1 How to write out regression equations?

We estimate the effect of foreign managers on firm performance in an annual firm panel. Outcomes at firm i in year t are modeled as

$$y_{ist} = \beta F_{it} + \gamma \mathbf{X}_{it} + \alpha_i + \mu_{st} + \varepsilon_{ist}, \tag{1}$$

with F_{it} denoting an indicator taking the value one when firm i has a foreign manager in year t. The vector $\mathbf{X}_{it}$ denotes time varying firm controls. We also include firm fixed effects and sector-year fixed effects.

Regression equations are mathematical equations, not notes to yourself. They should make sense as such. Use the rules below and always check whether the algebra in your equation is correct.

1. Use the "Kézdi notation" for subscipts. Write out all dimensions that vary, even if they are related. y_{ist} for firm i in sector s in year t, even though s is, strictly speaking, a function of i and t.

2. For right-hand side variables, take careful account of the dimensions that vary. P_{st} for a sectoral price index, F_{it} for a firm variable (I could not care less about industries at this stage, unless they directly affect F_{it}).

3. Always write out the error term.

4. Variables are either single-letter variables or short words, but not both. Either γM_{it} or γEXPAT_{it}, but never $\gamma M_{it} \text{EXPAT}_{it}$.

5. If you use longer words, use the `\text{}` command so that the letters don't fall apart. EXPAT_{it} is a variable, $EXPAT_{it}$ is the product of five variables. Again, this is math.

6. Do not write out multiplication signs for interacted variables, we are used to reading mathematical formula like this. $M_{it}F_{jt}$, not $M_{it} * F_{jt}$. If you really must, to reduce complexity, use `\cdot` or `\times`, mot $*$.

7. The proper notation for fixed effects is a greek parameter indexed by what varies. For example, firm fixed effects are α_i, not $FIRM_i$ (Is there such a variable called FIRM? What values does it take?), nor $\sum_j \alpha_j D_j$ (Since D_j is zero for all other firms but $i = j$, this is the same as α_i, just much harder to read.)

8. Interacted fixed effects are μ_{st}, not $\mu_s \mu_t$. Think about what your regression is doing mathematically.

9. Don't use the same greek letter for different parameters, even for fixed effects. For example, $\alpha_i + \alpha_t$ would algeabraically mean that the time effect for year 1997 is the same as the firm effect for firm 1997. That is surely not what you meant to say.

10. If you are controlling for a non-parametric function, feel free to write $f(\text{age}_{it})$, for example. This is ok for polynomials, lowess, kernel, spline, binscatter, anything that is a function of age_{it}.

11. Use punctutation as you would in a sentence.