League Equivalencies

What's a goal in one league worth in another? NHL teams draft and sign players from numerous major junior leagues, US and Canadian colleges, European Elite Leagues and various North American minor leagues. In evaluating players, it is critical to know how a player's performance will translate to the NHL. Other things being equal, the quality of one league relative to another is reflected in how many points a player would score in each league.

Research has shown that while NHL players' playing time and point scoring peaks between ages 23 and 26, their point-per-game (PPG) production reaches 90% of its peak value much earlier, and holds its value beyond age 30. It is rare that a player plays significant time in two leagues in the same year, but players often play in one league in one year and another the next. With a large number of such players, we can then estimate the quality of each league using the ratio of the player's PPG in each year.

What we are most interested in is what one point in a given league is equivalent to in the NHL – in other words, the league equivalency. There is enough data to use the above method to estimate the league equivalence for the best minor leagues (AHL/IHL), most major professional leagues (European Elite Leagues) and the WHA.

Minor Leagues

With the demise of the International Hockey League, the AHL is now the top minor professional league in North America. But how good is it? Obviously, there are no serious games between NHL teams and their AHL affiliates. But there are plenty of players every year who play a full season in the AHL and then play a full season in the NHL. In fact, among players born between 1960 and 1980, there have been 473 of them (and 129 from the now-defunct IHL.)

One of the most resilient qualities of a player is his points-per-game (PPG). For the PPG production of players born after 1948 reaches its 90% level at age 21 or 22, and does not fall below that level until age 30 or 31, provided the player is still active. To determine the quality of the AHL (or any other league), we can simply look at every player who spent year one in a minor league and year two in the NHL and compare their PPG averages. In other words, the league quality relative to the NHL is:

$$Quality_{LEAGUEX} = \frac{PPG_{NHL}(yr2)}{PPG_{LEAGUEX}(yr1)}$$

The following chart shows the relative PPG averages for players of various ages who played 40 or more games in the minors in one year, and 40 or more games in the NHL the following year:

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Age	20	21	22	23	24	25	26
AHL	0.49	0.46	0.47	0.41	0.33	0.36	0.42
N	97	89	70	56	32	23	17
IHL	0.49	0.47	0.49	0.47	0.41	0.32	0.31
N	15	24	19	15	19	11	10

Surprisingly, there was no significant statistical difference between the quality of the AHL and the IHL, even though very few IHL players were good enough to play in the NHL.

The approximate league quality for both minor leagues is 0.45. In an 82-game season, we would expect a team with this level of offensive production to get about 14 points in the standings. The worst ever first-year NHL expansion team was the Washington Capitals, who went 8-67-5 for 21 points in 1974-75. The minor-league estimates make sense: even the worst expansion team, which had no more than four or five legitimate NHL players, is three or four wins better than the average AHL team, which typically has no legitimate NHL players (otherwise they'd be in the NHL.)

World Hockey Association

The World Hockey Association is the only competing professional league the NHL has faced since the PCHA and WCHL folded in the mid-1920s. In its first season, 1972-73, the WHA was barely better than most minor pro leagues. Thirty-nine previous or future regular NHL players played at least 40 games in that inaugural WHA season, compared to more than 200 career minor leaguers who filled out the rosters of the 12-team league. Overall, the 1972-73 WHA was comparable to that of the American Hockey League. This is not surprising, since the WHA mined the AHL to fill out its teams.

Year	72-73	73-74	74-75	75-76	76-77	77-78	78-79
WHA	0.46	0.76	0.70	0.88	0.55	0.65	0.89
N	39	20	21	16	10	14	59
AHL	0.43	0.44	0.58	0.56	0.43	0.58	0.49
N	21	31	16	21	24	22	22

As the WHA began to steal away top NHL draft picks, recruit more established NHLers, and sign skilled European players, it was almost as good as the NHL. It played a high-profile 1974 Summit Series against European teams. In 1977 and 1978, WHA teams played 47 exhibition games against NHL teams, posting a 28-13-6 record – though the Stanley Cup champion Montreal Canadiens declined to participate. It signed many future NHL stars such as Wayne Gretzky, Mark Messier and Mike Gartner. But in 1979, the WHA was in serious financial trouble, and it "merged" with the NHL without ever having the opportunity to pass its competitor.

European Professional Leagues

The NHL began its first tentative forays into Europe in the 1970s, with mixed success. The accuracy of European statistics from that era is suspect, but has improved since

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Europeans entered the NHL on a large-scale in the early 1990s. The following table shows the relative quality of the major European professional hockey leagues:

League	Quality	N
Russian Elite League	0.91	47
Czech Republic League	0.61	35
Swedish Elite League	0.59	72
Finland SM-Liiga	0.54	75
AHL/IHL	0.45	
Switzerland National League	0.40	28
Deutsche Eishockey League	0.37	19
NCAA	0.33	93

This confirms what we know about European hockey – Russia has produced the best players, while the Czechs, Swedes and Finns have high-quality leagues that allow their best professionals to step directly into the NHL. Germany and Switzerland are clearly well below the level of the six-best countries in the world. The World Championships make it clear that an AHL All-Star team is nearly as good as the Swiss or German National teams, and, barring a miracle, better than an NCAA All-Star team.

League Equivalencies in Practice?

The San Jose Sharks cut their payroll from $48.6 million in 2001-02 to $34.5 million in 2003-04, while NHL salaries rose 16% overall. Despite shedding 30% of their payroll, they finished first in the Pacific division both seasons (though they missed the playoffs in 2002-03, while they were rebuilding the team.) The Sharks were able to sign, draft or promote several key players to the NHL from college or the minor leagues, giving them the same offensive production at a much lower price than they would have paid for veteran players. The five players listed below were not considered top prospects (only Cheechoo was drafted in the first four rounds), but they were nonetheless useful players to the Sharks, and they performed approximately as well as they could be expected to:

Player	Age	League Yr 1	PPG Yr 1	NHL PPG	Exp. PPG
Nils Ekman	27	AHL	1.16	0.67	0.52
Jonathon Cheechoo	22	AHL	0.87	0.24	0.39
Niko Dimitrakos	24	AHL	0.80	0.35	0.36
Tom Preissing	25	NCAA	1.24	0.28	0.41
Jim Fahey	23	NCAA	1.18	0.47	0.39

18- and 19-year-old Players

Most young players don't make a direct transition from Major Junior hockey to the NHL, transitioning instead via a minor league such as the AHL. The league equivalencies for the three top Canadian Junior leagues with respect to the NHL and the AHL for players born 1948-1986 are shown below:

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	WHL	N	OHL	N	QMJHL	N
To AHL	0.43	302	0.45	295	0.41	135
To NHL	0.30	143	0.30	205	0.28	62

The AHL-NHL league equivalency implied by these results can then be compared to the observed equivalency of players moving from the AHL to the NHL directly at age 18 and age 19:

	LgEq	N
Implied	0.68	
Observed	0.65	154

Because younger players improve much more rapidly than older players, the AHL league equivalency is much higher for junior-age players than for players in their 20s.

Reduced Power-Play Time

For good offensive players coming from weaker leagues (such as the AHL, the NCAA or the 1972-73 WHA) this method underestimates their performance. These players get much less power play time in the NHL than in the weaker league, and their NHL production is lower as a result. 71 players played more than 40 games in the AHL in 2002-03 and at least one game in the NHL in 2003-04:

	GP	G	A	P	PPG	SHG
AHL 2002-03	4614	1559	2255	3814	541	88
NHL 2003-04	1892	279	368	647	59	15

Obviously many of these players don't succeed at higher levels of play, hence their average of less than 30 games in the NHL. Here are their points-per-game and even-strength-goals-per-game in both leagues:

	P/G	ESG/G
AHL 2002-03	0.83	0.2
NHL 2003-04	0.34	0.11
Ratio	0.41	0.54

Ignoring the reduction in power play time clearly underestimates the quality of the AHL, which is likely 20-30% higher than estimated in earlier sections. For higher-quality leagues such as the Russian Elite League, this difference is much less significant.