

# Introduction to Finance

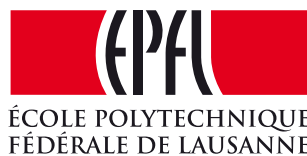
## FIN-401

Working results of case study

*Tottenham Hotspur plc*

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## Introduction

This report serves in demonstrating our analytic results of financial situations of the football club *Tottenham Hotspur plc*. The club is considering building a new stadium or/and signing a new striker, or continuing current situation. Our goal is to evaluate these different projects and provide suggestions of accepting or rejecting available projects.

We are provided with lots of accounting materials such a balance sheet and an income statement of year 2007. To investigate different projects, we mainly follow the idea covered in lectures, i.e, we abstract the overall cash flow of a project and calculate the net present value (NPV). We accept projects with positive NPV while reject ones with negative NPV.

The following contents of this case study are organized as follows: we firstly shows our analysis to current financial situation of *Tottenham Hotspur plc* via using provided balance sheets and income statements. After understanding current situations, we evaluate the worthiness of building a new stadium or signing a new striker in following two sections respectively. Lastly, we check the NPV of taking both two projects. We list our assumptions when evaluating projects at the beginning of each section.

## Current situation of the club

In this section, we analysis current financial situation of the club without carrying out any project. Following are our key statements and assumptions during the evaluation:

1. Cash is not included in the calculation of working capital, because, in accounting, it is usually excluded from working capital. What is more, we assume this part of cash will cover the transfer fee in Question 3 and 4. Hence, the working capital (WC) for year 2007 is (millions of pounds):

$$WC = CurrentAssets - CurrentLiabilities = 48.07 - 26.29 - 64.4 = -42.62$$

2. Starting from the year of 2019, the growth rates of working capital, revenue and payroll are all 4%.

3. As suggested in the provided case study materials, the growth rates of capital expenditure (CAPEX) and corresponding depreciation are both 4%.

As shown in Appendix Question 1, after evaluation the club currently worth **NPV** = £158.32M.

## Building a new stadium only

After understanding current situation of the club, we now consider the project of building a new stadium only. Following are our key statements and assumptions in the evaluating procedure:

1. The £250M is raised in year 2008 and 2009, each corresponds to £125M. The capital is raised from a consortium of wealthy investors. The club needs to repay the loan in 10 years with a 20 years risk free rate  $r = 0.0457$ .
2. The £250M is depreciated linearly in 10 years with 0 salvage value, thus each year we receive £25M depreciation from the new stadium from 2010 to 2019.
3. The maintenance capital expenditure (CAPEX) is fixed regardless of what stadium the club owns.
4. We start our evaluating by firstly updating numbers in **Exhibit 5**, which means that starting from year 2010, the club would have 40% raise in attendance revenue, 20% raise in sponsorship and 14% raise in operating expenses.
5. During evaluating process, we found that in the first couple years, the earning before tax (EBT) of the club are negative, thus we can use the *tax carryforwards* technique introduced in the textbook to avoid being taxed in the first several years.
6. The last important assumption is that we found that the growth rate of overall cash flow between 2020 and 2019 are more than 40%, since we don't need to repay loans anymore. However, as the given long-term growth rate is 4%, we need to calculate the overall cash flow of 2021 in order to obtain the terminal value, as shown in the table of Question 2 in Appendix.

As shown in Appendix Question 2, building a new stadium has **NPV** = £206.08M.

## Signing a new striker only

Except for building a new stadium, the Hotspurs also has another choice, i.e., signing a new striker to enhance their performance in Premiership, which will lead to a motivation in revenue. As for this project, we tried to quantify its impact of the club and evaluate the NPV of it. Following are the key strategy and several crucial assumptions we made in estimation.

1. To sign a new striker, the Hotspurs needs to afford a transfer fee up to £20M, which will be cover by the cash on balance sheet. Meanwhile, the new striker's salary is £50K/week (£2.6M/year) with an annual increase of 10%. In addition, as for the depreciation of the player, it is a complicated problem because the salvage of the player after ten years is involved with a lot of reasons, like health and age. Furthermore, he may also transfer in ten years due to his performance. Therefore, to simplify the situation, we just assumed the player would stay in Tottenham for ten years and resign a new contract with 4% salary increase after this contract, which means that we would not depreciate the player in this evaluation, although we found some football clubs may use this way to deduct the taxable income, like Manchester United.
2. From **Exhibit 2**, we can acquire the relationship between the net goals and points of the club, which will decide the final ranking and revenue of the club. By using a linear regression, we can establish a relation that, when net goal increase 1, the final points will increase 0.666. And when final points increase 1%, the revenue will increase 1.52% However, due to the outdated stadium, Tottenham can only capture  $1.52\% \times \frac{1}{4} = 0.38\%$  enhanced revenue resulting from the new striker. Furthermore, to simplify the problem, we would not consider the ranking increase which will lead to a £0.76M additional earning each move up individually, and just believed it had already been included in the average revenue increase.
3. As for the new striker, the club expects he can add 12 more net goals for the team per season when he is healthy. Meanwhile, based on the statistics, we could have that at each point of the season, there would be 20% players sidelined by injury of other reasons. Therefore, we would assume that this new player will increase about 9.6

more net goals for Tottenham. Besides, to simplify the problem, we would regard it as an average result, which will overlook the fluctuation of his performance between seasons.

Based on above strategy and assumptions, we could conclude that a new striker will bring  $9.6 \times 0.675 \times 0.38/51 = 4.8\%/season$  more revenue to the club. Therefore, using DCF approach, we can evaluate the NPV of this project. **NPV = £143.31M**

## Building a new stadium and signing a new striker

If Tottenham would consider about signing a new striker and building a new stadium simultaneously, based on the conclusion we made above, we can easily acquire the NPV of this combined decision.

1. After the construction, Tottenham will move to the new stadium and we would not take the time and cost of moving into account.
2. Based on Assumption 1, we would believe that the club will hold the whole additional revenue increase due to the new player's outstanding performance as soon as the stadium is ready

Therefore, we could conclude that the NPV of this project is: **NPV = £376.08M.**

## Appendix

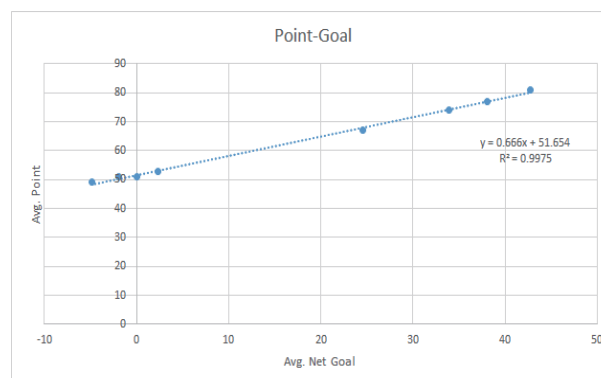


Figure 1: Relation Between Point and Goal

Parameters:	
Unit: millions of pounds	
Discount rate =	0.1025
Tax Rate =	0.35
Annual growth rate of revenue =	0.09
Working capital (2007) =	-42.62
Depreciation growth rate =	0.04
Growth rate maintenance capex =	0.04

## Question 1: Current Situation

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### Updating exhibit 5 when developing stadium

		Current	Forecast												
		0	1	2	3	4	5	6	7	8	9	10	11	12	13
Revenue		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Attendance		17.40	18.97	20.67	31.54	34.38	37.48	40.85	44.53	48.54	52.91	57.67	62.86	68.52	71.26
Sponsorship		15.70	17.11	18.65	24.40	26.59	28.99	31.60	34.44	37.54	40.92	44.60	48.61	52.99	55.12
Broadcast		28.70	31.28	34.10	37.17	40.51	44.16	48.13	52.46	57.19	62.33	67.94	74.06	80.72	83.95
Merchandise		5.20	5.67	6.18	6.73	7.34	8.00	8.72	9.51	10.36	11.29	12.31	13.42	14.63	15.21
Other		7.10	7.74	8.44	9.19	10.02	10.92	11.91	12.98	14.15	15.42	16.81	18.32	19.97	20.77
Total		74.10	80.77	88.04	109.03	118.85	129.55	141.21	153.92	167.77	182.87	199.33	217.27	236.83	246.31
Operating Costs															
Payroll		50.92	56.01	61.62	67.78	74.56	82.01	90.21	99.23	109.16	120.07	132.08	145.29	159.82	166.21
Stadium Operating Expenses		16.38	17.04	17.72	21.01	21.84	22.72	23.63	24.57	25.56	26.57	27.65	28.75	29.89	31.09
Other		1.80	1.87	1.95	2.02	2.11	2.19	2.28	2.37	2.46	2.56	2.66	2.77	2.88	3.00
Total		69.10	74.92	81.29	90.81	98.51	106.92	116.12	126.17	137.18	149.20	162.39	176.81	192.59	200.30
EBITDA															
EBITDA		5.00	5.85	6.75	18.22	20.33	22.63	25.09	27.76	30.60	33.66	36.95	40.46	44.24	46.01
Depreciation New Stadium		0.00	0.00	0.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	0.00
Depreciation Capex		2.20	2.29	2.38	2.47	2.57	2.68	2.78	2.90	3.01	3.13	3.26	3.39	3.52	3.66
EBIT		2.80	3.56	4.37	-9.25	-7.24	-5.05	-2.69	-0.14	2.59	5.53	8.68	12.07	15.72	42.35
Interest															
Interest		2.26	2.46	2.69	2.93	3.19	3.48	3.79	4.13	4.50	4.91	5.35	5.83	6.36	6.61
EBT		0.54	1.10	1.68	-12.18	-10.43	-8.53	-6.48	-4.27	-1.91	0.62	3.33	6.24	9.36	35.74
Tax Carryforwards															
Tax Carryforwards		0.00	0.00	0.00	0.00	-12.18	-22.61	-31.14	-37.62	-41.90	-43.81	-43.19	-39.85	-33.61	-24.25
EBT+TaxCarryforwards		0.54	1.10	1.68	-12.18	-22.61	-31.14	-37.62	-41.90	-43.81	-43.19	-39.85	-33.61	-24.25	11.48
Taxes		0.19	0.38	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50
Net Income															
Net Income		0.35	0.72	1.09	-12.18	-10.43	-8.53	-6.48	-4.27	-1.91	0.62	3.33	6.24	9.36	32.24

### Parameters:

Unit: millions of pounds

Discount rate = 0.1025

Tax Rate = 0.35

Annual growth rate of revenue = 0.09

Working capital (2007) = -42.62

Depreciation growth rate = 0.04

Growth rate maintenance capex = 0.04

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Question 2: Building a new stadium only

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Variables			
Revenue growth	9.00%	Depreciation Stadium	25.00
discount rate	10.25%	Payment Int+Prem (Million)	-£15.85
Long term growth rate	4.00%	Transfer Fee	20.00
Tax	35.00%	Num of Goals (Expected)	12.00
Depreciation growth	4.00%	Avg Num of Goals (Actually)	9.60
Capex	-3.30	Salary / Week (Million)	0.05
Capex growth	4.00%	Salary / Year (Million)	2.60
Increase sponsorship	0.20	Increase in Players Salary	10.00%
increase attendance	0.40	Num Years of Contract	10.00
increase merchandising	0.05	Increase in Points	6.39
Extra Sponsorship (name)	10.00	Old Average	51.00
tax	0.35	Increase in Points	12.54%
increase in player payroll	1.10	Increase per 1%	1.52%
Increase stadium operating cost	1.14	Increase per 1% if No Stadium	0.38%
Loan (Million)	250.00	Increase Revenue with Stadium	19.06%
risk free rate	4.57%	Increase Revenue without Stadium	4.76%
Cost Stadium	250.00		

Time Line	0	1	2	3	4	5	6	7	8	9	10	11	12	13		
Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Income Statement																
Attendance		17.40		18.97	20.67	22.53	24.56	26.77	29.18	31.81	34.67	37.79	41.19	44.90	48.94	50.90
Sponsorship		15.70		17.11	18.65	20.33	22.16	24.16	26.33	28.70	31.28	34.10	37.17	40.51	44.16	45.93
Broadcasting		28.70		31.28	34.10	37.17	40.51	44.16	48.13	52.46	57.19	62.33	67.94	74.06	80.72	83.95
Merchandise		5.20		5.67	6.18	6.73	7.34	8.00	8.72	9.51	10.36	11.29	12.31	13.42	14.63	15.21
Others		7.10		7.74	8.44	9.19	10.02	10.92	11.91	12.98	14.15	15.42	16.81	18.32	19.97	20.77
Total		74.10		84.62	92.23	100.53	109.58	119.45	130.19	141.91	154.68	168.60	183.78	200.32	218.35	227.09
Operating costs																
Payroll		50.92		56.01	61.61	67.77	74.55	82.01	90.21	99.23	109.15	120.07	132.07	145.28	159.81	175.79
Salary for New Player				2.60	2.86	3.15	3.46	3.81	4.19	4.61	5.07	5.57	6.13	6.74	7.42	7.71
Total Salaries		50.92		58.61	64.47	70.92	78.01	85.81	94.40	103.83	114.22	125.64	138.20	152.02	167.23	183.50
Stadium Operating Cost		16.38		17.04	17.72	18.43	19.16	19.93	20.73	21.55	22.42	23.31	24.25	25.22	26.22	27.27
Other		1.80		1.87	1.95	2.02	2.11	2.19	2.28	2.37	2.46	2.56	2.66	2.77	2.88	3.00
Total		69.10		77.52	84.14	91.37	99.28	107.93	117.41	127.75	139.10	151.51	165.11	180.01	196.33	213.77
EBITDA		5.00		7.10	8.08	9.16	10.30	11.51	12.79	14.16	15.58	17.09	18.66	20.30	22.02	13.31
Depreciation of CAPEX		2.20		2.29	2.38	2.47	2.57	2.68	2.78	2.90	3.01	3.13	3.26	3.39	3.52	3.66
EBIT		2.80		4.81	5.70	6.68	7.72	8.83	10.00	11.26	12.57	13.96	15.41	16.92	18.50	9.65
Interest		2.26		2.46	2.69	2.93	3.19	3.48	3.79	4.13	4.50	4.91	5.35	5.83	6.36	6.61
EBT		0.54		2.35	3.01	3.75	4.53	5.35	6.21	7.13	8.07	9.05	10.06	11.09	12.14	3.04
Tax carry forward		-		-	-	-	-	-	-	-	-	-	-	-	-	-
EBT + Carry Forward		0.54		2.35	3.01	3.75	4.53	5.35	6.21	7.13	8.07	9.05	10.06	11.09	12.14	3.04
TAX		0.19		0.82	1.05	1.31	1.59	1.87	2.17	2.50	2.82	3.17	3.52	3.88	4.25	1.06
Net income		0.35		1.53	1.96	2.44	2.95	3.48	4.04	4.64	5.25	5.88	6.54	7.21	7.89	1.98
Year	2006	0 2007	1 2008	2 2009	3 2010	4 2011	5 2012	6 2013	7 2014	8 2015	9 2016	10 2017	11 2018	12 2019	13 2020	
Net Income		0.35		1.53	1.96	2.44	2.95	3.48	4.04	4.64	5.25	5.88	6.54	7.21	7.89	1.98
Depreciation of CAPEX		2.20		2.29	2.38	2.47	2.57	2.68	2.78	2.90	3.01	3.13	3.26	3.39	3.52	3.66
Working Capital	-39.10	-42.62		-46.46	-50.64	-55.19	-60.16	-65.58	-71.48	-84.92	-92.57	-100.90	-109.98	-119.88	-124.67	
Changes in WC		3.52		3.84	4.18	4.56	4.97	5.41	5.90	6.43	7.01	7.64	8.33	9.08	9.90	4.80
Cash Flow of Daily Operating		6.07		7.65	8.52	9.47	10.49	11.57	12.72	13.96	15.27	16.66	18.13	19.67	21.31	10.43
CAPEX		-3.30		-3.43	-3.57	-3.71	-3.86	-4.01	-4.18	-4.34	-4.52	-4.70	-4.88	-5.08	-5.28	-5.49
Cash Flow of Investing		-3.30		-3.43	-3.57	-3.71	-3.86	-4.01	-4.18	-4.34	-4.52	-4.70	-4.88	-5.08	-5.28	-5.49
Interest		2.26		2.46	2.69	2.93	3.19	3.48	3.79	4.13	4.50	4.91	5.35	5.83	6.36	6.61
Cash Flow of Banking		2.26		2.46	2.69	2.93	3.19	3.48	3.79	4.13	4.50	4.91	5.35	5.83	6.36	6.61
Total Cash Flow		5.03		6.68	7.64	8.69	9.82	11.04	12.34	13.75	15.25	16.87	18.59	20.42	22.39	11.55
Discounted CF		5.03		6.06	6.29	6.48	6.64	6.78	6.87	6.95	6.99	7.01	7.01	6.98	64.23	
NPV		143.31														



Revenue growth	0.09	Payment Int+Prem	-31.70
Discount rate	0.10	Payment Half Loan	-15.85
Long term growth rate	0.04	Length Loan	10.00
Tax	0.35	Cost of Player	20.00
Depreciation growth	0.04	Num of Goals (Expected)	12.00
Capex	-3.30	Avg Num of Goals (Actually)	9.60
Capex growth	0.04	Salary / Week (Million)	0.05
Increase sponsorship	0.20	Salary / Year (Million)	2.60
Increase attendance	0.40	Increase in Players Salary	0.10
Increase merchandising	0.05	Num Years of Contract	10.00
Extra Sponsorship (name)	5.00	Increase in Points	6.39
Tax	0.35	Old Average	51.00
Increase in player payroll	1.10	Increase in Points	12.54%
Increase stadium operating cost	1.14	Increase per 1% with Stadiu	1.52%
Loan	250.00	Increase per 1% without St	0.38%
Risk free rate	0.05	Increase Revenue with Stad	19.06%
Cost Stadium (Million)	250.00	Increase Revenue without S	4.76%
Depreciation Stadium (Million)	25.00		

## Q4. A new stadium and a new player

			Current	Forecast												
			0	1	2	3	4	5	6	7	8	9	10	11	12	13
Revenue			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	Attendance		17.40	18.97	20.67	31.54	34.38	37.48	40.85	44.53	48.54	52.91	57.67	62.86	68.52	71.26
	Sponsorship		15.70	17.11	18.65	24.40	26.59	28.99	31.60	34.44	37.54	40.92	44.60	48.61	52.99	55.12
	Broadcast		28.70	31.28	34.10	37.17	40.51	44.16	48.13	52.46	57.19	62.33	67.94	74.06	80.72	83.95
	Merchandise		5.20	5.67	6.18	6.73	7.34	8.00	8.72	9.51	10.36	11.29	12.31	13.42	14.63	15.21
	Other		7.10	7.74	8.44	9.19	10.02	10.92	11.91	12.98	14.15	15.42	16.81	18.32	19.97	20.77
	Total		74.10	84.62	92.23	129.80	141.49	154.24	168.12	183.25	199.74	217.71	237.31	258.67	281.96	293.24
Operating Costs																
	Payroll		50.92	56.01	61.62	67.78	74.56	82.01	90.21	99.23	109.16	120.07	132.08	145.29	159.82	166.21
	Salary for New Player			2.60	2.86	3.15	3.46	3.81	4.19	4.61	5.07	5.57	6.13	6.74	7.42	8.16
	Total Salary		50.92	58.61	64.48	70.93	78.02	85.82	94.40	103.84	114.23	125.64	138.21	152.03	167.24	174.37
	Stadium Operating Expenses		16.38	17.04	17.72	21.01	21.84	22.72	23.63	24.57	25.56	26.57	27.65	28.75	29.89	31.09
	Other		1.80	1.87	1.95	2.02	2.11	2.19	2.28	2.37	2.46	2.56	2.66	2.77	2.88	3.00
	Total		69.10	77.52	84.15	93.96	101.97	110.73	120.31	130.77	142.25	154.78	168.52	183.55	200.01	208.46
	EBITDA		5.00	7.10	8.08	35.85	39.52	43.51	47.81	52.48	57.50	62.94	68.80	75.12	81.95	84.78
	Depreciation New Stadium		0.00	0.00	0.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	0.00
	Depreciation Capex		2.20	2.29	2.38	2.47	2.57	2.68	2.78	2.90	3.01	3.13	3.26	3.39	3.52	3.66
	EBIT		2.80	4.81	5.70	8.38	11.95	15.83	20.03	24.58	29.49	34.81	40.54	46.73	53.43	81.12
	Interest		2.26	2.46	2.69	2.93	3.19	3.48	3.79	4.13	4.50	4.91	5.35	5.83	6.36	6.61
	EBT		0.54	2.35	3.01	5.45	8.76	12.35	16.24	20.45	24.99	29.90	35.19	40.90	47.07	74.51
	Tax Carryforwards		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	EBT+TaxCarryforwards		0.54	2.35	3.01	5.45	8.76	12.35	16.24	20.45	24.99	29.90	35.19	40.90	47.07	74.51
	Taxes		0.19	0.82	1.05	1.91	3.07	4.32	5.68	7.16	8.75	10.46	12.32	14.31	16.47	26.08
	Net Income		0.35	1.53	1.96	3.54	5.69	8.03	10.55	13.29	16.24	19.43	22.87	26.58	30.59	48.43
Year		2006	0	1	2	3	4	5	6	7	8	9	10	11	12	13
	Working Capital	-39.10	-42.62	-46.46	-50.64	-55.19	-60.16	-65.58	-71.48	-77.91	-84.92	-92.57	-100.90	-109.98	-119.88	-124.67
	Changes in WC		3.52	3.84	4.18	4.56	4.97	5.41	5.90	6.43	7.01	7.64	8.33	9.08	9.90	4.80
	Building New Stadium			-125.00	-125.00											
	Raised Money			125.00	125.00											
	Loan for first year				-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	0.00
	Loan for second year				0.00	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	-15.85	
	CAPEX		-3.30	-3.43	-3.57	-3.71	-3.86	-4.01	-4.18	-4.34	-4.52	-4.70	-4.88	-5.08	-5.28	-5.49
	Depreciation Capex		2.20	2.29	2.38	2.47	2.57	2.68	2.78	2.90	3.01	3.13	3.26	3.39	3.52	3.66
	Depreciation New Stadium		0.00	0.00	0.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	0.00
	Interest		2.26	2.46	2.69	2.93	3.19	3.48	3.79	4.13	4.50	4.91	5.35	5.83	6.36	6.61
	Net Income		0.35	1.53	1.96	3.54	5.69	8.03	10.55	13.29	16.24	19.43	22.87	26.58	30.59	48.43
	Overall Cash Flow		5.03	6.68	-8.21	3.08	5.86	8.88	12.15	15.71	19.54	23.71	28.22	33.10	54.24	58.00
	Terminal Value															965.15
	DCF		5.03	6.06	-6.76	2.30	3.96	5.45	6.76	7.93	8.95	9.85	10.64	11.32	16.82	287.75
	NPV		376.08													

60.32