

Is European benchmarking methodology favouring a narrow segment of air navigation service providers?

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ABSTRACT

Keywords:

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This paper looks at the calculation of composite flight hours used input to performance benchmarking of European air navigation service providers. The way the en-route part of the composite flight hours is obtained, potentially rewards busy air navigation service providers serving larger airports with additional composite flight hours, thus making them more productive and financially cost-efficient. We also examine the financial effect of the methodology and link it to economic cost-effectiveness.

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1. Introduction

European air traffic management (ATM) has emerged as relatively inefficient and costly compared to other similar systems in the world (Eurocontrol, 2012a). In 1998 The European Organisation for the Safety of Air Navigation (EUROCONTROL), established the Performance Review Commission (PRC), supported by the Performance Review Unit (PRU), to facilitate more efficient management of the European ATM and to introduce strong, transparent and independent performance review and target setting.

In December 2010, the European Commission adopted a decision establishing EU-wide performance targets for the provision of air navigation services for 2012 to 2014. PRU ATM cost-effectiveness (ACE) benchmarking, is seen as one of the main inputs for determining the EU-wide cost-efficiency target to play a major role in the assessment of national/functional airspace blocks performance plans (Eurocontrol, 2011, 2012b). In turn, it will be used by the European Commission to set the first priorities for Member States to revise their individual performance plans. For benchmarking purposes PRU established the following key performance indicators (KPIs):

- (a) Financial cost-effectiveness – European air traffic management/communication, navigation, surveillance (ATM/CNS) provision costs per composite flight hour with the sub-set of KPIs:
 - Air traffic control officer (ATCO) hour productivity – efficiency with which an ANSP utilizes the ATCO manpower;
 - ATCO employment costs per ATCO hour;

- ATCO employment costs per composite flight hour;
 - Support costs per composite flight hour;
- (b) Forward looking Cost-Effectiveness – forward looking plans and projections for five years;
 - (c) Economic cost-effectiveness, taking into account both financial cost-effectiveness and quality of service (air traffic flow management ground delays, airborne holding, horizontal flight-efficiency and the resulting route length extension, vertical flight-efficiency and the resulting deviation from optimal vertical flight profile).

As composite flight hours (CFH) are common used as denominators for benchmarking the financial cost-effectiveness, ATCO hour productivity, ATCO employment costs per CFH and support costs per composite flight hour, they can have a significant impact on results of any benchmarking exercise.

2. Composite flight hours

CFH in Equation (1) is the summation of the en-route flight hours (EFH) and instrument flight rules (IFR) airport movements (IAM) weighted by a factor that reflected the relative (monetary) importance of terminal and en-route costs in the cost base (Eurocontrol, 2012b).

$$CFH = EFH + 0.26IAM \quad (1)$$

Data on CFH, EFH, IAM and number of over flights (N_{ovf}) are available in all ACE Reports, whereas data on average transit time (\bar{t}_{ovf}) are only available in ACE Reports until 2009 (Table 1). Since the Report for 2010 does not provide full information on capacity and productivity indicators at area control centre level (in particular, the important, average transit time, \bar{t}_{ovf}), the impact of CFH on

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Table 1
Data for calculations of \bar{t}_{ovf} , EFH and CFH.

| ANSP name | CFH [h] | IAM [/] | Novf [/] | \bar{t}_{ovf} [min] | AH [h] | C [€1000] | EFH | CFH _R | EFH _R | \bar{t}_{ovfR} | $N_{ovf} \bar{t}_{ovfR} / 60$ |
|------------------|------------|------------|-------------|--------------------------|-----------|--------------|---|--------------------------------------|--|---|-------------------------------|
| | | | | | | | $\frac{N_{ovf} \bar{t}_{ovf}}{60}$ [h] | EFH _{R} - 0.26 IAM [h]} | $\frac{N_{ovf} \bar{t}_{ovfR}}{60}$ [h] | $\frac{60 \text{ EFH}}{N_{ovf}}$ [min] | |
| DSNA | 2,608,943 | 1,825,955 | 2,700,262 | 24.08 | 3,491,423 | 1,157,658 | 2,128,651 | 1,558,453 | 1,083,705 | 47.30 | 1.96 |
| NATS | 1,780,323 | 1,788,687 | 2,230,255 | 18.32 | 1,761,911 | 686,714 | 1,309,834 | 1,146,030 | 680,971 | 35.24 | 1.92 |
| UkSATSE | 350,897 | 164,641 | 377,616 | 26.25 | 1,152,216 | 137,114 | 307,591 | 208,014 | 165,207 | 48.87 | 1.86 |
| Avinor | 461,124 | 601,428 | 527,555 | 19.46 | 593,808 | 158,022 | 302,927 | 327,475 | 171,104 | 34.45 | 1.77 |
| DFS | 1,860,706 | 2,005,398 | 2,727,654 | 17.64 | 1,943,240 | 887,594 | 1,333,214 | 1,323,334 | 801,930 | 29.33 | 1.66 |
| LVNL | 261,508 | 452,659 | 529,600 | 10.00 | 288,156 | 178,864 | 142,442 | 205,958 | 88,267 | 16.14 | 1.61 |
| LFV | 533,250 | 507,838 | 650,664 | 23.27 | 814,920 | 166,213 | 399,670 | 384,387 | 252,349 | 36.85 | 1.58 |
| ENAV | 1,332,441 | 1,128,421 | 1,532,885 | 25.60 | 1,783,287 | 648,610 | 1,035,626 | 947,420 | 654,031 | 40.54 | 1.58 |
| Aena | 1,751,600 | 1,830,254 | 1,681,639 | 28.66 | 3,374,412 | 1,187,505 | 1,270,178 | 1,279,129 | 803,263 | 45.32 | 1.58 |
| Skyguide | 446,306 | 451,172 | 1,154,649 | 11.47 | 414,866 | 217,815 | 327,631 | 338,035 | 220,730 | 17.02 | 1.48 |
| Belgo-control | 203,500 | 350,081 | 542,404 | 9.00 | 300,804 | 150,222 | 111,416 | 172,382 | 81,361 | 12.32 | 1.37 |
| DHMÍ | 896,279 | 682,590 | 828,059 | 38.05 | 1,432,518 | 242,508 | 716,733 | 702,601 | 525,127 | 51.93 | 1.36 |
| Finavia | 175,159 | 253,615 | 230,097 | 22.21 | 287,052 | 57,118 | 108,449 | 151,114 | 85,174 | 28.28 | 1.27 |
| NAV Portugal | 326,994 | 258,820 | 402,052 | 31.00 | 356,202 | 134,269 | 258,915 | 275,020 | 207,727 | 38.64 | 1.25 |
| ARMATS | 16,326 | 18,698 | 48,120 | 12.00 | 140,460 | 6284 | 11,408 | 14,485 | 9624 | 14.22 | 1.19 |
| PANSA | 399,485 | 283,303 | 552,173 | 30.00 | 456,766 | 117,984 | 324,966 | 349,745 | 276,087 | 35.31 | 1.18 |
| MATS | 49,004 | 29,115 | 85,294 | 25.00 | 103,663 | 13,499 | 41,346 | 43,109 | 35,539 | 29.08 | 1.16 |
| ANS CR | 266,155 | 180,152 | 629,249 | 18.00 | 284,748 | 107,636 | 218,769 | 235,614 | 188,775 | 20.86 | 1.16 |
| Austro Control | 386,571 | 369,881 | 888,732 | 17.00 | 408,592 | 165,934 | 289,279 | 347,976 | 251,807 | 19.53 | 1.15 |
| HCAA | 525,775 | 205,566 | 637,923 | 39.00 | 779,100 | 178,065 | 471,704 | 468,097 | 414,650 | 44.37 | 1.14 |
| M-NAV | 24,362 | 12,441 | 125,148 | 9.00 | 98,088 | 10,722 | 21,090 | 22,007 | 18,772 | 10.11 | 1.12 |
| MoldATSA | 14,680 | 12,184 | 43,778 | 14.00 | 82,734 | 6630 | 11,475 | 13,383 | 10,215 | 15.73 | 1.12 |
| NAVIAIR | 283,701 | 328,788 | 587,298 | 18.00 | 303,519 | 112,009 | 197,218 | 261,674 | 176,189 | 20.15 | 1.12 |
| Oro Navigacija | 51,375 | 31,642 | 157,404 | 15.00 | 125,208 | 18,704 | 43,052 | 47,578 | 39,351 | 16.41 | 1.09 |
| ROMATSA | 307,889 | 167,860 | 433,848 | 34.00 | 716,758 | 147,767 | 263,736 | 289,491 | 245,847 | 36.47 | 1.07 |
| Hungaro Control | 223,735 | 109,203 | 607,452 | 18.00 | 265,716 | 74,035 | 195,011 | 210,628 | 182,236 | 19.26 | 1.07 |
| LGS | 76,768 | 59,858 | 204,012 | 17.00 | 123,073 | 20,134 | 61,023 | 73,366 | 57,803 | 17.95 | 1.06 |
| Slovenia Control | 51,524 | 40,235 | 233,298 | 10.00 | 129,794 | 24,224 | 40,941 | 49,344 | 38,883 | 10.53 | 1.05 |
| DCAC Cyprus | 137,863 | 62,146 | 267,591 | 26.00 | 181,384 | 40,717 | 121,516 | 132,114 | 115,956 | 27.25 | 1.05 |
| EANS | 60,218 | 29,074 | 150,624 | 20.00 | 62,160 | 9826 | 52,570 | 57,767 | 50,208 | 20.94 | 1.05 |
| Croatia Control | 191,291 | 86,246 | 420,613 | 23.00 | 304,169 | 64,323 | 168,605 | 183,659 | 161,235 | 24.05 | 1.05 |
| LPS | 86,442 | 40,382 | 336,097 | 13.00 | 148,217 | 46,367 | 75,820 | 83,320 | 72,821 | 13.54 | 1.04 |
| SMATSA | 224,356 | 62,942 | 505,889 | 24.00 | 301,184 | 69,502 | 207,800 | 218,721 | 202,356 | 24.65 | 1.03 |
| MUAC | 531,873 | 0 | 1,484,804 | 21.00 | 291,265 | 134,603 | 531,873 | 519,681 | 519,681 | 21.49 | 1.02 |
| IAA | 317,166 | 233,641 | 525,810 | 29.12 | 364,632 | 106,922 | 255,710 | 315,940 | 255,193 | 29.18 | 1.00 |
| BULATSA | 185,907 | 93,814 | 485,313 | 20.00 | 285,039 | 76,951 | 161,231 | 186,163 | 161,771 | 19.93 | 1.00 |
| NATA Albania | 40,038 | 20,583 | 161,444 | 13.00 | 69,919 | 16,462 | 34,624 | 40,331 | 34,980 | 12.87 | 0.99 |

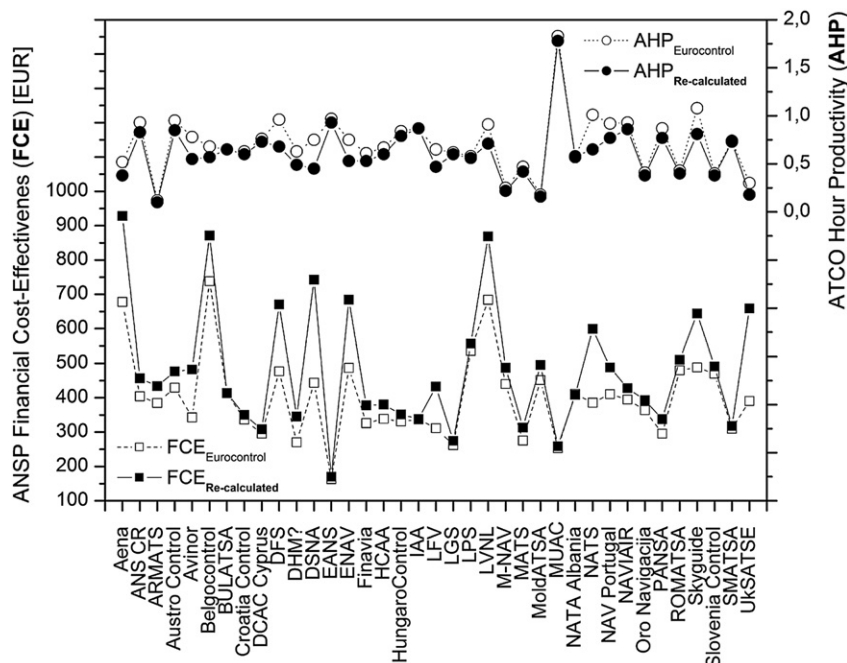


Fig. 1. Comparison of FCE and AHP – EUROCONTROL reported and recalculated.

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