

# Calculating with our Money Demand Function

## Part 2

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	2.250
4	\$158.4	\$237.6	\$86.4			\$324	\$324		3.375



Lectures in Macroeconomics- Charles W. Upton

# The Basic Tableau

## Calculations in Real terms

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	1.500
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Calculating with our Money Demand Function-Part 2

# The Basic Tableau

## Calculations in Real terms

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
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3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	2.250
4	\$158.4	\$237.6	\$86.4			\$324	\$324		3.375



Calculating with our Money Demand Function-Part 2

# The Surprise Column

## Calculations in Real terms

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	2.250
4	\$158.4	\$237.6	\$86.4			\$324	\$324		3.375



Calculating with our Money Demand Function-Part 2

# Familiar Friends

## Calculations in Real terms

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	2.250
4	\$158.4	\$237.6	\$86.4			\$324	\$324		3.375



Calculating with our Money Demand Function-Part 2

# Consumption and Money Demand

## Calculations in Real terms

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	2.250
4	\$158.4	\$237.6	\$86.4			\$324	\$324		3.375



Calculating with our Money Demand Function-Part 2

## Starting

Calculations in Real terms									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324			3.375

$$c_1 = \frac{1}{4 + 3\xi} z_1 = \frac{1}{4 + 3(\frac{1}{3})} 480 = \frac{1}{5} 480 = 96$$

$$m_1 = \xi \frac{1 + r_N}{r_N} c_1 = \left(\frac{1}{3}\right) \frac{1 + 1.25}{1.25} 96 = 57.6$$

Calculations in Real terms									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324			3.375

## Demand Period 1

Calculations in Real terms									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324			3.375

## Carry-over, Period 2

$$(\$230.4) = (1 + r^R)(\$153.6) = 1.5(\$153.6)$$

$$38.4 = \frac{1}{1 + \eta} 57.6 = \frac{1}{1.5} 57.6$$

Calculations in Real terms									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324			3.375

## Wealth, Period 2

$z =$  Present Value of Current & Future Income + Carryover Plus Real Return + Money Balances Carried Over

$$z = \$720 - \$230.4 + \$38.4 = \$528$$

Calculations in Real terms									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324			3.375

$$c_2 = \frac{1}{3 + 2\xi} z_2 = \frac{1}{3 + 2(\frac{1}{3})} 528 = \frac{3}{11} 528 = 144$$

$$m_2 = \xi \frac{1 + r_N}{r_N} c_2 = \left(\frac{1}{3}\right) \frac{1 + 1.25}{1.25} 144 = 86.4$$

Calculations in Real terms									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	
1				\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324			3.375

## Assets, End of Period 2

Assets Plus Real Return	\$230.4
Plus: Wage Income	\$300.0
Less: Consumption	\$144.0
Less: Increase in Money Holdings	\$48.0
[ $\$86.4 - \$38.4$ ]	
<b>Equals: Assets, end of Period</b>	<b>\$122.4</b>

  

	Over	Return								Price Level
1				\$480	\$480	\$96	\$57.6	\$(153.6)		1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324				3.375

## Carry-over Period 2

Calculations in Real terms										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
	Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	Price Level
1					\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324				3.375

## Wealth, Period 3

Calculations in Real terms										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
	Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	Price Level
1					\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324				3.375

$$c_3 = \frac{1}{2 + \xi} z_3 = \frac{1}{2 + 1(\frac{1}{3})} 504 = \frac{3}{7} 504 = 216$$

$$m_3 = \xi \frac{1 + r_N}{r_N} c_3 = \left(\frac{1}{3}\right) 1 + 1.25 \cdot 216 = 129.6$$

Calculations in Real terms										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
	Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	Price Level
1					\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324				3.375

## Assets, End of Period 3

Assets Plus Real Return	\$183.6
Plus: Wage Income	\$630.0
Less: Consumption	\$216.0
Less: Increase in Money Holdings	\$72.0
[ $\$129.6 - \$57.6$ ]	
<b>Equals: Assets, end of Period</b>	<b>\$158.4</b>

  

	Over	Return								Price Level
1				\$480	\$480	\$96	\$57.6	\$(153.6)		1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324				3.375

## From Period 3 to 4

Calculations in Real terms										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Price Level
	Non-monetary Assets Carried Over	Carry over Plus Real Return	Money Balances Carried Over	Wage Income	Present Value of Future Income	Wealth	C	Money Holdings	Assets, End of Period	Price Level
1					\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4		\$324	\$324				3.375

## The Last Period

$$c_4 = \frac{1}{1 + 0\xi} z_4 = \frac{1}{1} 324 = 324$$

$$m_4 = 0$$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Non-monetary Assets Carried Over	Plus Real Return	Carried Over	Income	Future Income			Money Holdings	Assets, End of Period	Price Level
1					\$480	\$480	\$96	\$57.6	\$(153.6)	1.000
2	\$(153.6)	\$(230.4)	\$38.4	\$300	\$720	\$528	\$144	\$86.4	\$(122.4)	1.500
3	\$(122.4)	\$(183.6)	\$57.6	\$630	\$630	\$504	\$216	\$129.6	\$158.4	2.250
4	\$158.4	\$237.6	\$86.4			\$324	\$324			3.375

End

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