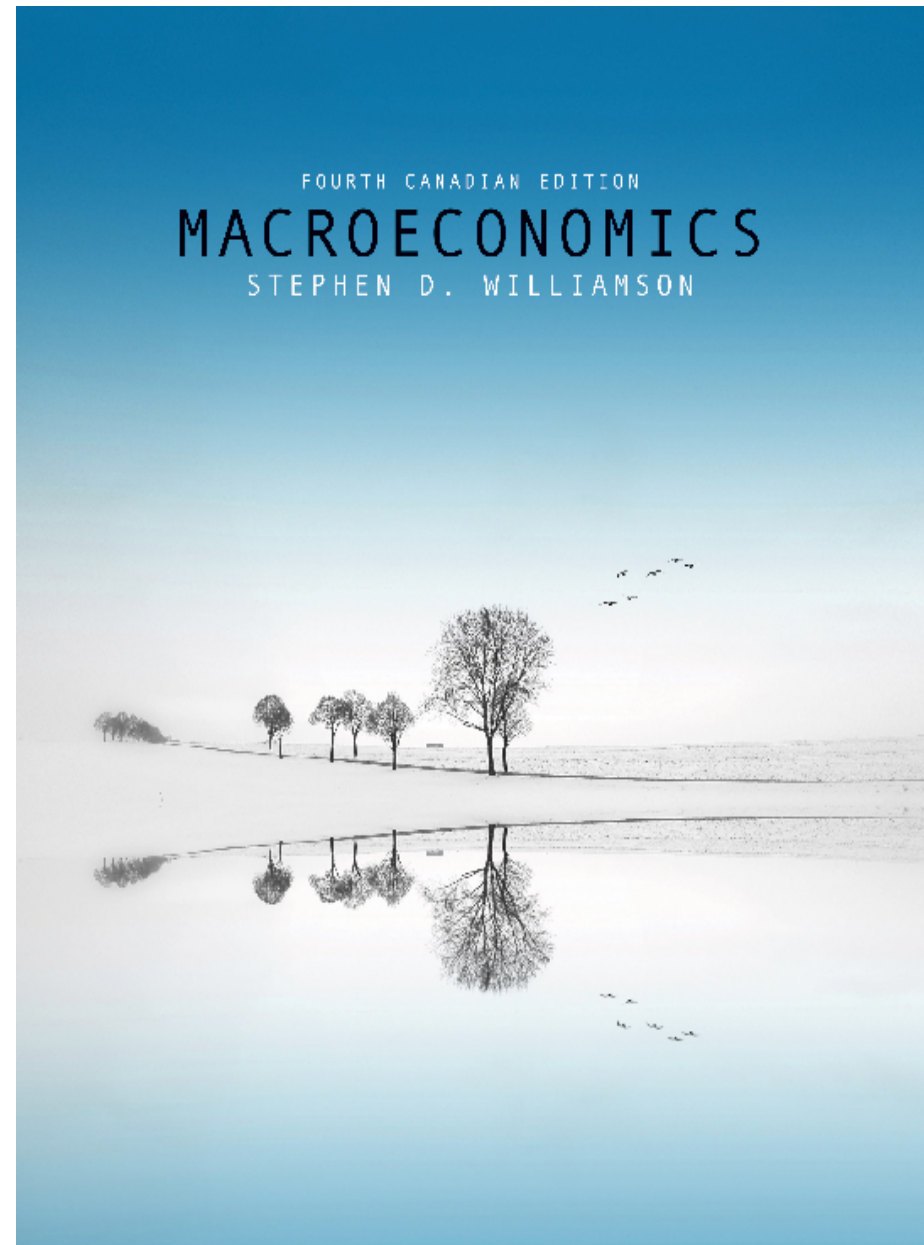


Chapter 9

A Two-Period Model: The Consumption- Savings Decision and Credit Markets

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Chapter 9 Topics



- Consumer's consumption/savings decision – responses of consumer to changes in income and interest rates.
- Government budget deficits and the Ricardian Equivalence Theorem.

Budget Constraints



The consumer's current-period budget constraint:

$$c + s = y - t$$

Budget Constraints



The consumer's future-period budget constraint:

$$c' = y' - t' + (1 + r)s$$

Simplify



Solve the future-period budget constraint for s :

$$s = \frac{c' - y' + t'}{1 + r}$$

Next,



Substitute in the current-period budget constraint obtaining lifetime budget constraint:

$$c + \frac{c' - y' + t'}{1 + r} = y - t$$

Consumer's Lifetime Budget Constraint



Substitute in the current-period budget constraint obtaining lifetime budget constraint:

$$c + \frac{c'}{1+r} = y - t + \frac{y' - t'}{1+r}$$



Consumer's Lifetime Wealth

$$we = y - t + \frac{y' - t'}{1 + r}$$

Simplified Lifetime Budget Constraint



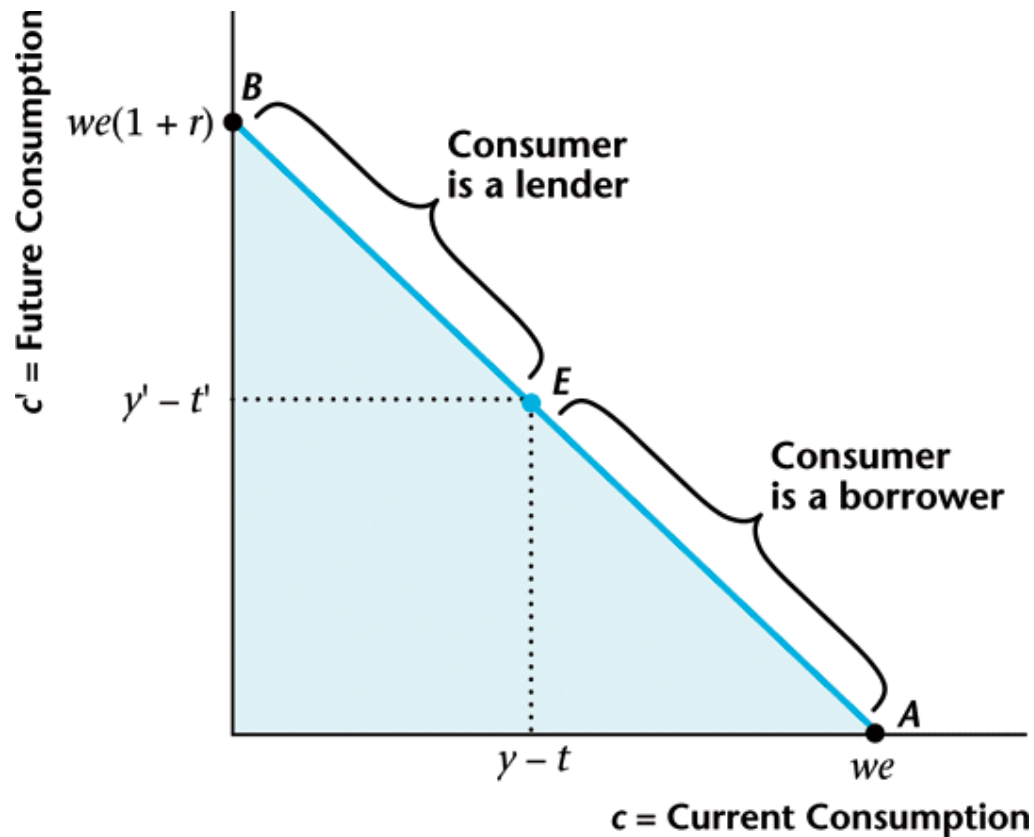
$$c + \frac{c'}{1+r} = we$$

Lifetime Budget Constraint: Slope-Intercept



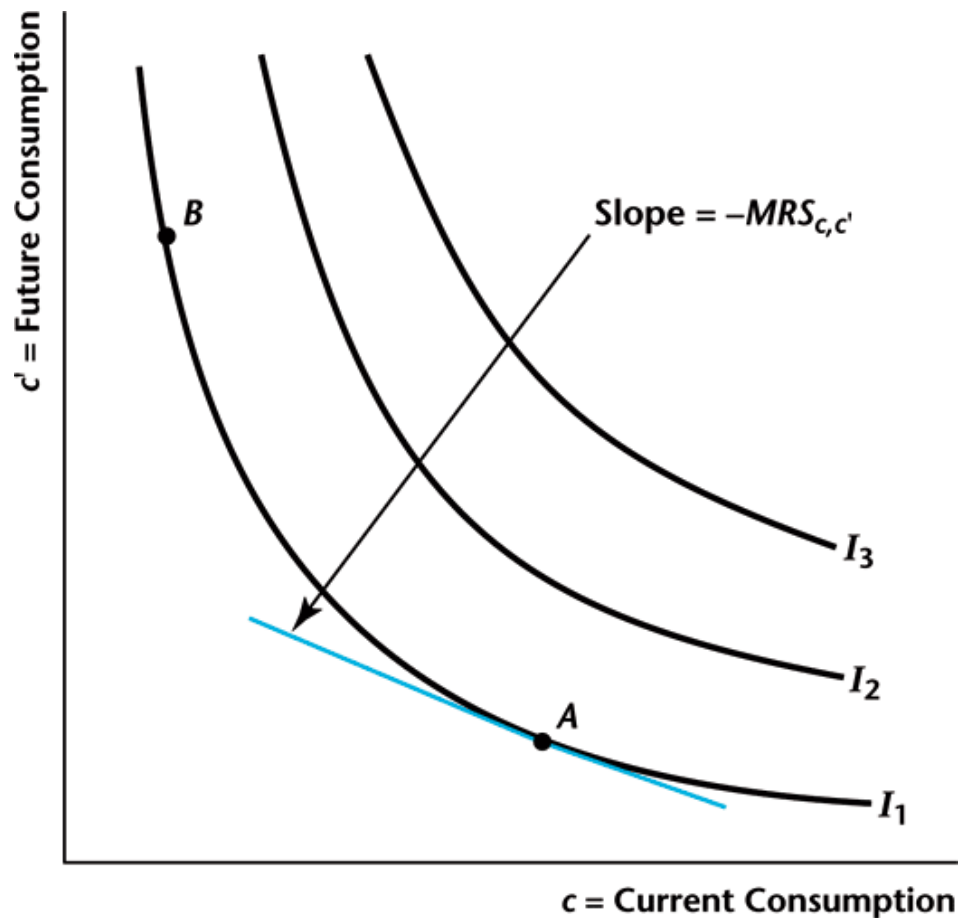
$$c' = -(1 + r)c + we(1 + r)$$

Consumer's Lifetime Budget Constraint





A Consumer's Indifference Curves



Sara's Desire for Consumption Smoothing



	Week 1 Coconuts	Week 2 Coconuts	Total Consumption
Bundle 1	5	15	20
Bundle 2	17	3	20
Preferred Bundle	11	9	20

Optimization

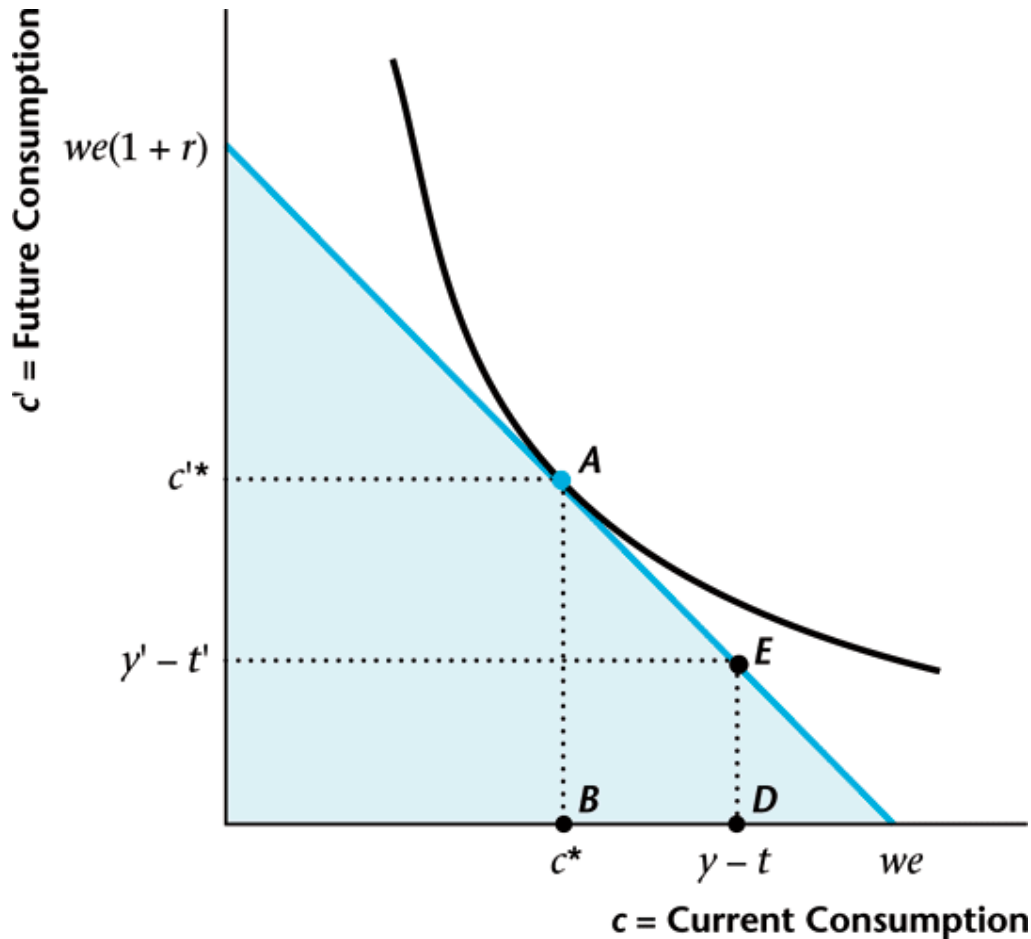


Marginal condition that holds when the consumer is optimizing:

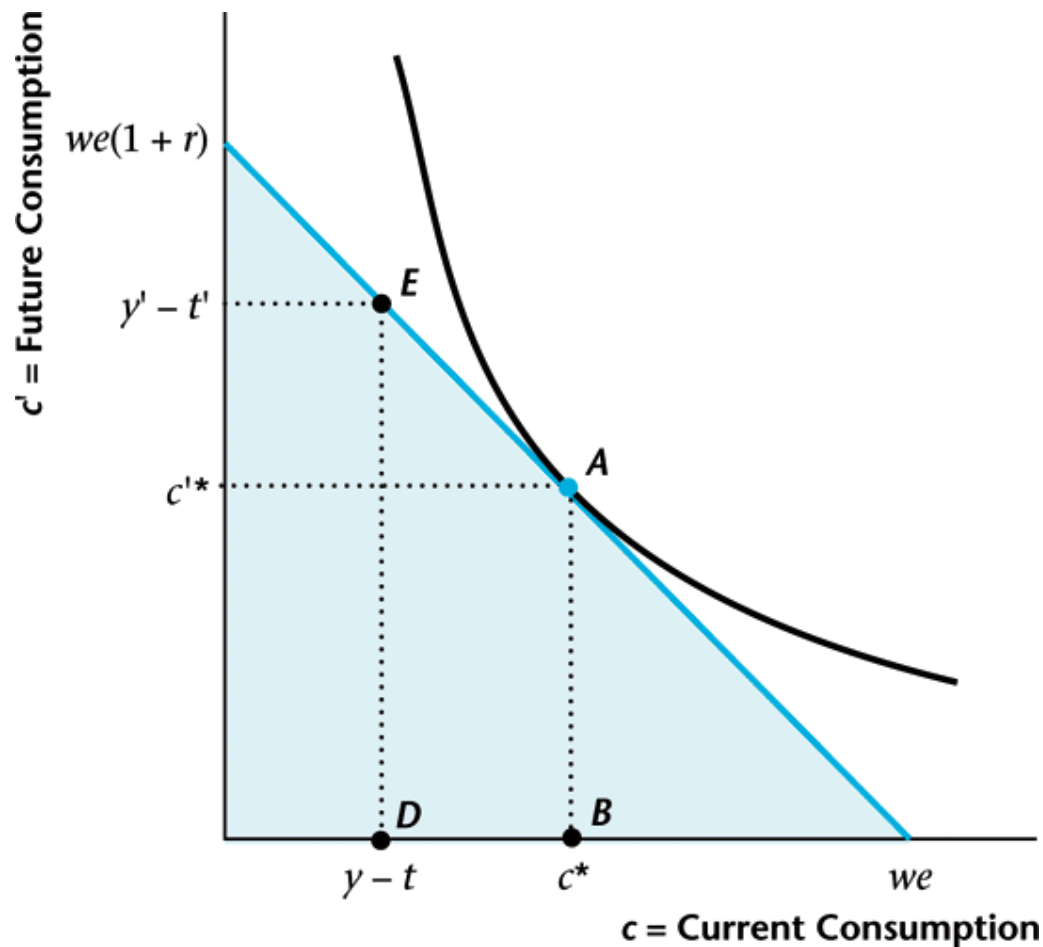
$$MRS_{c,c'} = 1 + r$$



A Consumer Who Is a Lender



A Consumer Who Is a Borrower

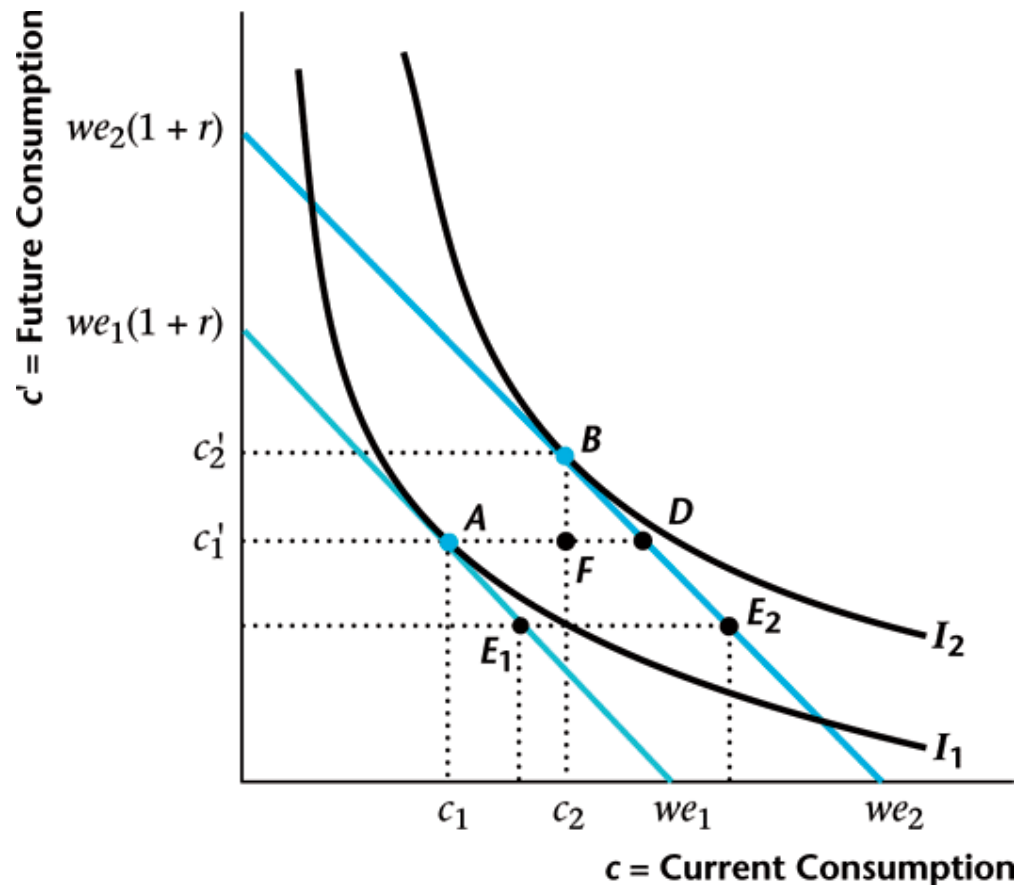


An Increase in Current Income for the Consumer



- Current and future consumption increase.
- Saving increases.
- The consumer acts to smooth consumption over time.

The Effects of an Increase in Current Income for a Lender



Observed Consumption-Smoothing Behaviour



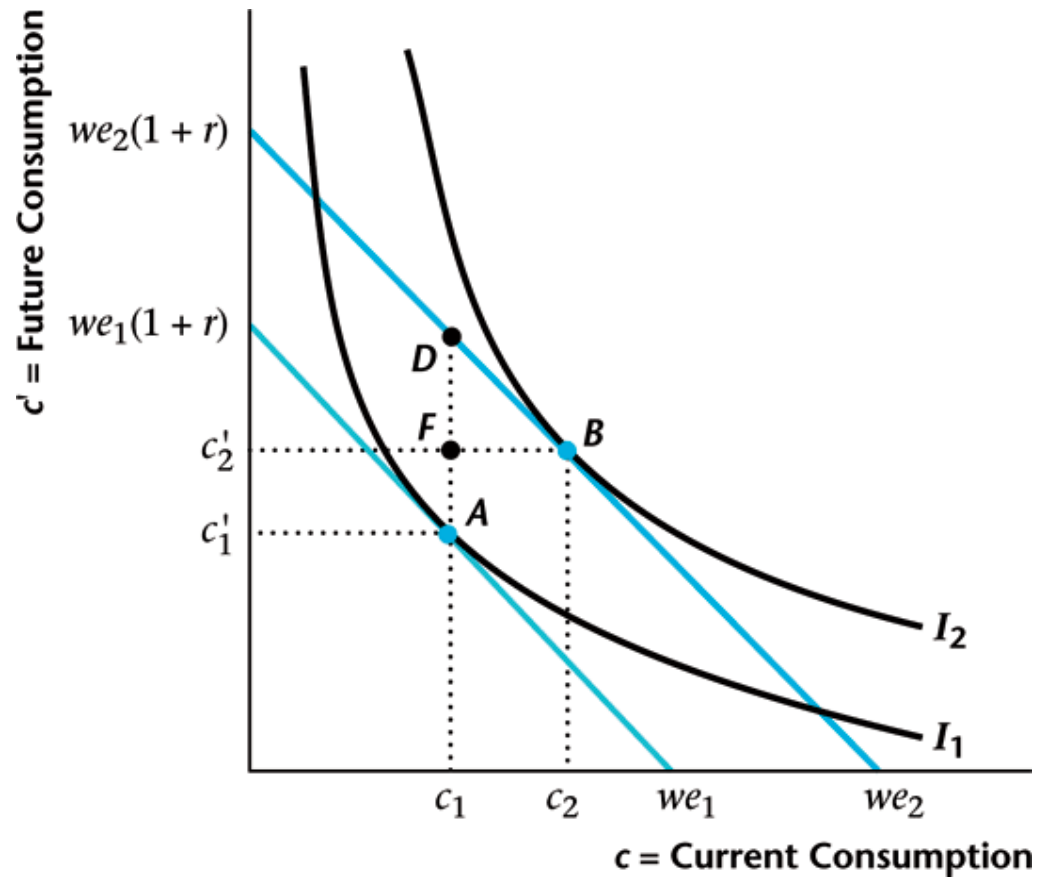
- Aggregate consumption of non-durables and services is smooth relative to aggregate income, but the consumption of durables is more volatile than income.
- This is because durables consumption is economically more like investment than consumption.

An Increase in Future Income for the Consumer



- Current and future consumption increase.
- Saving decreases.
- Again, these results are explained by the consumer's motive to smooth consumption over time.

An Increase in Future Income

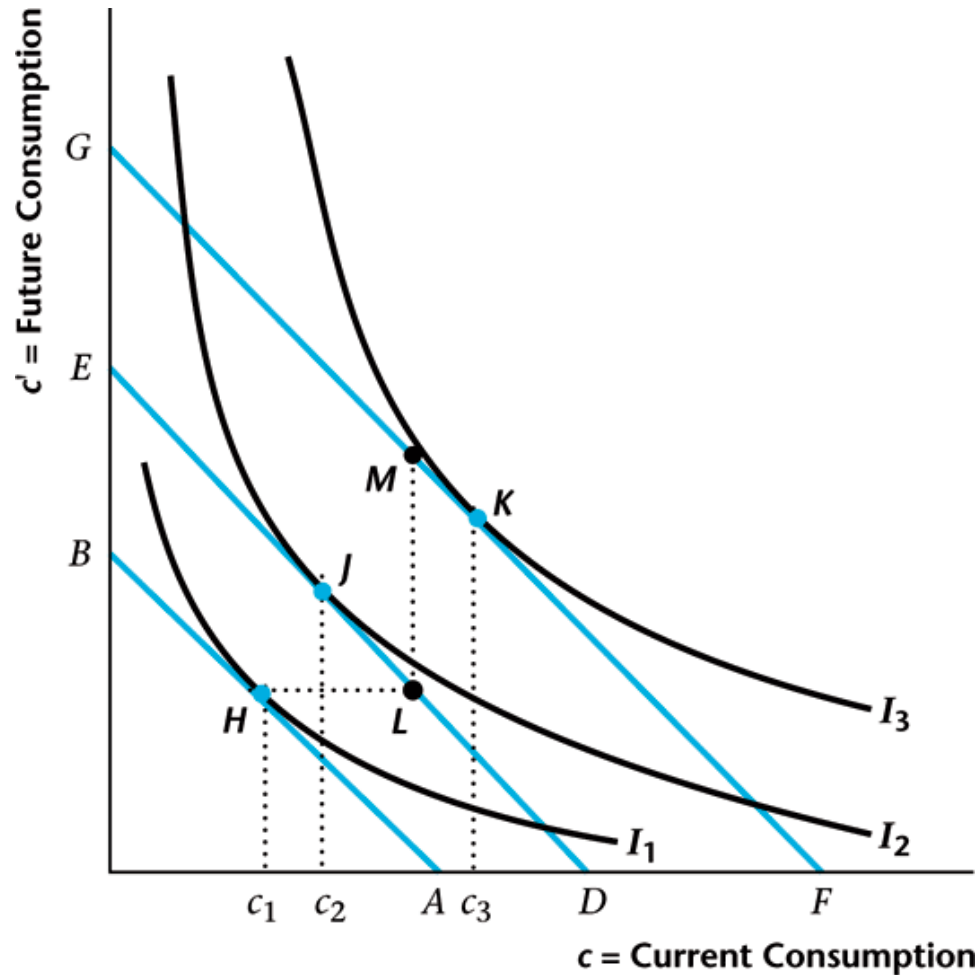


Temporary and Permanent Increases in Income

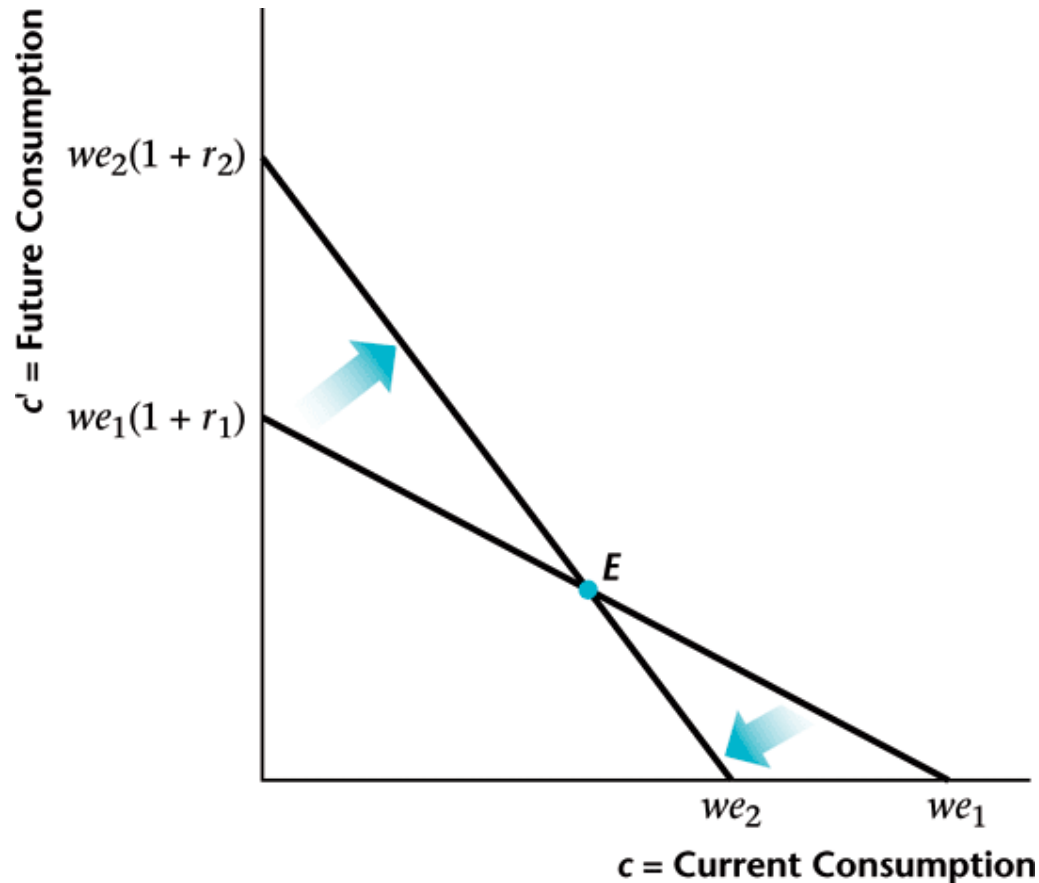


- As a permanent increase in income will have a larger effect on lifetime wealth than a temporary increase, there will be a larger effect on current consumption.
- A consumer will tend to save most of a purely temporary income increase.

Temporary Versus Permanent Increases in Income



An Increase in the Real Interest Rate

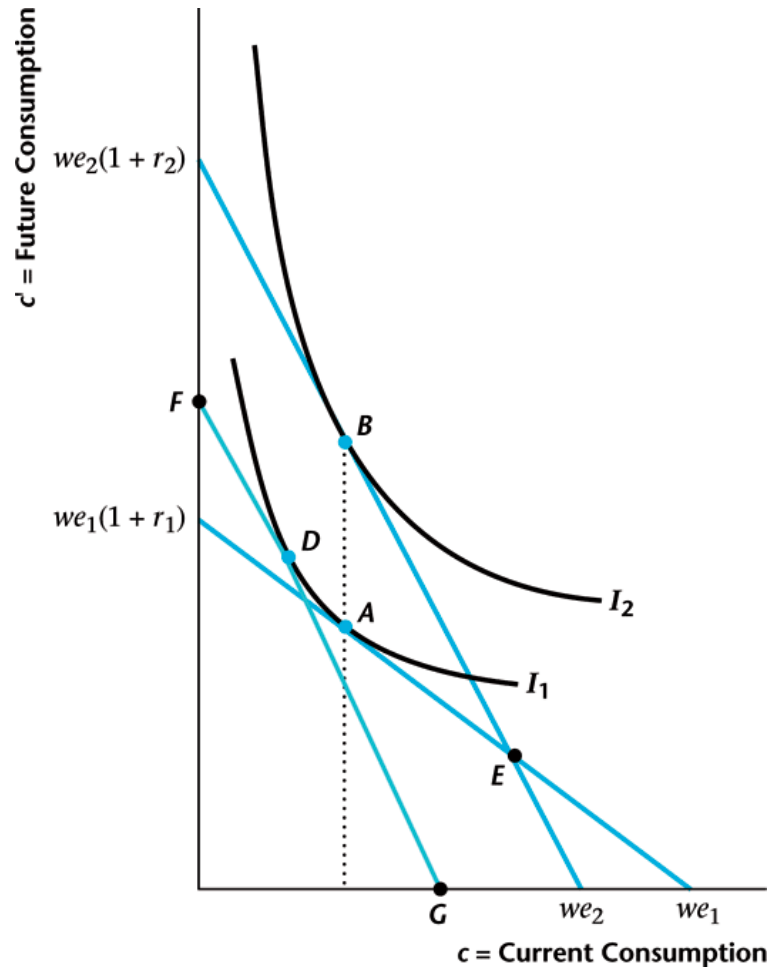


An Increase in the Market Real Interest Rate

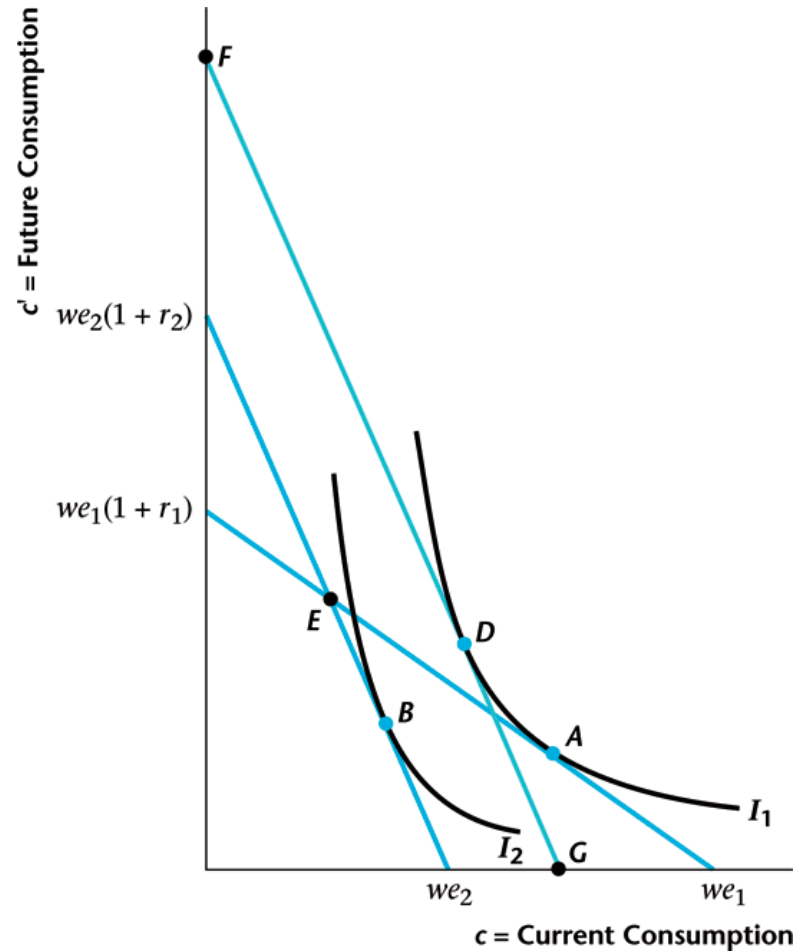


An increase in the market real interest rate decreases the relative price of future consumption goods in terms of current consumption goods – this has income and substitution effects for the consumer.

An Increase in the Real Interest Rate for a Lender



An Increase in the Real Interest Rate for a Borrower



Effects of an Increase in the Real Interest Rate for a Lender



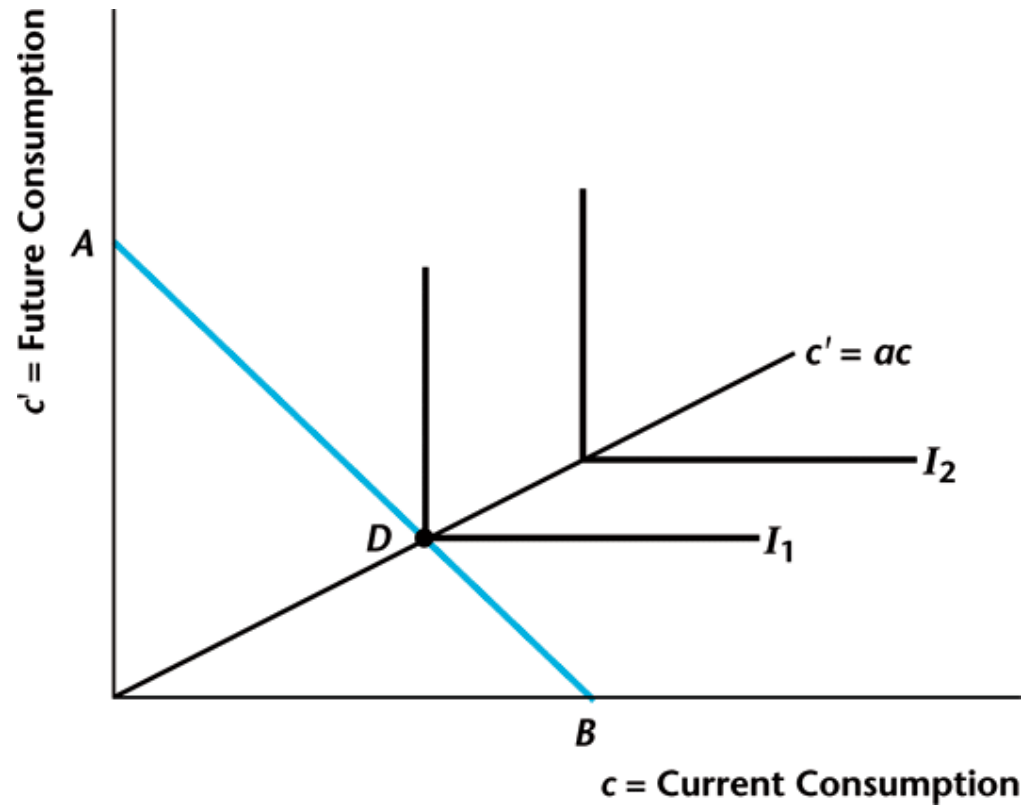
Current consumption	?
Future consumption	Increases
Current savings	?

Effects of an Increase in the Real Interest Rate for a Borrower



Current consumption	Decreases
Future consumption	?
Current savings	Increases

Example with Perfect Complements Preferences





Perfect Complements Example

With perfect complements, the ratio of future consumption to current consumption is constant.

$$c' = ac$$

The consumer's budget constraint must hold.

$$c + \frac{c'}{1+r} = we$$

Perfect Complements Example



With perfect complements we can solve explicitly for current and future consumption:

$$c = \frac{we(1+r)}{1+r+a}$$

$$c' = \frac{awe(1+r)}{1+r+a}$$

Perfect Complements Example



Substituting for lifetime wealth gives:

$$c = \frac{(y - t)(1 + r) + y' - t'}{1 + r + a}$$

$$c' = a \left[\frac{(y - t)(1 + r) + y' - t'}{1 + r + a} \right]$$

Government Budget Constraints



The government's current-period budget constraint:

$$G = T + B$$

Government Budget Constraints



The government's future-period budget constraint:

$$G' + (1 + r)B = T'$$

Government Budget Constraints



The government's *present-value budget constraint*:

$$G + \frac{G'}{1+r} = T + \frac{T'}{1+r}$$

Credit Market Equilibrium Condition



Total private savings is equal to the quantity of government bonds issued in the current period.

$$S^p = B$$

Income-Expenditure Identity



Credit market equilibrium implies that the income-expenditure identity holds.

$$Y = C + G$$

Ricardian Equivalence



The Ricardian Equivalence Theorem is illustrated algebraically, numerically, and in two graphs.

Ricardian Equivalence



Key equation: The consumer's lifetime tax burden is equal to the consumer's share of the present value of government spending – the timing of taxation does not matter for the consumer.

$$t + \frac{t'}{1+r} = \frac{1}{N} \left(G + \frac{G'}{1+r} \right)$$

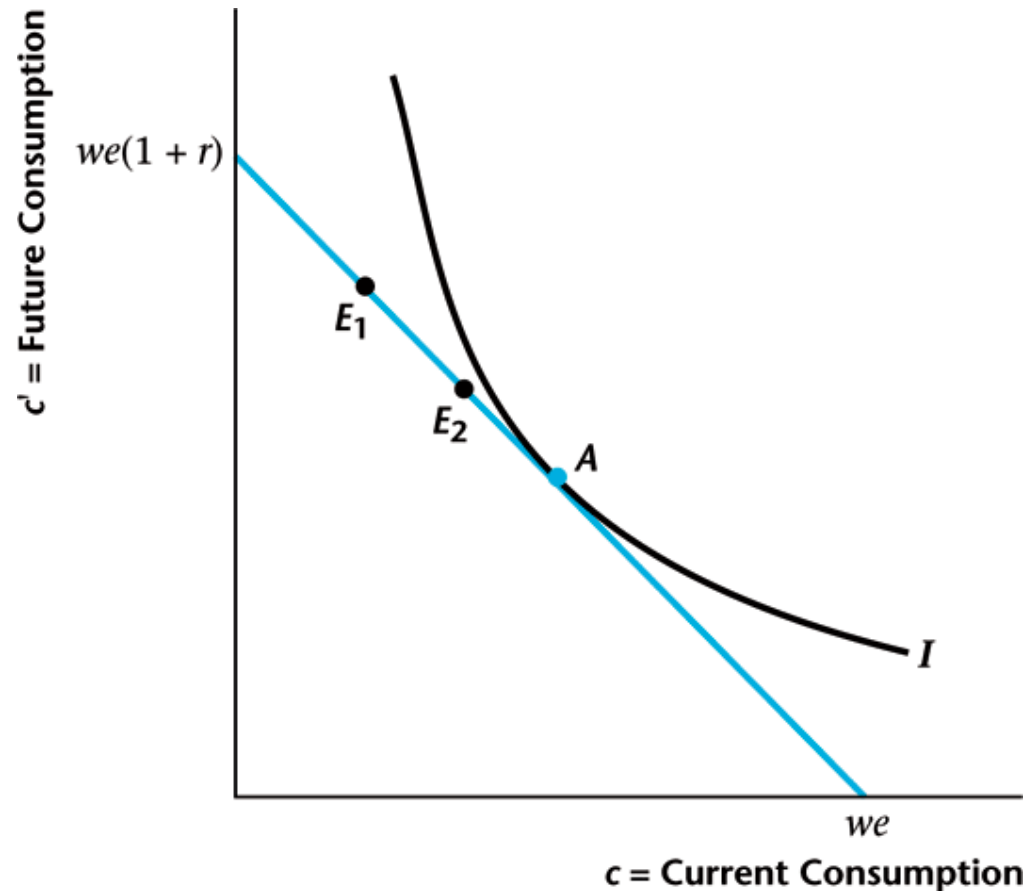
Ricardian Equivalence



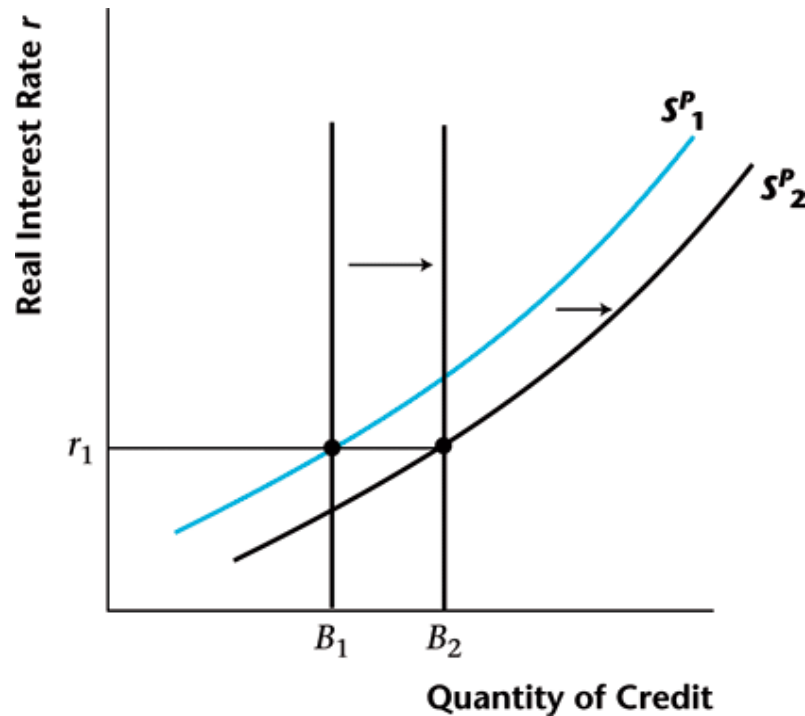
Then, substitute in the consumer's budget constraint – taxes do not matter in equilibrium for the consumer's lifetime wealth, just the present value of government spending.

$$c + \frac{c'}{1+r} = y + \frac{y'}{1+r} - \frac{1}{N} \left[G + \frac{G'}{1+r} \right].$$

Ricardian Equivalence with a Cut in Current Taxes for a Borrower



Ricardian Equivalence and Credit Market Equilibrium



What Can Make Ricardian Equivalence Fail?



- Distributional effects across individuals at a point in time.
- Distributional effects across generations.
- Taxes are distortionary.
- Credit market imperfections.