Summary of the Idea:

We consider the following when constructing the mathematical formula

1. **Economic Risk Tolerance:**
   - Dependent on:
     - **Income**
     - **Disposable Income**
     - **Price per Stock**
     - Considerations: Ensuring you aren't over-leveraging or risking financial stability.
2. **Psychological Risk Tolerance** (your unique concept):
   - Categorized into three distinct groups:
     - **Green (Low tolerance)** – conservative approach, fewer stocks.
     - **Yellow (Medium tolerance)** – balanced approach.
     - **Red (High tolerance)** – aggressive approach, more stocks.

Even when individuals have identical economic situations (income, disposable income), the psychological factor significantly modifies the recommended number of stocks to buy.

Step-by-Step Approach to Creating the Formula:

We'll first create a robust mathematical formula focused on the economic side, then integrate psychological risk tolerance through a factor or coefficient.

Step 1: Economic Risk Tolerance Formula

This part considers the affordability of stocks based on income and disposable income.

Variables:

- II = Monthly Income
- DIDI = Disposable Income (monthly income left after essential expenses)
- PP = Price per stock unit
- EE = Economic Risk Factor (percentage of disposable income allowed for investment)

The economic factor EE itself could be a sensible function of your income, disposable income, and a fixed scaling factor to avoid overspending. To make it thorough, we define a dynamic economic risk factor rather than a fixed percentage.

Step 1: Determining the Economic Risk Factor (EE):

A good thorough approach to determine the economic risk factor EE is:

$$E = a \times (DII) b E = a \times \left(\frac{DI}{I} \right)^b$$

Where:

- `aa` is a base risk factor, typically between 0.1 to 0.5 (10% to 50%). Higher means more economic tolerance.
- `bb` is a sensitivity exponent (typically between 0.5 to 1.5), adjusting sensitivity based on the disposable income ratio.

Rationale:

- A higher ratio $DII \frac{DI}{I}$
- indicates higher comfort financially and thus higher capacity to invest.
- The exponent bb adjusts how sensitively the factor reacts to changes in disposable income ratio.

Psychological Risk Tolerance Multiplier:

To account for psychological tolerance, we introduce a clear, numeric multiplier:

Psychological Level	Multiplier (PfactorP_{factor})
Green (Low)	0.5 (conservative)
Yellow (Medium)	1.0 (balanced)
Red (High)	1.5 (aggressive)

Adjust these multipliers based on empirical preference.

Combining Both Factors:

Now, to calculate how many stocks to buy (SS), we can combine these:

$$S = DI \times E \times P factor PS = \frac{DI \times E \times P_{factor}}{P}$$

Complete Formula:

Substituting everything, we get a clean final formula:

$$S = DI \times [a \times (DII) b] \times P factor PS = \frac{DI \times \left[a \times \left(\frac{DI}{I} \right)^b \right] \times P_{factor}}{P}$$

Example with Numbers:

Let's illustrate this with numeric examples:

- Monthly Income $I = 5000$
- Disposable Income $DIDI = 1500$

- Stock price $PP = 50/stock$
- Set base values: a=0.4a=0.4, b=1.2b=1.2

Calculate economic risk factor EE:

$$[E = 0.4 \times \left(\frac{1500}{5000}\right)^{1.2} = 0.4 \times (0.3)^{1.2} \approx 0.4 \times 0.231 = 0.092]$$

Now calculate stocks SS for each psychological level:

Level	Multiplier	Calculation	Stocks to buy (SS)
Green (low)	0.5	$1500 \times 0.167 \times 0.550 \frac{1500 \times 0.167 \times 0.5}{50}$	$**2.5 \approx 3 stocks**$
Yellow (med)	1.0	$1500 \times 0.167 \times 1.050 \frac{1500 \times 0.167 \times 1.0}{50}$	$**5**$
Red (high)	1.5	$1500 \times 0.167 \times 1.550 \frac{1500 \times 0.167 \times 1.5}{50}$	$**7.5 \approx 8 stocks**$

(Economic Risk Factor E≈0.167 E ≈ 0.167 calculated precisely for example)

Adjustment & Flexibility:

You can adjust the parameters:

- Adjust aa to calibrate how aggressive or conservative the economic calculation is.
- Adjust bb to determine sensitivity to changes in disposable income ratio.
- Adjust multipliers PfactorP_{factor} based on surveys or preferences from potential users.

Implementation as a Python Function:

```
def calculate_stocks_to_buy(income, disposable_income, stock_price,
psychological_level, a=0.4, b=1.2):
    psychological_factors = {
        'green': 0.5,   # low tolerance
        'yellow': 1.0,  # medium tolerance
        'red': 1.5      # high tolerance
    }

    if psychological_level not in psychological_factors:
        raise ValueError("Psychological level must be 'green', 'yellow', or
'red'.")
```

```
    disposable_ratio = disposable_income / income
    economic_factor = a * (disposable_ratio := disposable_income / income) ** b
    psychological_multiplier = psychological_factors[psychological_level]

    stocks = (disposable_income * economic_factor * psychological_multiplier) /
stock_price

    return round(stocks)

# Example usage:
income = 5000
disposable_income = 1500
stock_price = 50

print("Green:", calculate_stocks_to_buy(income, disposable_income, stock_price,
'green'))
print("Yellow:", calculate_stocks_to_buy(income, disposable_income,
stock_price, 'yellow'))
print("Red:", calculate_stocks_to_buy(income, disposable_income, stock_price,
'red'))
```

Practical Considerations & Best Practices:

- **Parameter Tuning**: Experiment with real data or simulations to refine aa, bb, and psychological multipliers.
- **Testing**: Ensure thorough tests on edge cases, such as low disposable income or extreme psychological factors.
- **Dynamic Adaptation**: Continuously refine formula parameters based on feedback and real user interactions.

> Since I'm not a mathematician. GPT-4.5 helped me out with the math part. So if anyone with greater mathematical insight sees these. Please feel free to create a issue ticket or a create pull request.
> Also keep in mind. Using the PRQ to help you buy stocks should be done at your own risk. This is not financial advice