AI Adoption and Layoffs

Your Team

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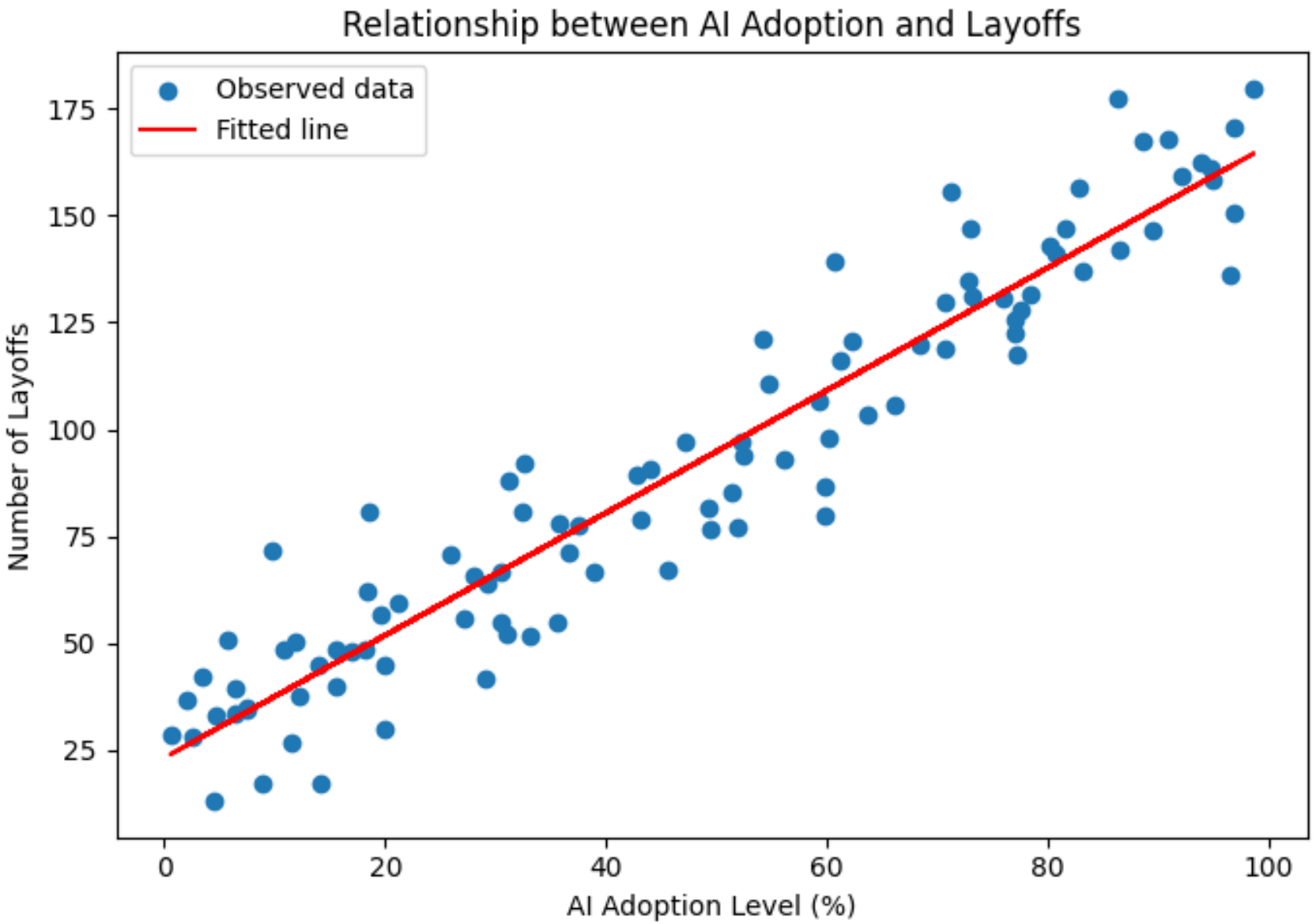
Research Question and Model Definition

- Does a higher level of AI adoption in firms correlate with a higher number of layoffs?
- We build a simple cross-sectional linear regression with synthetic data using the following model:

$$\text{Layoffs}_i = \beta_0 + \beta_1 \, \text{AI\_Adoption}_i + \varepsilon_i$$

- **AI_Adoption**$_i$: represents the degree of AI integration within firm i (e.g., automation of processes, use of machine learning tools, or AI-driven decision systems), scaled between 0 and 100
- **Layoffs**$_i$: number of employees laid off by firm i during the year
- Simulated dataset: 100 firms

Scatter Plot and Fitted Line



OLS Model Output

OLS Regression Results

Dep. Variable:	Layoffs	R-squared:	0.908
Model:	OLS	Adj. R-squared:	0.907
Method:	Least Squares	F-statistic:	968.9
Date:	Fri, 07 Nov 2025	Prob (F-statistic):	1.31e-52
Time:	11:59:07	Log-Likelihood:	-401.95
No. Observations:	100	AIC:	807.9
Df Residuals:	98	BIC:	813.1
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	23.2264	2.554	9.093	0.000	18.158	28.295
AI_Adoption	1.4310	0.046	31.127	0.000	1.340	1.522

Omnibus:	0.900	Durbin-Watson:	2.285
Prob(Omnibus):	0.638	Jarque-Bera (JB):	0.808
Skew:	0.217	Prob(JB):	0.668
Kurtosis:	2.929	Cond. No.	104.

Interpretation

- The coefficient on AI adoption is **1.4665** and it is highly significant.
- This means: for a 1-point increase in the AI adoption score, layoffs increase on average by about 1.47 units.
- Very high $R^2 = 0.905$ because the data were constructed to reflect a strong positive relationship.
- In real data we would expect more noise and lower R^2.

Conclusions and AI usage

- Our synthetic example shows a clear positive correlation between AI adoption and layoffs.
- The result is statistically strong (very small p-value).
- For an applied project, we would:
  - collect real firm-level data,
  - add control variables (firm size, sector, profitability),
  - test robustness.