spend at or near the cap level, while the lower-revenues teams spend near the payroll minimum. In a model like the one depicted in Figure 1, we would expect this arrangement to exacerbate balance, not make it better.

**Profits**

Because the uncertainty of outcome plays a large role in fans’ consumption decisions, it is impossible to discuss revenue sharing and competitive balance without mentioning their implications for profits. As Figure 1 illustrates, the unit cost of talent unambiguously decreases from $c_0$ to $c_1$ in the presence of any form of sharing. With a total decrease in costs equal to the shaded area $(c_0 - c_1) \times t$, NHL team profits must necessarily increase, assuming current revenues to be at least equal to pre-sharing revenues. This, in combination with the payroll cap, which forces teams to spend less than $39$ million on players this year, and the $24$ percent rollback in player salaries, should have more teams seeing black this year on the balance sheet. Unfortunately, the teams that will see the largest gains in profits are the big spending teams that were previously spending far over the new cap level, as they will save millions simply because they are being forced to cut payroll. Meanwhile, the lower-revenue teams that were already spending under $39$ million will experience a less drastic improvement in profits. This increase in profits has an interesting effect on balance. If the league simply allows the poorest performing teams to fold financially instead of devising a system to help them remain viable, balance would increase simply because the worst teams would no longer be in the league. With fewer weak teams on the schedule, the remaining teams would win fewer games, thereby balancing the win percentages within the league. If the folding teams have a below average elasticity of demand with respect to team quality, this will not only improve competitive balance statistically, but also fans of all teams could begin the season with the belief that their team will make the postseason (Noll 2003, 10). The obvious drawback of this strategy would be that fans in the cities whose team went bankrupt would no longer have the opportunity to watch or cheer for a hometown team.

Finally, we should note that a move toward perfect balance, while beneficial to the profits of certain individual teams, is not always optimal for league-wide profits. This is because large cities such as New York and Boston have a greater number of comparable substitutes for hockey games than, say, Nashville or Raleigh-Durham (Carolina). Since this is true, the elasticity of fan demand with respect to winning is be greater in these larger cities than it is in the smaller ones (Porter 1992, 71). In other words, large market teams is draw more additional fans when they perform well and lose more fans when they perform poorly, which suggests that it is actually in the league’s best interest to allow teams like Toronto, Boston, Philadelphia, and the Rangers to “dominate” to some degree. If, indeed, the payroll cap and revenue sharing enhances balance to such a degree that these teams become “one of the
bunch” (Quirk and Fort 1995, 1281), some of their fans might begin to lose interest, which will cause league-wide revenues and thus league-wide profits to decline.

**Conclusion**

Despite the optimism of team owners regarding the NHL’s new revenue sharing agreement, the new financial arrangements might not produce the predicted effects that league and player representatives intended, particularly concerning competitive balance. The system imposes no significant deterrent to spending by the top revenue-grossing teams, nor does it provide adequate incentives for teams receiving a transfer to spend that money on more or better playing talent. In combination, these two effects should actually exacerbate balance in a profit-maximizing league; therefore, if parity does increase, it will likely be due to payroll compression at the top of the league due to the salary cap, not additional spending by teams at the bottom due to revenue sharing. It should be kept in mind, however, that all of these conclusions are based entirely on a theoretical framework. The existence of a good model does not change the fact that it is impossible to predict the behavior of team owners in the real world. While some owners are profit-maximizers as we assume in our analysis, others surely prefer to maximize wins, while others base their behavior on finding the most preferable combination of the two (utility-maximizers). These differences in owner preferences may cause the NHL’s actual experience with revenue sharing and the new economic system to be different than what we espouse here. Still, our predictions offer a good starting point for future analysis.

**Notes**

1. Nielsen Media Research. The five games referenced were those broadcast on the ABC network. Games 1 and 2 were broadcast on the cable network ESPN and were, therefore, not included in the ratings average.

2. Competitive balance is a nebulous term, with the number of different definitions rivaled only by the number of different methods economists use to measure it. The definition that has taken hold most recently is used in the 2000 Baseball Blue Ribbon Panel Report, which defined competitive balance as “a regularly recurring reasonable hope of reaching post-season play” (Levin et al. as cited in Ross 2000). Interestingly enough, this definition has its roots in a hockey court case. See *Philadelphia World Hockey Club, Inc. v. Philadelphia Hockey Club, Inc.* for more detailed information (Ross 2002).

3. Collective Bargaining Agreement Between NHL and NHLPA, Article 49.1k, July 22, 2005

4. The payroll midpoint is established before each season and is equal to 50 percent of the payroll range. For example, if the payroll range is between $24 and $40 million, the midpoint would be $32 million.

5. *CBA*, Article 49.3b.

6. In order to ensure that the players receive exactly 54 percent of total league-wide revenues, the league will use an escrow accounting system. Revenues will be totaled in regular intervals during the season, and if those totals reflect that player salaries comprise greater than 54 percent of revenues, players will have the percent overage withheld from their paychecks and deposited into their team’s escrow account. If there is
still an overage at the end of the season, the money in each team’s escrow account will be paid to the league and then refunded to the teams in a manner agreed upon in the CBA.

7. *CBA*, Article 49.5a-b.

8. *CBA*, Article 49.5c.


10. *CBA*, Article 49.5d.

11. *CBA*, Article 49.3d.

12. Teams who do not meet these performance standards face graduated punishment. First time “non-performers” will see their allotted transfer reduced by 25 percent. Clubs that fail to meet the performance standards in two sequential years will face a 40 percent reduction, while those that fail to perform for three consecutive years will receive only half of their allotted transfer.

13. Beginning in 1999-2000, the NHL’s point system was changed to give teams one point for overtime losses as well. In order to keep each team’s point total during these seasons on a basis that is precisely comparable to other years, point data in the seasons following this change was deflated to reflect the additional points available under the new system. Additionally, point data for the strike-shortened 1994-95 season was inflated by a factor of 82/48, as only 48 games were played.

14. Data for Nashville (’98-’99), Atlanta (’99-’00), Columbus (’00-’01), and Minnesota (’00-’01) was eliminated in each team’s respective expansion season. Expansions teams almost always perform poorly in their inaugural season and including this data could have biased the regression calculations.

15. Payroll data was obtained from Rodney Fort’s website, http://www.rodneyfort.com/SportsData/BizFrame.htm.

16. Although this is generally true, there are exceptions. Steve Yzerman, 40, and Jaromir Jagr, 34, both come to mind as players who continue to be top performers beyond their thirtieth birthdays.


18. A player’s marginal revenue product is defined as his incremental contribution to team revenues. Mathematically speaking, it is the product of a player’s marginal product (the number of additional games a player’s team wins due to his performance) and marginal revenue (the monetary value of those additional wins). For more on MRP, see Scully (1974).

19. Adapted from Marburger (1997).

20. The NHL would not disclose actual revenue figures.

21. Due to the fluidity of the game, the performance of a hockey team, unlike that of a baseball team, cannot be viewed as a mere linear summation of individual player performances; as a result, isolating an individual player’s incremental revenue contribution (MRP) independent of cross-player complementarities may be difficult. Nevertheless, Richardson (2000) provides a model for measuring hockey players’ marginal revenue product, so our example will assume that hockey teams have the ability to calculate an individual’s incremental contribution within reasonable approximation of their actual MRP.
22. Assuming Cole will not want to play for a salary that is so much lower than his MRP, he will likely be forced to accept his next best offer, even if his marginal revenue contribution in that city is less than it is in Carolina. The result is a welfare loss in the amount of the difference between $2 million and his MRP to his new team.

23. Payroll data for 2005-06 season is estimated from Bernstein.

24. Zimbalist (2003) proved the existence of this trend by comparing the correlation between winning and payroll, both at opening day and at the trade deadline. He found that there was a stronger correlation between winning and trade deadline payroll, suggesting that causation between the two variables actually runs in the counterintuitive direction. That is, having a winning team leads to a higher payroll.

25. This is true because the top ten revenue teams who make the playoffs must donate 50% of their playoff revenues to the shared revenue pool. For teams in the middle and bottom thirds in revenues, who contribute 40% and 30% of their playoff revenues, respectively, a player would have to create $1.67 and $1.43 in revenue per each payroll dollar for the team to break even in the transaction.

26. The standard deviation of win percentage is defined as ratio of wins to total games played, with a smaller dispersion indicating a greater degree of parity among teams. In a perfectly balanced league, one in which each team has a 0.5 probability of winning each game, the dispersion of wins can be calculated by \(0.500/\sqrt{G}\), where \(G\) is the number of games played by each team in a season (Humphreys 2002).

27. Bernstein.


References


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