A model of a currency union with endogenous money and saving-investment imbalances

Dr. Dirk Ehnts
Guest lecturer
Berlin School of Economics and Law
dirk@hwr-berlin.de
Outline of this talk

1. Introduction

2. IS/LM and IS/PC/MR models

3. IS/MY model
   a. Endogenous money (MY)
   b. The real economy
   c. Savings-investment imbalances (IS)

4. Economic policy

5. Conclusion
Some general facts (I)

Some general facts (II)

**Euro zone unemployment**

Unemployment rate - percent

- Spain 23.6
- Greece 21
- Portugal 15
- Ireland 14.7
- France 10
- Italy 9.3
- Germany 5.7

Source: Thomson Reuters Datastream, Eurostat

Reuters graphic/Scott Barber 2012-04-02
Some general facts (III)

Why is this crisis so difficult?

Assets of some (Germany etc.) are liabilities of others (Greeks, Spaniards, Irish, etc.).

Economics = politics!
Problem:

to explain the EMU crisis, existing models do not allow to show the whole „story“ and do not lead to the main issues.

The European Commission (2009, 26) has recognized that:

„a large part of the divergence in the current account in the euro area since the late 1990s can be traced back to domestic demand. There have been considerable and persistent differences in domestic demand across Member States since the launch of the euro.“

1. Introduction
“differences in domestic demand across Member States since the launch of the euro.”

„But where we differ is that I believe that within a monetary union the large capital inflows associated with optimism (or neglect of dangers) moving to particular countries or regions can still create expansions of demand there that lead to large changes in relative prices between traded and non-traded goods.“

**Sleepwalking with Heiner**
by Robert Johnson on August 04, 2012
“differences in domestic demand across Member States since the launch of the euro.”

1. Introduction

“differences in domestic demand across Member States since the launch of the euro.”

1. Introduction

Figure 3 – Domestic Credit to GDP

In a tripartite agreement in 1999 government and negotiating partners on the labour market agreed not to allow growth of nominal wages along the lines of productivity growth and the inflation target of two percent (hitherto the traditional German approach) for the future but to remain clearly below that line. […] This implied that German ULC growth and its inflation rate would systematically remain below the commonly agreed inflation target in EMU.

The Heart of the Euro Problem: A Response to INET's Rob Johnson by Heiner Flassbeck on August 08, 2012

1. Introduction
“differences in domestic demand across Member States since the launch of the euro.”

1. Introduction

Source: European Commission
Note: ULCs are computed as the ratio between compensation per employee and real GDP per employed person

“differences in domestic demand across Member States since the launch of the euro.”

“differences in domestic demand across Member States since the launch of the euro.”

“differences in domestic demand across Member States since the launch of the euro.”

Source: US Bureau of Economic Analysis
Note: ULCs are computed as the ratio between compensation per nonfarm employee and real GDP per employed person.


1. Introduction
Problem (2):

Savings-investment imbalances, which are the financial side of current account imbalances, are not part of textbook models.

We know from the balance of payments the following ex-post identity:

\[(S_p - I) + (T - G) = (EX - IM)\]

Private sector  Public Sector  External Sector

1. Introduction
Problem (2):

\[ Y = C + I + G + CA \]  \hspace{1cm} (1) \\
\[ CA = X - M \]  \hspace{1cm} (2) \\
\[ CA = Y - (C + I + G) \]  \hspace{1cm} (3) \\
\[ S = Y - C - G \]  \hspace{1cm} (4) \\
\[ S = I + CA \]  \hspace{1cm} (5) \\
\[ S_p = Y - C - T \]  \hspace{1cm} (6) \\
\[ S_g = T - G \]  \hspace{1cm} (7) \\

\[ (S_p - I) + (T - G) = (EX - IM) \]  \hspace{1cm} (8)
Problem (2):

Given a more or less balanced budget \(- (T-G) = 0\) – any increase in imports over exports must be financed by an increase in private sector debt.

\[
\begin{align*}
\text{minus} & \quad + \quad \text{zero} \\ (S_p - I) & \quad + \quad (T - G) \\ \text{Private sector} & \quad \text{Public Sector} \\ \text{minus} & \quad = \quad (EX - IM) \\ \text{minus} & \quad = \quad \text{External Sector}
\end{align*}
\]
Problem (2):

If any increase in imports over exports must be financed by an increase in private sector debt, then the next question is:

How does that actually work?

Textbooks tell us that money buys things and that the money supply is set by the central bank.
Problem (2):

If this is how things work, than deposits at banks will allow banks to create loans …

… however, none other than Kydland and Prescott (1990) have written:

„There is no evidence that either the monetary base or M1 leads the cycle, although some economists still believe this monetary myth. Both the monetary base and M1 series are generally procyclical and, if anything, the monetary base lags the cycle slightly.“
The financial press tells us that the ECB sets the interest rate (actually, more than one), not the money supply!

1. Introduction
Problem (3):

If this is not how things work, than perhaps loans will create deposits?

The other idea missing is the view of money as endogenous as clearly the ECB sets the interest rate, not the monetary aggregate. As Lavoie (1985, 67) states:

\[\text{[L]oans make deposits. Banks do not wait for the appropriate amount of liquid resources to exist to provide new loans to the public (mainly firms).}\]
If loans make deposits, than banks create money endogenously. They do not need cash to make new loans but just enter some numbers on their keyboard to make the balance sheet longer.

<table>
<thead>
<tr>
<th>Periphery Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loans</td>
</tr>
<tr>
<td>+100</td>
</tr>
</tbody>
</table>

Reserves must be put at the ECB at 1% of total deposits. Also, more liquidity might be needed for clearing. Can these banks perhaps borrow from the ECB?

1. Introduction
... sure they can!

Non-technical summary

Repo auctions are the predominant instrument for the implementation of monetary policy of the European Central Bank (ECB). Repo rates govern short-term interest rates and the availability of repo credit determines the liquidity of the European banking sector. The ECB conducts repo auctions as weekly main refinancing operations (MRO) with a (bi)weekly maturity and as monthly longer term refinancing operations (LTRO) maturing after three months. Although MROs are the ECB’s primary policy instrument, LTROs are far from negligible. In 2003, refinancing via LTROs amounts to 45 bln Euro which is about 20% of overall liquidity provided by the ECB. This paper analyzes banks’ bidding behavior in LTROs to shed more light on the determinants of banks’ reserve management and the role of LTROs within the monetary policy framework of the ECB.

1. Introduction

... sure they do!

1. Introduction

… and then the domestic lending was financed by endogenous money first and …

**Figure 3 – Domestic Credit to GDP**

… and later the financial assets were bought either directly or indirectly by German banks and their subsidiaries (if they did not finance them in the first place).

That would explain the losses and/or bankruptcies of German banks.
The Machinery of the mind can only transform knowledge, but never originate it, unless it be fed with facts of observations.

Charles S. Pierce in *How to Make Our Ideas Clear* (1878)

To *think* is to forget a difference, to generalize, to *abstract*.

Jorge Luis Borges in *Funes the Memorious* (1942)

Now that we know what is within our reach and what is not, let us come to the existing models!

1. Introduction
The IS-PC-MR model

(Carlin/Soskice 2005, 5)

(Dynamic Stochastic General Equilibrium / New Neoclassical Synthesis)

Endogenous money?
Inter-temporal optimization
= no defaults!

Saving-investment imbalances?
S=I!
The IS-LM(-BP) model

Endogenous money?
*Central bank controls monetary aggregate (except liquidity trap)*

Saving-investment imbalances?
*I=S!*

2. IS/LM and IS/PC/MR models
The IS-MY model

endogenous money (MY)
+ (income-expenditure) real economy
+ savings-investment imbalances (IS)

Goal:

Simple analytical tool to explain the monetary problems of an economy (in a currency union, in this case).
endogenous money (MY)

Figure 4: The Money/Income relation (M/Y)

\[ Y = \frac{M \times V}{P}, \quad 0 < m < 1 \]  

Topsy-turvy quantity equation: changes in AD drive Y, which then drives M (given P and V)!
(income-expenditure) real economy

Aggregate demand drives income, in a simple standard income-expenditure model. Note that the current account is part of aggregate demand.
A rise in aggregate demand leads to savings<investment since imports increase. The position of the $S_p$-I curve depends on $(G-T)$.
Expectations in the real economy (I) determine the amount of loans (II) demanded by the private sector to finance parts of aggregate demand (III). Net savings (IV) are the result of behavior in the economy.
Expectations in the real economy (I) drive the amount of loans up (II) as more aggregate demand is financed by debt (III). Net savings (IV) are falling as a result of the rise in imports and decline of the current account.
Expectations in the financial part of the economy drive savings up (I) and aggregate demand – incl. investment – down (II). Income falls (III) and (foreign) loans are repaid (IV).
Figure 7: A rise in government spending

Government spending increases aggregate demand (I) and therefore income (II). High-powered money increases. Private net savings rise (III). No change in trade (IV).
European Monetary Union (EMU)

* A critical look at the first years*

Without any tools to directly influence the level of aggregate demand – monetary, fiscal and exchange rate – the countries could follow three paths to bring up aggregate demand:

1) Private sector lending increases

2) Public sector lending increases

3) External demand increases

Different countries went along different paths, as we know.
Domestically financed real estate bubbles drove the real economy as more and more households went into debt to buy houses with prices ever-increasing: **Spain, Ireland**.
Spain 1999-2007: Investment > Saving, G=T, net imports
Ireland 1999-2007: Saving > Investment, G=T, net exports
Nota bene: Irish household debt increased, so if the private sector net saves it must be the firms, right?
While GNP measures the output generated by a country's enterprises (whether physically located domestically or abroad) GDP measures the total output produced within a country's borders - whether produced by that country's own local firms or by foreign firms.
Relative prices are deflated by letting wages grow slower than productivity (I). Loan demand is weak, whereas exports increase because either …
...they are very competitive (III) and the trade partners finance them by moving into debt (IV) OR capital flows out of the country (IV) and finances imports elsewhere (III).
However that is, weak growth rates resulted in the German economy from 2002-2005. Demand was propped up by an increase in government spending during these times.
Complications

If one country has private sector net savings and is a net exporter, some other country is forced into a position of a net importer with either public or private sector (or both) moving into debt. Or vice versa, which however is unlikely.

Some strategies are ruled out, like all countries increasing (net) exports and no countries increasing imports!

Last but not least, let us have a look at how austerity ($T>G$) will affect the EMU economies according to the model...
Government spending falls, (relative) prices fall, imports decline as GDP shrinks and exports increase. However, the private sector now cannot decrease debt: \( S = I \)

Rebalancing, scenario I: weak export demand

\[ I = S \]

\[ I < S \]

\[ I > S \]

\[ P/P^* = M/L \]

\[ 45^\circ: y = 4D \]

\[ C + I + G + X \]

\[ M + X \]

\[ 0 \]

\[ I \]

\[ S \]

\[ I \]

\[ 45^\circ \]

\[ y = 4D \]

\[ M + X \]

\[ C + I + G \]

\[ S \]

\[ I \]

\[ 45^\circ \]

\[ y = 4D \]

\[ M + X \]

\[ C + I + G \]

\[ S \]

\[ I \]

\[ 45^\circ \]

\[ y = 4D \]

\[ M + X \]

\[ C + I + G \]

\[ S \]

\[ I \]

\[ 45^\circ \]

\[ y = 4D \]

\[ M + X \]

\[ C + I + G \]

\[ S \]

\[ I \]

\[ 45^\circ \]

\[ y = 4D \]

\[ M + X \]

\[ C + I + G \]

\[ S \]

\[ I \]
If only exports would increase faster, than the situation would allow the private sector to repair its balance sheet and would lead to $S_p > I$, which is badly needed.
Conclusion:

The IS/MY model …

… can be driven by the financial or real side
… is driven by aggregate demand in part financed by
… endogenous money (and exogenous money)
… shows how deficit spending works
… highlights the importance of debt (stocks)
… can explain a capital account-driven economy and a
  current account-driven economy
… shows interconnected economies and their strategies
… can account for exogenous changes in price level

* not shown in the slides but in the paper.
Conclusion:

The IS/MY model …

…is all you need to explain many different ideas about what caused the financial crisis and its balance sheet character allows you to rigidly examine policy ideas given a certain environment. Economies must be understood in the context of their neighbors, with which they are interdependent!

The model predicts that austerity in times of general lack of demand will fail, while in good times it might work. Each financial crisis is different, and not all policies work all of the time.
Thank you for your attention.