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Earnouts: Negotiating Acquisitions Where the Payment Is Contingent on Post-Acquisition Performance

Yigal Gerchak, Avraham Sless

School of Industrial and Intelligent Systems Engineering, Tel Aviv University, Tel Aviv, Israel
Email: yigal@tauex.tau.ac.il

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Abstract

The study builds an analytical framework for structuring earnout deals for acquisitions that trade a lower upfront payment for future payments tied to the target's post-deal performance (typically a percentage of revenue/turnover, sometimes with minimum and/or maximum transfer amounts). The study aims to supplement predominantly simulation-based prior work with tractable formulas. Using an asymmetric Nash bargaining solution, we derive closed-form conditions for the optimal upfront payment and the revenue-sharing rate when buyer and seller hold different beliefs about future turnover. We work through cases where either the buyer or the seller retains operating control, and then extend the model to include lower (floor) and upper (cap) bounds on total transfers, treating turnover as stochastic and illustrating with exponential distributions. The paper shows how these contractual levers shape percentage, upfront payment, and any floors/caps-shift with the parties' optimism or pessimism and with the tightness of the bounds. It closes by outlining extensions (joint floors and caps, negotiated bounds, risk aversion, and misreporting incentives under information asymmetry).

Keywords

Acquisition, Earnouts, Performance, Nash Bargaining Solution, Negotiations, Game Theory

1. Introduction

The acquisition of a firm by another may involve performance-based periodic payments and a reduced downpayment. A case in point is the recent acquisition and assumption of control of a bakery chain by another (Georgy, 2024). The contract stipulated that the buyer would pay the seller 5% of turnover for 6 years with a specific minimum in the first 4 years, in return for a reduced downpayment. This can be viewed as a loan to the buyer from the seller, where loan repayments are based on the buyer's performance and constitute a percentage of turnover (rather than of profit). If the seller retains control, its performance then determines the transfers.

Such contracts are referred to as "earnouts" or "contingent value rights". The academic literature concerning earnouts (Chatterjee and Yan, 2008; Kohers and Ang, 2000; Lukas et al., 2012; Quinn, 2013; Dahlen, 2024), and relevant business outlets and consulting manuals (e.g., Grant Thornton, 2019; Broughton, 2024; Wilson and Biemans, 2018), report on various implementations of such schemes. Often, earnout contracts also stipulate a minimum and/or maximum transfer.

Lukas et al. (2012) report that between the year 2000 and 2012, 7000 acquisitions, or roughly 1.5% of all reported acquisitions, were earnout deals. This proportion has increased in recent years (Dahlen, 2024). Earnout payments represented on average 33% of total transaction value. The average earnout period was 2.57 years, but the range was from 1 month to 20 years.

An earnout is a tool commonly used in private mergers and acquisitions, intended mainly to bridge the valuation gap between buyers and sellers, as well as to mitigating adverse selection. The Grant Thornton (2019: p. 22) website lists a variety of performance measures that can be used for earnouts. Among them are turnover/revenue, gross profit percentage and sales volume. As our motivating case (and many others) used only turnover as a contracted-on performance measure, so do we. Additionally, earnout analyses are typically performed by simulation (Wilson and Biemans, 2018) or by scenario analysis.

We intend to investigate such contracts analytically. Note that if the total period in which payments are to be made is fixed (perhaps by law or custom), one can view it as a single period, which is the approach in the current study.

Initially we consider a contract with two parameters: the downpayment A and the share θ of the turnover value that the buyer needs to transfer to the seller. In this initial case there is no bound on the absolute turnover value to be transferred. We propose to model the outcome of the bargaining for A and θ according to that of an asymmetric Nash bargaining (NBS, Nash, 1953).

The parties' expectations about future turnover, following acquisition, are allowed to be different, where the buyer is naturally more optimistic concerning the turnover that will be generated. If the acquisition does not take place, and the firm remains under the seller's ownership and control, the seller's disagreement value is their anticipated (expected) turnover. We provide comparative statics of A^*, θ^* with respect to the parties' expectations.

Subsequently we consider a contract where an exogeneous minimum is set on the buyer's absolute transfer to the seller. Some earnout contracts set an upper bound on a transfer (in addition to a possible lower bound). We investigate such a model as well. When such bounds are present, turnover needs to be modeled as explicitly stochastic.

We exemplify the consequences of contracts assuming parties' expectations are distributed exponentially with unequal means.

2. Basic Model

The parties negotiate a downpayment A and a share θ of turnover value the buyer (b) should transfer to the seller (s). $A = 0$ indicates a pure-debt acquisition, while $\theta = 0$ a downpayment-only acquisition.

The negotiations converge to Nash's bargaining solution if Nash's (mild) axioms are satisfied. Therefore, there is no need for modelling the process of alternating offers. A different set of axioms causes the negotiations to converge to the Raiffa-Kalai-Smorodinsky solution. That is the point closest to the ideal point among all feasible points that lie on the line which connects the ideal point and the disagreement point. In our problem, that would result in extreme solutions (either $A = 0$ or $\theta = 0$), both of which are not interesting.

2.1. Buyer Assumes Control

It is assumed that both parties believe that with no acquisition s's expected turnover will be v_s. With an acquisition, the buyer believes its expected turnover to be v_b, while s believes it will be v_{bs}. One may reasonably assume that

$$v_b \ge v_{bs} \ge v_s > 1.$$

In cases presented later, these forecasts are random.

Thus s expects its profit to be $A + \theta v_{bs} - v_s$, with a disagreement value of v_s, θv_{bs} being s's expected total portion of the turnover. b predicts that its profit will be $v_b - A - \theta v_b$.

The asymmetric Nash's product thus equals

$$NP = \left(A + \theta v_{bs} - 2v_s\right)^{\lambda}\left(v_b - A - \theta v_b\right)^{1-\lambda}, 0 \le \lambda \le 1, A \ge 0, 0 \le \theta \le 1.$$

The parameter λ reflects the relative power of the seller that may depend on who approached whom with the purchase idea. The disagreement value of b is assumed to be zero, as it is assumed to be a large firm for whom the transaction is not essential. s, on the other hand, will lose the sale and be left with its valuation of the business.

It then follows that,

$$\begin{aligned}\frac{\mathrm{d}(NP)}{\mathrm{d}A} &= \left(A + \theta v_{bs} - 2v_s\right)^{\lambda-1}\left(v_b - A - \theta v_b\right)^{-\lambda} \\ &\quad \cdot\left[\lambda\left(v_b - A - \theta v_b\right) - (1-\lambda)\left(A + \theta v_{bs} - 2v_s\right)\right] \\ &= 0;\end{aligned}$$

$$\begin{aligned}\frac{\mathrm{d}(NP)}{\mathrm{d}\theta} &= \left(A + \theta v_{bs} - 2v_s\right)^{\lambda-1}\left(v_b - A - \theta v_b\right)^{-\lambda} \\ &\quad \cdot\left[\lambda v_{bs}\left(v_b - A - \theta v_b\right) - (1-\lambda)v_b\left(A + \theta v_{bs} - 2v_s\right)\right] \\ &= 0.\end{aligned}$$

The relevant solution[1] is obtained by setting the values of the [ ] s to 0. Thus $A=\lambda(v_b-2v_s)+2v_s-[\lambda(v_b-v_{bs})+v_{bs}]\theta$, as well as

$$A=\frac{v_b\left[v_{bs}(2\lambda-1)\theta+\lambda(2v_s-v_{bs})-2v_s\right]}{v_b-\lambda(v_b+v_{bs})}.$$

Equating and solving, obtain

$$\theta^*=\frac{\lambda^2(2v_s-v_b)(v_b-v_{bs})+2\lambda(v_bv_{bs}-v_b^2v_s-3v_bv_s-v_{bs}v_s)+2v_b(v_b+2v_s)}{\lambda^2(v_b^2-v_{bs}^2)+\lambda[v_{bs}(1+v_{bs})-v_b(1+v_{bs})]+v_{bs}(v_b-1)}.$$

If $v_b=v_{bs}\equiv v$, then $\theta^*=\dfrac{2v\left[\lambda(v(1-v_s)-4v_s)+v+2v_s\right]}{v(v-1)}$

$$\Rightarrow A^*=\frac{4v^2(1-v_s)\lambda^2+\left[v^2(2v_s+1)+v(1-6v_s)-2v_s\right]\lambda-2v(v-v_s)+2v_s}{(1-2\lambda)(v-1)}.$$

2.2. Seller Retains Control

Let v_s be s's prediction of its future turnover and $\overline{v}$ b's prediction of it. Then

$$s: A-(1-\theta)v_s.$$

$$b: -A+(1-\theta)\overline{v}.$$

$$\Rightarrow \text{asymmetric } NP=(A+\theta v_s-v_s)^\lambda\left[-A+(1-\theta)\overline{v}\right]^{1-\lambda}$$

$$\Rightarrow A^*=\frac{vv_s(\lambda+1)}{(1-\lambda)v+\lambda v_s},\uparrow\lambda,\ \theta^*=\frac{(1-\lambda)(v-v_s)^2-vv_s}{(1-\lambda)(v-v_s)^2vv_s},\uparrow\lambda\ \text{ if }\ \lambda>1.$$

3. Required Minimal Transfer

For concreteness, we now assume that b assumes control.

Suppose now that if the realized value of θv is less than the agreed upon minimum T, the actual transfer is T, and is exogenously dictated. An increase in T reduces θ and increases A. Now assume that $V_b\sim F_b$, $V_{bs}\sim F_{bs}$, $V_s\sim F_s$, where $V_b\underset{st}{\geq}V_{bs}\underset{st}{\geq}V_s$, $1<E(V_b)<T$. In some cases we shall assume that $F_b=F_{bs}$. Thus s's expected profit is

$$A+E\max(\theta V_{bs},T)-2E(V_s),$$

while b's expected profit is

$$-A-E\max(\theta V_b,T)+E(V_b),$$

where

$$E\max(\theta V,T)=TF_V\left(\frac{T}{\theta}\right)+\theta\int_{\frac{T}{\theta}}^{\infty}vf_V(v)\mathrm{d}v.$$

It follows that

[1]Other solutions, obtained by setting each quantity in ( ) to zero, are $A=2v_s-v_{bs}\theta$ and $A=v_b(1-\theta)$ respectively.

$$NP = -A^2 - AE\max(\theta V_{bs}, T) - AE\max(\theta V_b, T) + 2AE(V_s)$$
$$-E\max(\theta V_b, T)E\max(\theta V_{bs}, T) + 2E(V_s)E\max(\theta V_b, T)$$
$$+AE(V_b) + E(V_b)E\max(\theta V_{bs}, T) - 2E(V_b)E(V_s).$$

Let $\int_{\frac{T}{\theta}}^{\infty} v f_b(v)\mathrm{d}v \equiv d_b$ and $\int_{\frac{T}{\theta}}^{\infty} v f_{bs}(v)\mathrm{d}v \equiv d_{bs}$ Then

$$\frac{\mathrm{d}(NP)}{\mathrm{d}A} = -2A + T\left[F_b\left(\frac{T}{\theta}\right) - F_{bs}\left(\frac{T}{\theta}\right)\right] + d_b - d_{bs} + 2E(V_s) + E(V_b) = 0.$$

$$\Rightarrow A = \frac{1}{2}\left\{T\left[F_b\left(\frac{T}{\theta}\right) - F_{bs}\left(\frac{T}{\theta}\right)\right] + d_b - d_{bs} + 2E(V_s) + E(V_b)\right\}$$

$$\frac{\mathrm{d}(NP)}{\mathrm{d}\theta} = -Ad_{bs} - Ad_b - d_b E\max(\theta V_{bs}, T) - d_{bs}E\max(\theta V_b, T)$$
$$+2E(V_s)d_b + E(V_b)d_{bs}$$
$$=0$$

$$\Rightarrow A = \frac{-2\theta d_b d_{bs} - T\left[d_b F_{bs}\left(\frac{T}{\theta}\right) + d_{bs}F_b\left(\frac{T}{\theta}\right)\right] + 2E(V_s)d_b + E(V_b)d_{bs}}{d_b + d_{bs}}.$$

If T is negotiable, then it is also necessary to compute $\frac{\mathrm{d}(NP)}{\mathrm{d}T} = 0 \Rightarrow A = -\frac{1}{2}\left[F\left(\frac{T}{\theta}\right) + 2E(V_s) + E(V)\right]$, and equate it with the other two A equations.

Example

V ~exponential, $(\lambda_b, \lambda_{bs}, \lambda_s) \Rightarrow E(V) = \frac{1}{\lambda_b}, \frac{1}{\lambda_{bs}}, \frac{1}{\lambda_s}$, where $\lambda_b \le \lambda_{bs} \le \lambda_s$

$T > \frac{1}{\lambda_b}$.

Here,

$$E\max(\theta V, T) = T - (2T + \theta\lambda)\mathrm{e}^{-\lambda\cdot\frac{T}{\theta}}.$$

Thus,

$$\frac{\mathrm{d}(NP)}{\mathrm{d}A} = -2A + \left[T - (2T + \theta\lambda_{bs})\mathrm{e}^{-\lambda_{bs}\cdot\frac{T}{\theta}}\right] + \frac{2}{\lambda_s}$$
$$-\left[T - (2T + \theta\lambda_b)\mathrm{e}^{-\lambda_b\cdot\frac{T}{\theta}}\right] + \frac{1}{\lambda_b}$$
$$=0$$

$$\Rightarrow A = \frac{1}{2}\left[\frac{2}{\lambda_s} + \frac{1}{\lambda_b} + (2T + \theta\lambda_b)\mathrm{e}^{-\lambda_b\cdot\frac{T}{\theta}} - (2T + \theta\lambda_{bs})\mathrm{e}^{-\lambda_{bs}\cdot\frac{T}{\theta}}\right].$$

Note that if $\lambda_{bs} = \lambda_b \equiv \lambda$, then $A = \frac{1}{\lambda_s} + \frac{1}{2\lambda}$ (independent of θ and of *T*).

$$\frac{\mathrm{d}(NP)}{\mathrm{d}\theta} = -A\left(T - \lambda_{bs}\mathrm{e}^{-\lambda_{bs}\cdot\frac{T}{\theta}}\right) - \left(T - \lambda_b\mathrm{e}^{-\lambda_b\cdot\frac{T}{\theta}}\right)\left(T - \theta\lambda_{bs}\mathrm{e}^{-\lambda_{bs}\cdot\frac{T}{\theta}}\right)$$
$$+\frac{2}{\lambda_s}\left(T - \lambda_b\mathrm{e}^{-\lambda_b\cdot\frac{T}{\theta}}\right) + \frac{1}{\lambda_b}\left(T - \lambda_{bs}\mathrm{e}^{-\lambda_{bs}\cdot\frac{T}{\theta}}\right)$$
$$= 0.$$

If $\lambda_{bs} = \lambda_b \equiv \lambda$, then

$$A = \frac{-T^2 + \frac{2\lambda\lambda_s T - 2\lambda - \lambda_s}{\lambda_s}\mathrm{e}^{-\lambda\cdot\frac{T}{\theta}} - \lambda^2\mathrm{e}^{-2\lambda\cdot\frac{T}{\theta}} + \frac{T(2\lambda + \lambda_s)}{\lambda\lambda_s}}{T - \lambda\mathrm{e}^{-\lambda\cdot\frac{T}{\theta}}}.$$

We equate this to $A = \frac{2\lambda + \lambda_s}{2\lambda\lambda_s}$, and let M denote $\mathrm{e}^{-\lambda\cdot\frac{T}{\theta}}, 0 \le M \le 1$, then

$$2\lambda^3\lambda_s M^2 - \lambda(4\lambda\lambda_s T - 6\lambda - 3\lambda_s)M + 2\lambda\lambda_s T^2 - (2\lambda + \lambda_s)T = 0$$
$$\Rightarrow M = \frac{4\lambda\lambda_s T - 6\lambda - 3\lambda_s \pm \sqrt{(2\lambda + \lambda_s)\left[9(2\lambda + \lambda_s) - 16\lambda\lambda_s T\right]}}{4\lambda\lambda_s},$$
$$\frac{2\lambda + \lambda_s}{2\lambda\lambda_s} < T < \frac{9(2\lambda + \lambda_s)}{16\lambda\lambda_s}.$$
$$\Rightarrow \theta = \frac{\lambda T}{\ln\frac{4\lambda\lambda_s}{4\lambda\lambda_s T - 6\lambda - 3\lambda_s + \sqrt{(2\lambda + \lambda_s)\left[9(2\lambda + \lambda_s) - 16\lambda\lambda_s T\right]}}}, \quad A = \frac{2\lambda + \lambda_s}{2\lambda\lambda_s}.$$

4. Upper Limit on Transfer

In some cases, earnout contracts include an upper limit on the total amount to be transferred by the buyer. Let the upper limit be denoted by L. An increase in L reduces θ and increases *A*. Plausibly, $L > E(V_b) > 1$. In this section we assume the lower bound to be $T = 0$.

In this case,

$$NP = \left[A + E\min(\theta V_{bs}, L) - 2E(V_s)\right]\left[-A - E\min(\theta V_b, L) + E(V_b)\right],$$

where

$$E\min(\theta V, L) = \int_0^{\frac{L}{\theta}} \theta v f(v)\mathrm{d}v + L\int_{\frac{L}{\theta}}^{\infty} f(v)\mathrm{d}v = L - \theta\int_0^{\frac{L}{\theta}} F(v)\mathrm{d}v.$$

$$\Rightarrow NP = -A^2 - A\left(L - \theta\int_0^{\frac{L}{\theta}} F_{bs}(v)\mathrm{d}v\right) + 2AE(V_s) - A\left[L - \theta\int_0^{\frac{L}{\theta}} F_b(v)\mathrm{d}v\right]$$
$$+\left[L - \theta\int_0^{\frac{L}{\theta}} F_b(v)\mathrm{d}v\right]\left[L - \theta\int_0^{\frac{L}{\theta}} F_{bs}(v)\mathrm{d}v\right]$$
$$+2E(V_s)\left[L - \int_0^{\frac{L}{\theta}} F_b(v)\mathrm{d}v\right] + AE(V_b)$$
$$+E(V_b)\left[L - \int_0^{\frac{L}{\theta}} F_{bs}(v)\mathrm{d}v\right] - 2E(V_s)E(V_b)$$

$$\Rightarrow NP = -A^2 + A\left[-2L + \theta\left(\widehat{bs} + \hat{b}\right) + 2E\left(V_s\right) + E\left(V_b\right)\right] + L^2$$
$$+ L\left(-\theta\hat{b} - \theta\widehat{bs} + E\left(V_b\right) + 2E\left(V_s\right)\right) + \theta^2\hat{b}\widehat{bs}$$
$$+ E\left(V_s\right)\left(-2\hat{b} - 2E\left(V_b\right)\right) - E\left(V_b\right)\widehat{bs},$$

where $\hat{b} \equiv \int_0^{\frac{L}{\theta}} F_b\left(v\right)\mathrm{d}v$ and $\widehat{bs} \equiv \int_0^{\frac{L}{\theta}} F_{bs}\left(v\right)\mathrm{d}v$.

If $\hat{b} = \widehat{bs} \equiv \bar{b} \Rightarrow A = -L + \theta\hat{b} + EV_s + \frac{EV}{2}$, and also $A = L - \bar{b}\theta$

$\Rightarrow \theta^* = \frac{4L - 2EV_s - EV}{4\bar{b}}, \uparrow L$ so if L is low then θ^* needs to be low.

$A^* = \frac{2EV_s + EV}{4}$ independent of L and $\bar{b}$.

Example

Let $F_b = F_{bs} \equiv F \sim U\left[0,2\right]$, then $\bar{b} = \int_0^{\frac{L}{\theta}} \frac{v}{2}\mathrm{d}v = \frac{L^2}{4\theta^2}$, and let $F_s \sim U\left[0,1\right]$.

Then, if $L > \frac{1}{2}$, $\theta^* = \frac{L^2}{2\left(2L-1\right)}$, $A^* = \frac{1}{2}$.

5. Concluding Remarks

While earnout arrangements are quite common, it seems that their parameters have not yet been analytically determined. We aimed to address this gap.

We started with an earnout contract consisting of just two decision variables: the downpayment and the share of revenue that needs to be transferred. Initially, b was assumed to be in control of the acquired business. Then we considered a scenario where s retains control.

We then added a third decision variable in the form of an upper or a lower limit for the transfer amount.

There are other components of earnout contracts which are outside the scope of this paper, such as various adjustments, provisions, etc. As we were motivated by an actual case, where the contract involved only A and θ, we focused on these two parameters.

Future research may combine an upper and lower bound on the transfer, creating a model with four decision variables. The upper and lower bounds may be negotiated rather than given and the consequences of such situations should be further explored.

Our models assumed that both the seller and buyer are risk neutral. Since in an earnout situation both parties take a significant risk, beyond the basic performance risk of the buyer (e.g. Lukas et al., 2012), the next step should be to assume that the seller, or even both parties, are risk averse. That is likely to increase the "certain" downpayment and reduce θ.

As the party in control has better information about the actual turnover, it may have an incentive to under-report it. Ameliorating that potential problem is also a direction for future research. An objective auditor may be needed.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Broughton, K. (2024). Companies Turn to Earnouts to Find Common Ground on M & A Valuations. *The Wall Street Journal (CFO Journal), 1-4*. https://www.wsj.com/articles/companies-turn-to-earnouts-to-find-common-ground-on-m-a-valuations-146bf2c9

Chatterjee, S., & Yan, A. (2008). Using Innovative Securities under Asymmetric Information: Why Do Some Firms Pay with Contingent Value Rights? *Journal of Financial and Quantitative Analysis, 43,* 1001-1035. https://doi.org/10.1017/s0022109000014423

Dahlen, N. (2024). Earnouts in Mergers and Acquisitions: A Systematic Literature Review of a Contingent Payment Mechanism. *Management Review Quarterly, 75,* 2107-2146. https://doi.org/10.1007/s11301-024-00429-w

Georgy, A. (2024). Third Hand from a Baker (Yad Shlishit me'Ofe). *TheMarker*, 10-11.

Grant Thornton (2019). *Earn-Outs: How to Avoid Pitfalls and Protect Value*. https://www.grantthornton.co.uk/insights/earn-outs-how-to-avoid-pitfalls-and-protect-value/

Kohers, N., & Ang, J. (2000). Earnouts in Mergers: Agreeing to Disagree and Agreeing to Stay. *The Journal of Business, 73,* 445-476. https://doi.org/10.1086/209649

Lukas, E., Reuer, J. J., & Welling, A. (2012). Earnouts in Mergers and Acquisitions: A Game-Theoretic Option Pricing Approach. *European Journal of Operational Research, 223,* 256-263. https://doi.org/10.1016/j.ejor.2012.05.017

Nash, J. (1953). Two-Person Cooperative Games. *Econometrica, 21,* 128-140. https://doi.org/10.2307/1906951

Quinn, B. J. M. (2013). Putting Your Money Where Your Mouth Is: The Performance of Earnouts in Corporate Acquisitions. *University of Cincinnati Law Review, 81*, Article 3. https://scholarship.law.uc.edu/uclr/vol81/iss1/3 https://doi.org/10.2139/ssrn.1958617

Wilson, E. L., & Biemans, A. V. (2018). Earnouts and the Monte Carlo Method: Practice Tips for Implementation. *Business Valuation Update, 24,* 1-7. https://media.thinkbrg.com/wp-content/uploads/2020/06/11133104/BVU0518-Monte-Carlo-Earnouts.pdf