Best QBs of the Modern Era

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2024-02-28

How to define quarterback success if a tricky question. There are traditional statistics like passing yards, touchdowns (TDs), and interceptions (INTs) that are quite interpretable, but can be noisy for smaller sample sizes and depend heavily on dropbacks. Using TD-INT ratio and yards per attempt (YPA) are a step forward, as these rely more on efficiency. Passer rating isn't bad as well, however there are better, more advanced stats. Adjusted net yards per attempt takes YPA and adjusts for factors like sacks (proven to be largely the QB's fault), as well as more weight to TDs and INTs. To go even further, expected points added (EPA), was developed. EPA derived from the concept of expected points – first introduced by Vigil Carter in 1970 (*EPA Paper*). A model based on game situation, field placement, etc. calculates the expected points for the situation of the team. The change from this play to the next is the expected points added. Many critic this metric because of it's lack of separation from QB and offensive play as a whole. However, EPA is most predictive of who is winning the game and all stats are somewhat team based. For example, a QB will have more passing yards if they have better receivers. That's where PFF grading can come in.

Pro Football Focus grades QBs on every play on a scale of -2 to 2, depending on whether that QB did something good, bad, or neutral. This metric is great at isolating QB play and is fairly stable from year-to-year. However, there are still biases and value being missed from these QBs. For example, ~60% of plays are graded as 0. A QB is always having some impact, positive or negative, on a play. To completely remove that on over half the plays really misses out. Also, *I believe* sacks aren't a part of the grading. Thus, while this metric is best for isolating QB play, the actual value of the QB play is being missed.

ESPN's QBR does a good job as well. This metric predicts the likelihood the QB is actually having a positive impact on a scale from 0 to 100. However, this metric is worse at predicting wins than EPA and is less stable year-to-year than both EPA and PFF grade (*Robby*). Other important metrics of QB play include completion percentage over expected (CPOE) and pressure-to-sack rate (PTSR). The first one is very stable year-to-year, but only measures accuracy. Also, there have been critiques on if it's best to actually maximize CPOE versus taking more risks. On top of that, critics have also been put on how well we are able to measure accuracy altogether. Lastly, PTSR shows how well a QB is at avoiding sacks given their situation. The elite QBs consistently show up well here and it translates well from college to pro.

With that being said, it was Ben Baldwin who once said "[about] 95% of [how good a QB is can be determined from] looking at EPA (expected points added) and PFF (Pro Football Focus) grade." Thus, we will look at an EPA/play and PFF grading composite to help determine the best QBs of this era.

I used nflfastR, PFF, and ESPN data since 2006. Each QB has to have at least 400 plays in their career and 150 plays per season to be considered. This will allow us to look at QBs who didn't play a lot, either because they are young or bad, as well.

By Career

Best Overall

Best QB Career Performances
2006-2023 | 150+ single season dropbacks | 400+ career dropbacks

player	Percentile[1]	EPA/Play	Avg. Grade	Plays
Patrick Mahomes	0.99	0.25	89.5	5110
Brock Purdy	0.99	0.28	82.3	930
Peyton Manning	0.98	0.21	86.4	6260
Aaron Rodgers	0.98	0.21	86.5	10170
Tom Brady	0.98	0.20	86.6	12500
Drew Brees	0.97	0.18	86.1	10370
Jordan Love	0.95	0.15	83.6	840
Josh Allen	0.95	0.16	82.4	4610
Joe Burrow	0.94	0.12	84.2	2600
Philip Rivers	0.93	0.16	79.2	9770
Justin Herbert	0.93	0.11	83.3	2920
Dak Prescott	0.93	0.15	80.0	5060
C.J. Stroud	0.92	0.11	83.1	660
Russell Wilson	0.92	0.12	81.8	8000
Matt Ryan	0.91	0.12	80.1	10220
Lamar Jackson	0.90	0.13	78.6	3530
Tony Romo	0.90	0.14	77.3	5160

[NA] By: Sam Burch – Data: nflfastR & pff
[1] The ranking is ordered by this percentile – 50-50 composite of epa/play and grade.

Mahomes is atop here with him having the second best EPA/play and best average grade since 2006. Purdy, boosted by his amazing EPA and short sample size in a great situation, is second. Purdy's average grade is worse at 11th, but that is still really good. Three historical greats – Manning, Rodgers, and Brady – round out the top five respectively. Each of the three are top five in EPA and grading, with Manning best in EPA (3rd) and Brady best in grading (2nd). Next comes another historical great (Brees) and another small sample guy (Love). Allen, Burrow, and Herbert (modern greats with large enough sample sizes) follow, with Rivers squeezing in between Burrow and Herbert. Allen is top ten in EPA and grading, however Burrow and Herbert are 18th and 19th respectively in EPA.

A couple of QBs who arguably should be lower are Russell Wilson (14th), Jimmy Garoppolo (19th), Deshaun Watson (21st), Tua Tagovailoa (22nd), and Jameis Winston (29th). Russell Wilson has not had a good past two years, but this is based on career play. He's 16th in EPA/play and 12th in grading over his nearly 8000 career dropbacks; that's elite play. Jimmy G. is perhaps the original Purdy, although Garoppolo has had fairer criticism. Jimmy G. was benched for rookie A.O.C. this past year and has always been seen as not as great as his production. His EPA is 7th with his grading being 30th. Obviously, that's a large discrepancy, but (due to the limitations of each metric) he's likely somewhere in between. Meaning, Garoppolo should be lower, but still higher than public perception. For Watson, I will not be diving into his play (*see references*). Tua has also been seen as someone lifted by their surroundings, however his efficiency and grading are both 22nd. It will be interesting to see how his play progresses after his rookie deal is up, and the team around him is no longer as good. Flamis Jameis knows how to take risks, with his efficiency being 24th, despite him 43rd in grading.

Average

"Average" QB Career Performances
2006-2023 | 150+ single season dropbacks | 400+ career dropbacks

player	Percentile[1]	EPA/Play	AVG. Grade	Plays
Teddy Bridgewater	0.75	0.07	71.5	2550
Carson Wentz	0.75	0.06	72.5	4100
Baker Mayfield	0.75	0.06	72.5	3600
Jared Goff	0.74	0.07	70.6	5060
Kurt Warner	0.73	0.09	68.8	2130
Tyrod Taylor	0.72	0.04	72.2	2440
Trevor Lawrence	0.71	0.03	72.6	2230
Brett Favre	0.70	0.07	68.6	3000
Donovan McNabb	0.70	0.06	69.7	3040
Eli Manning	0.70	0.05	70.4	8720
Andy Dalton	0.70	0.04	71.2	6650
Marcus Mariota	0.70	0.06	68.8	2860
Sage Rosenfels	0.66	0.08	65.2	500
Joe Flacco	0.65	0.04	68.8	8120
Jacoby Brissett	0.65	0.02	70.1	2040
Alex Smith	0.65	0.04	68.3	6450
Kenny Pickett	0.64	-0.01	73.0	890
Geno Smith	0.63	0.01	70.0	2640
Gardner Minshew	0.63	0.04	66.8	1740
Shaun Hill	0.62	0.02	69.3	1420
Colin Kaepernick	0.62	0.08	63.3	2540
Matt Barkley	0.62	-0.03	73.0	400
Chad Pennington	0.62	0.06	64.2	1580
Ryan Fitzpatrick	0.61	0.04	66.4	5930
Daniel Jones	0.61	-0.01	70.8	2610

[NA]By: Sam Burch – Data: nflfastR & pff

[1]The ranking is ordered by this percentile – 50-50 composite of epa/play and grade.

The thought of an average QB would lead to a practical presumption of the 50th percentile here. This is not the case however, because this sample includes perennial backups and busts. This includes players like Mitchell Trubisky (60th percentile), Sam Bradford (54th), Justin Fields (53rd), Brian Hoyer (47th), and Blake Bortles (42nd). When we instead restrict the sample to 1500 career dropbacks, this reduces the sample from 90 to 78, eliminating many unproven player and aforementioned backups and busts. The average is 67th percentile and median is 70th. With this new definition for "average" QB, we can look at the bigger sample and see players like Jared Goff (74th), Eli Manning (70th), Andy Dalton (70th), Joe Flacco (65th), and Geno Smith (63rd). While all are not consistently "average" QBs, this definition certainly makes more sense. Some surprising names in this range include Kurt Warner (73rd) and Trevor Lawrence (71st). Warner's explanation is the sample includes data from 2006 on – his last four years. Lawrence had a very rocky rookie season (24th percentile) but bounced back the past two years with 67th and 74th percentile performances respectively. These are not elite numbers because Lawrence has had an issue with consistency, however adjusted EPA numbers (Ben Baldwin) show his performance this past year was probably better than this.

Bad

Worst QB Career Performances
2006-2023 | 150+ single season dropbacks | 400+ career dropbacks

player	Percentile[1]	EPA/Play	AVG. Grade	Plays
John Skelton	0.01	-0.22	35.5	700

Andrew Walter	0.01	-0.35	48.2	420
Josh Rosen	0.01	-0.32	49.1	630
JaMarcus Russell	0.03	-0.23	48.0	820
J.P. Losman	0.06	-0.12	43.7	880
Blaine Gabbert	0.07	-0.17	49.4	1960
Charlie Frye	0.07	-0.17	49.5	650
Jimmy Clausen	0.07	-0.28	60.5	570
Brady Quinn	0.07	-0.19	52.6	650
DeShone Kizer	0.09	-0.17	52.5	680
Daunte Culpepper	0.09	-0.14	50.2	750
Trent Green	0.10	-0.11	47.9	510
Bryce Young	0.10	-0.18	56.0	660
Zach Wilson	0.11	-0.16	54.7	1240
Kyle Boller	0.11	-0.17	55.5	670
Brad Johnson	0.12	-0.20	58.9	620
Bruce Gradkowski	0.13	-0.18	58.4	860
Dwayne Haskins	0.15	-0.16	58.1	540
EJ Manuel	0.16	-0.10	53.0	750
Josh Johnson	0.17	-0.06	50.3	500
Desmond Ridder	0.17	-0.08	51.9	630
Rex Grossman	0.17	-0.10	54.3	1640
Derek Anderson	0.18	-0.10	54.5	1890
Trevor Siemian	0.18	-0.07	52.3	1440
Gus Frerotte	0.18	-0.13	57.4	550
Kyle Allen	0.18	-0.04	49.7	850
Drew Stanton	0.19	-0.07	52.6	800
Mike Glennon	0.19	-0.11	57.0	1350
Kellen Clemens	0.19	-0.11	57.3	790
Austin Davis	0.19	-0.14	60.2	460
David Carr	0.20	-0.08	54.6	800

[NA]By: Sam Burch – Data: nflfastR & pff
[1]The ranking is ordered by this percentile – 50-50 composite of epa/play and grade.

Looking at the worst QBs, we have players like Josh Rosen (1st percentile), Blaine Gabbert (7th), DeShone Kizer (9th), Zach Wilson (11th), and Trevor Siemian (18th). None of these names are likely surprising. Rosen and Kizer each played one awful year. Gabbert's best year was in 2015 with a 29th percentile performance. One player of note in this range is Bryce Young (10th percentile). Young had a dreadful surrounding cast in his rookie season, but being drafted 1st overall last year suggests he should be given more of a chance. Most of these players didn't play much at all in the NFL. The average number of seasons (again with the 150 play cutoff) for QBs in the 25th percentile or below is just 2.03, compared to 3.94 for the whole sample. Thus, to not dread on small samples and bad play, let's move on to the best seasons in this dataset!

By Season

Best QB Single Season Performances
2006-2023 | 150+ dropbacks

player	year	Percentile[1]	EPA/Play	AVG. Grade	Plays
Tom Brady	2007	0.99	0.38	93.9	730
Aaron Rodgers	2011	0.99	0.37	92.7	640

player	year				
Aaron Rodgers	2020	0.98	0.33	95.1	660
Matt Ryan	2016	0.98	0.34	92.2	700
Patrick Mahomes	2018	0.98	0.32	92.9	720
Aaron Rodgers	2014	0.98	0.31	93.3	650
Tom Brady	2016	0.98	0.29	94.9	610
Drew Brees	2018	0.98	0.30	94.0	590
Drew Brees	2011	0.98	0.31	93.2	810
Peyton Manning	2013	0.97	0.30	92.9	810
Philip Rivers	2009	0.97	0.31	90.9	560
Josh McCown	2013	0.97	0.36	86.4	240
Patrick Mahomes	2019	0.97	0.32	90.0	660
Ryan Tannehill	2020	0.97	0.31	90.6	560
Tom Brady	2017	0.97	0.27	94.1	770
Patrick Mahomes	2022	0.97	0.29	92.0	840
Peyton Manning	2007	0.97	0.26	94.4	580
Jimmy Garoppolo	2017	0.96	0.33	86.6	190
Tom Brady	2011	0.96	0.31	88.9	770
Patrick Mahomes	2020	0.96	0.27	91.8	780
Tom Brady	2020	0.96	0.24	93.3	780
Brock Purdy	2023	0.96	0.31	87.0	580
Peyton Manning	2012	0.96	0.26	91.1	660
Peyton Manning	2009	0.96	0.29	88.5	720
Lamar Jackson	2019	0.96	0.27	90.1	540
Drew Brees	2009	0.96	0.30	87.7	640
Tom Brady	2012	0.96	0.27	90.2	760
Aaron Rodgers	2016	0.96	0.26	91.4	830
Peyton Manning	2006	0.95	0.23	92.6	740

[NA]By: Sam Burch – Data: nflfastR & pff

[1]The ranking is ordered by this percentile – 50-50 composite of epa/play and grade.

2007 Brady has the best year out of 730. Brady had a 0.38 EPA/play (1st) and 93.9 grade (6th)! This led to an undefeated season, however an unfortunate loss in the Superbowl. (The best teams don't always win.) Rodgers 2011 and 2020 seasons come next. Rodgers was more efficient during 2011 (2nd vs. 6th) but better grading-wise in 2020 (12th vs. 1st). Next comes Matt Ryan's MVP season and Mahomes' first season. Both had elite efficieny and great grading. Drew Brees' 2018 and 2011 seasons also crack the top ten. Both had top ten grading and top-15 efficiency. Manning squeaks into the top ten with his 2013 season – 16th in efficiency and 11th in grading. Josh McCown's 2013 season was perhaps the best season in the dataset on a small sample at 12th best. His efficiency was 3rd (!) but boasted the 76th best grade. Jimmy Garoppolo's first season as a starter, in 2017, gave him the 18th best season; this was again a small sample. Besides these few outliers along with Lamar's MVP, Ryan Tannehill's 2020, and Purdy's 2023, all of the top 30 season are by consensus all-time greats!

Average QB Single Season Performances
2006-2023 | 150+ dropbacks

player	year	Percentile[1]	EPA/Play	AVG. Grade	Plays
Matt Hasselbeck	2010	0.52	-0.01	74.1	570
Kyler Murray	2023	0.51	0.02	71.0	300
Kirk Cousins	2017	0.51	0.03	70.0	610
Derek Carr	2022	0.51	0.06	66.6	540
Jacoby Brissett	2021	0.50	-0.04	76.3	260
Chad Henne	2009	0.50	0.02	70.1	480

Daniel Jones	2021	0.50	0.01	71.1	410
Carson Palmer	2011	0.50	0.06	66.3	350
Taysom Hill	2020	0.50	0.05	67.7	160
Justin Fields	2023	0.50	-0.03	74.6	460
Cam Newton	2020	0.50	0.01	70.9	420
Carson Wentz	2016	0.50	0.02	69.9	660
Tyrod Taylor	2023	0.50	0.01	71.4	220
Troy Smith	2010	0.50	0.01	71.2	180
Alex Smith	2018	0.50	0.02	70.2	370
Jason Campbell	2010	0.50	0.05	67.1	390
Josh McCown	2017	0.49	0.04	67.9	460
Eli Manning	2008	0.49	0.08	64.3	540
Kerry Collins	2008	0.49	0.05	66.3	470
Mitchell Trubisky	2020	0.49	0.08	63.5	370
Sam Bradford	2013	0.49	-0.02	72.6	280
Sam Bradford	2012	0.49	0.01	70.4	600
Gardner Minshew	2019	0.49	0.01	70.5	560
Tarvaris Jackson	2008	0.48	0.05	65.9	220
Matt Hasselbeck	2011	0.48	0.02	69.3	540
Andy Dalton	2020	0.48	0.01	69.9	380
Carson Palmer	2009	0.48	0.06	65.3	550
Carson Palmer	2013	0.48	0.03	67.9	620

[NA]By: Sam Burch – Data: nflfastR & pff
[1]The ranking is ordered by this percentile – 50-50 composite of epa/play and grade.

Some average seasons – this time 50th percentile makes sense – include Sam Bradford's 2015 (54th percentile), Dak Prescott's 2017 (53rd), Carson Palmer's 2011 (50th), Alex Smith's 2018 (50th), Gardner Minshew's 2019 (49th), Derek Carr's 2017 (47th), and Justin Fields 2022 (47th). These all make sense as they are either up-and-down seasons or strictly mid. For reference, the average grade for the 45th through 55th percentile is 70. The average efficiency her is 0.03.

Worst QB Single Season Performances
2006-2023 | 150+ dropbacks

player	year	Percentile[1]	EPA/Play	AVG. Grade	Plays
Mike Glennon	2021	0.00	-0.41	30.0	180
Ryan Lindley	2012	0.00	-0.45	37.2	180
Trevor Siemian	2023	0.01	-0.30	34.9	170
Zach Mettenberger	2015	0.01	-0.34	38.4	180
JaMarcus Russell	2009	0.01	-0.38	42.9	290
John Skelton	2012	0.01	-0.30	35.1	220
Mike Vick	2014	0.01	-0.28	35.3	150
Jared Goff	2016	0.01	-0.35	42.9	230
Blaine Gabbert	2011	0.01	-0.20	31.2	480
Derek Anderson	2009	0.01	-0.37	49.4	190
Andrew Walter	2006	0.02	-0.33	48.2	330
Kyle Boller	2009	0.02	-0.36	51.1	200
Bailey Zappe	2023	0.02	-0.34	52.2	250
Josh Rosen	2018	0.03	-0.29	49.1	450
John Skelton	2011	0.03	-0.15	35.8	320
Trent Dilfer	2007	0.03	-0.37	57.6	250
Brady Quinn	2012	0.03	-0.30	50.9	230

Alex Smith	2007	0.03	-0.29	52.0	220
Bruce Gradkowski	2006	0.03	-0.24	47.8	380
Curtis Painter	2011	0.03	-0.18	41.4	270
Blaine Gabbert	2017	0.04	-0.20	45.4	210
Bryce Petty	2016	0.04	-0.23	48.2	150
Kirk Cousins	2013	0.04	-0.26	51.4	160
Jake Delhomme	2010	0.04	-0.27	53.3	160
Ryan Tannehill	2018	0.04	-0.18	45.3	320
Matt Moore	2010	0.05	-0.21	49.6	160

[NA]By: Sam Burch – Data: nflfastR & pff

[1]The ranking is ordered by this percentile – 50-50 composite of epa/play and grade.

Some bad seasons with decent playing time include Blaine Gabbert's 2011 (1st percentile), Josh Rosen's 2018 (3rd), Bruce Gradkowski's 2006 (3rd), Matthew Stafford's 2009 (5th), and Mark Sanchez's 2012 (6th). The average grade for 10th percentile or less is 48.37, and the efficiency is -0.21. The worst grade in the dataset belongs to Mike Glennon's 2021 (30), and the worst efficiency belongs to Ryan Lindley's 2012 (-0.45)

## All-Time Greats Comparison
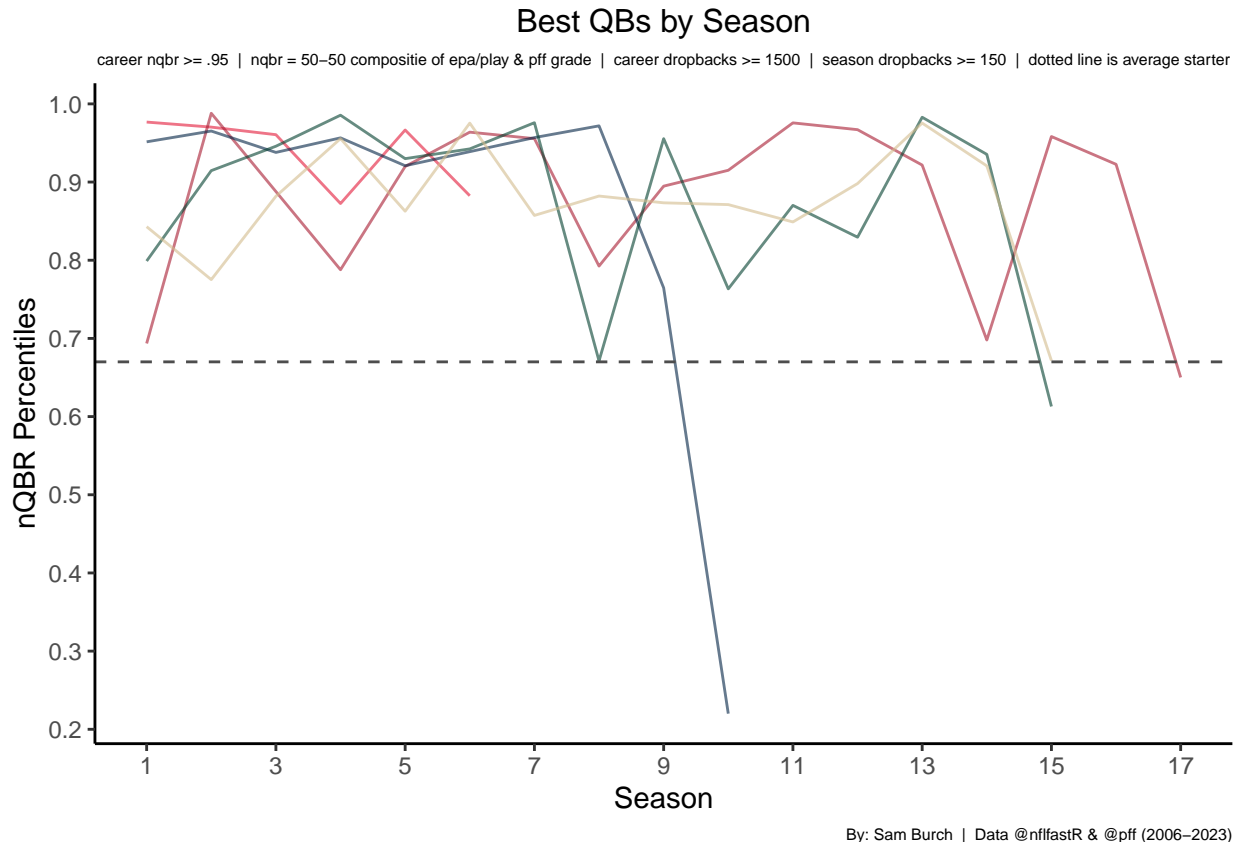
When restricting to at least 1500 dropbacks since 2006, the top-five in the efficiency and grading composite are Mahomes, Manning, Rodgers, Brady, and Brees – respectively. Mahomes has been great on the smallest sample of these five, but he's been the best. He's only dipped below the 90th percentile twice, and has still been above the 85th in those seasons! Manning has arguably been the most similar to Mahomes by having elite after elite year, until his last two. In fact, Manning's 2015 saw him not only dip below average, but to

bad; he still won a superbowl that year, on the back of a great defense. Rodgers bounces around some more – two seasons below average and four below 80th percentile – however is helped by some of the best seasons in this dataset. Rodgers has the 2nd, 3rd, and 6th best season in this dataset, while no other QB here has more than two – Brady and Brees. Speaking of the consensus GOAT, Brady is hurt by five seasons of worse than 80th percentile play, but he only dropped below average once. Mentioned earlier too, Brady had the best season in this dataset back in 2007. Lastly, while Brees may not be looked upon as elite as some of these players, he is very consistent. Brees fell below 80th percentile only once before his last season and had just four seasons of at least 90th percentile play. Being this consistently elite, along with having two top-ten seasons, brings him into this top-five.

Now, who is actually the best of these five? It is tough to say with this dataset because we restricted the careers of Brees, Brady, and Manning. We do know though that Mahomes has been the best over this span in terms of best EPA (0.25) and best average grade (89.5). Both of these numbers are in their own tier, so it is safe to say Mahomes is on track to be the GOAT. Manning's numbers would look more similar if he didn't have that fall off. On top of that, missing value for him and Brady probably puts them in a tier of their own as tied for the current GOAT. In fact, Kevin Cole has analysis that puts Manning ahead of Brady using more historical data (*Kevin Cole*). Rodgers was really good, as mentioned. However, him not having as long of a career puts him just a tier below with Brees. Thus, I my personal rankings, based on this analysis, would be the following: - Mahomes (on track) - Manning / Brady (Current GOATs) - Rodgers / Brees (Top-10-OAT)

Heading into 2024

Before we wrap up, let's look at the QBs heading into next season.
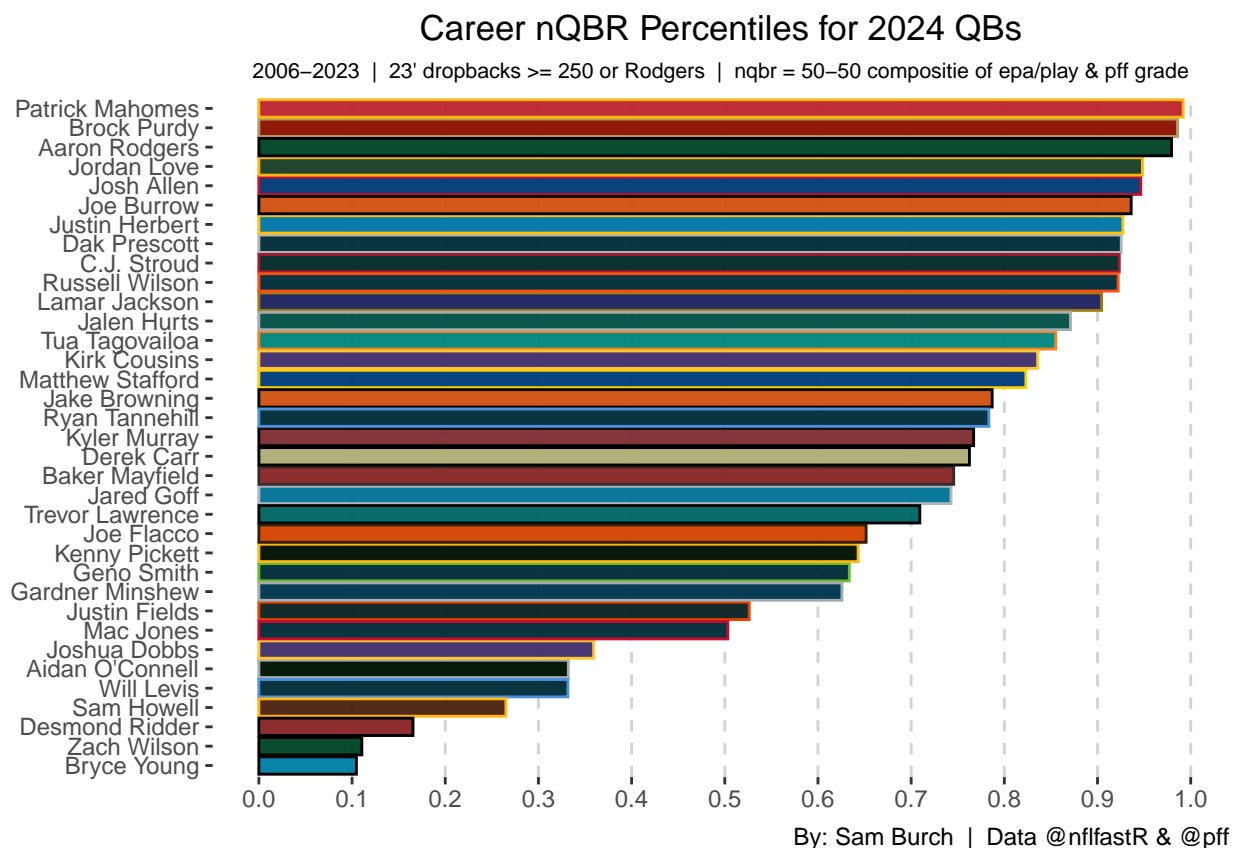
Mahomes is the best QB, duh, but Purdy and Rodgers are interesting. Purdy still has an amazing cast, but

perhaps another elite season definitely will put him higher in public perception. Rodgers will have to battle from not only his worst season two years ago, but also an ACL injury at age 40. Another year of Love and Stroud will show who can stay elite. Russell Wilson and Kirk Cousins (now on different teams) may be able to provide a spark. Will more help around Young and Levis spring them into a sophomore breakout? As a Panthers fan, I'm optimistic about Young, because of his elite college play. For Levis, the better situation should help, but he's had a problem with sack avoidance ever since college.

What will shake up these rankings a lot next year are the rookies. There are 6 QBs in the top 50 on the consensus board (Jack). To add more context to how these college players will perform, I will update my model from last year and project them into the NFL. Stay tuned, and thanks for reading!

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Other