Decomposition example using typesetters data

original formula (using male e.g. as standard)

$$(w_m - w_f) = [(a_m - a_f) + \Sigma X_f (b_m - b_f)] + \Sigma b_m (X_m - X_f)$$

expand for typesetter data:

b's for age; b's for M2; etc. →

$$\begin{aligned}(w_m - w_f) = [&(a_m - a_f) + \bar{A}_f (b_m - b_f) + \bar{M2}_f (b_m - b_f) + \bar{M3}_f (b_m - b_f) \\ &+ \bar{R2}_f (b_m - b_f) + \bar{R3}_f (b_m - b_f) + \bar{R4}_f (b_m - b_f) + \bar{E1}_f (b_m - b_f) \\ &+ \bar{E3}_f (b_m - b_f) + \bar{H}_f (b_m - b_f) + \bar{C2}_f (b_m - b_f) + \bar{C3}_f (b_m - b_f) \\ &+ \bar{C4}_f (b_m - b_f) + \bar{T2}_f (b_m - b_f) + \bar{T3}_f (b_m - b_f)] \\ &+ b_m (\bar{A}_m - \bar{A}_f) + b_m (\bar{M2}_m - \bar{M2}_f) + b_m (\bar{M3}_m - \bar{M3}_f)\end{aligned}$$

↳ δ b for age; ↳ δ b for M2; ↳ δ b for M3; etc. →

$$\begin{aligned}&+ b_m (\bar{R2}_m - \bar{R2}_f) + b_m (\bar{R3}_m - \bar{R3}_f) + b_m (\bar{R4}_m - \bar{R4}_f) \\ &+ b_m (\bar{E1}_m - \bar{E1}_f) + b_m (\bar{E3}_m - \bar{E3}_f) + b_m (\bar{H}_m - \bar{H}_f) \\ &+ b_m (\bar{C2}_m - \bar{C2}_f) + b_m (\bar{C3}_m - \bar{C3}_f) + b_m (\bar{C4}_m - \bar{C4}_f) \\ &+ b_m (\bar{T2}_m - \bar{T2}_f) + b_m (\bar{T3}_m - \bar{T3}_f)\end{aligned}$$

substitute from output [example rounds to 3 dec. places]

$$\begin{aligned}(w_m - w_f) = [&(5402.768 - (-2510.746)) + 32.611^{\bar{A}_f}(32.323 - 61.051) + .167^{\bar{M2}_f}(-1703.092 - 345.499) \\ &+ .281^{\bar{M3}_f}(-4372.905 + 108.294) + .302^{\bar{R2}_f}(48.080 + 215.105) + .278^{\bar{R3}_f}(-1942.579 + 726.233) \\ &+ .195^{\bar{R4}_f}(-1678.019 - 405.846) + .086^{\bar{E1}_f}(-1052.219 + 218.755) + .334^{\bar{E3}_f}(-300.709 - 34.647) \\ &+ 1650.591^{\bar{H}_f}(5.653 - 4.848) + .039^{\bar{C2}_f}(4245.486 - 1316.083) + .039^{\bar{C3}_f}(-517.735 + 4.070) \\ &+ .006^{\bar{C4}_f}(-9692.955 + 10719) + .483^{\bar{T2}_f}(485.776 - 1131.217) + .179^{\bar{T3}_f}(-612.644 - 931.868)] \\ &+ 32.323(42.212^{\bar{A}} - 32.611) + (-1703.092)(.093^{\bar{M2}} - .167) + (-4372.905)(.204^{\bar{M3}} - .281) \\ &+ 48.080(.285^{\bar{R2}} - .302) + (-1942.579)(.191^{\bar{R3}} - .278) + (-1678.019)(.172^{\bar{R4}} - .195) \\ &+ (-1052.219)(.163^{\bar{E1}} - .086) + (-300.709)(.280^{\bar{E3}} - .334) + 5.653(1881.235^{\bar{H}} - 1650.591) \\ &+ (4245.486)(.035^{\bar{C2}} - .039) + (-517.735)(.055^{\bar{C3}} - .039) + (-9692.955)(.002^{\bar{C4}} - .006) \\ &+ (485.776)(.632^{\bar{T2}} - .483) + (-612.644)(.103^{\bar{T3}} - .179)\end{aligned}$$

expanding:

$$(W_m - W_f) = \underbrace{\left[(7913.514)\right]}_{\text{diffs in intercepts}} + \underbrace{\left[(-936.849)^{A} + (-342.101)^{M2} + (-1198.356)^{M3} + (79.482)^{R2} + (-338.144)^{R3} + (-406.354)^{R4} + (-71.678)^{E1} + (-112.009)^{E3} + (1328.661)^{H} + (114.247)^{C2} + (-20.033)^{C3} + (6.156)^{C4} + (-311.748)^{T2} + (-276.468)\right]}_{\text{diffs in slopes}} + \underbrace{\left[(310.333)^{A} + (126.029)^{M2} + (336.714)^{M3} + (-.817)^{R2} + (12.404)^{R3} + (38.594)^{R4} + (-81.021)^{E1} + (16.238)^{E3} + (1303.831)^{H} + (-16.982)^{C2} + (-8.284)^{C3} + (3.852)^{C4} + (72.381)^{T2} + (46.561)^{T3}\right]}_{\text{diffs in X's}}$$

$$(15789.248 - 8014.109) = \underbrace{7,913.514}_{=\text{diffs in intercepts}} + \underbrace{(-2485.194)}_{=\text{diffs in slopes}} + \underbrace{(2159.833)}_{=\text{explained by diffs in X's}}$$

$$7775.139$$

$$5428.32 + 2159.833$$

(unexplained) (explained)

$$7775.139 \cong 7588.153$$ (prob OK w/in rounding error)

Worksheet for making final table

	Earnings diff due to sex diffs in:	% of earnings gap due to:
Age	310.333	4.1%
Marital status	462.743	6.1
Region	50.181	.7
Education	−64.783	−.9
Hours worked per year	1303.831	17.2
Class	−21.414	−.3
Industry	118.942	1.6
Sex diffs in intercepts + slopes	5428.32	71.5
Total gap (σ − ♀)	7588.153	(if don't round, should = 7775.139)

Male average ($\bar{X}$) earnings = 15789.248
Female average ($\bar{X}$) earnings = 8014.109

To calculate ♂ earnings if they had ♀'s background characteristics, but their own rate of return ($W_{f,m}$ in Golden's terminology) [or ♀'s earnings if they had their own background chars, but were paid as ♂]

$\bar{X}$ earnings for ♂ − amt of sex diff explained by diff in $\bar{X}$'s [$W_m - W_{f,m}$]

= 15789.248 − 2159.833

= 13,629.415

- expressed as % of what ♂ do earn: 13629.415 / 15789.248 = 86.3%

Interpretation: ♂ would earn 86.3% as much as they currently earn if they had ♀'s background characteristics but their own rate of return [or, ♀ would earn 86.3% as much as ♂ if they had their own characteristics, but were paid as ♂]