**USAGE**

```
ETReg(x, y, intercept=TRUE)
```

**ARGUMENTS**

- `x`: Matrix of predictors with `p` columns and `n` rows. A column of ones will automatically be added for the intercept if `intercept=TRUE`.
- `y`: Response vector of length `n`.
- `intercept`: Should the regression include an intercept?

**VALUE**

- `coef`: Vector of estimated coefficients (including the intercept if requested).
- `cov`: The estimated variance-covariance matrix based on the asymptotic normality.
- `weights`: The final weights for each observation.
- `scale`: The value of the estimated scale of the residuals. This comes from the initial LTS estimate.
- `tau`: The lagrange multiplier parameter.
NOTES

This function performs robust linear regression via exponential tilting.

REFERENCE


EXAMPLE

n=20
p=4

```r
## This first dataset results in a fit different than the OLS estimator
set.seed(77)
x = matrix(rnorm(n*p), ncol=p)
y = rmorm(n)
example_fit = ETReg(x, y)
example_fit$coef
```

```
Intercept           X1                X2                X3                X4
-0.01552365    0.10581029    -0.20041610    0.06398866      -0.49490805
```

```r
lm(y~x)$coef
```

```
(Intercept)          x1                x2                x3                x4
-0.09431809    0.12460983    -0.17012818    0.02800127      -0.53724436
```

## This second dataset results in the solution being the OLS estimator.
## The initial robust scale estimate is larger than that obtained by equal weighting.
## Hence OLS satisfies the constraints.

```r
set.seed(78)
x = matrix(rnorm(n*p), ncol=p)
y = rmorm(n)
example_fit = ETReg(x, y)
```