

Ehnts, Dirk

Working Paper

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

Working Paper, No. 16/2012

Provided in Cooperation with:

Berlin Institute for International Political Economy (IPE), Berlin School of Economics and Law

Suggested Citation: Ehnts, Dirk (2012) : A simple model of a currency union with endogenous money and saving-investment imbalances, Working Paper, No. 16/2012, Hochschule für Wirtschaft und Recht Berlin, Institute for International Political Economy (IPE), Berlin

This Version is available at:

<https://hdl.handle.net/10419/68474>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Institute for International Political Economy Berlin

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

Author: Dirk Ehnts

Working Paper, No. 16/2012

Editors:

Sigrid Betzelt ■ Trevor Evans ■ Eckhard Hein ■ Hansjörg Herr ■
Martin Kronauer ■ Birgit Mahnkopf ■ Achim Truger

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

Dirk Ehnts*

Abstract: The economic crisis in the euro zone proves that neither the creators of the euro nor today's policy-makers fully understand the functioning of a currency union. Explanations of the macroeconomic relations inside a currency union are therefore in demand. It is now clear that macroeconomic imbalances and debt levels should be part of a model. Traditional textbook models, like the IS-LM-BP or the IS-MR-PC models, respectively, are found lacking on the monetary or the real side or both. The one developed in the following has been created with the purpose of filling this gap and allowing the macroeconomic analysis of a currency union with the help of a simple model featuring endogenous money and saving-investment imbalances.

Keywords: endogenous money, saving-investment imbalances, EMU

JEL classification: E12, F41

Author information:

Dr. Dirk H. Ehnts
Berlin School of Economics and Law
Badensche Straße 50-51
10825 Berlin
Germany
e-mail: dirk@hwr-berlin.de

* I would like to thank Eckhard Hein, Jan Priewe, Marc Lavoie, Josef Mensik, Ronny Mazzocchi and the participants of the Hyman P. Minsky Summer Seminar 2012 for giving valuable comments and advice.

1. Introduction

The European Monetary Union (EMU) has been the biggest experiment in monetary economics in recent European history. Being largely a political project led by Jacques Delors, academic economists have been commenting from the sidelines since the foundations were laid in the late 1980s.¹ The theory of optimum currency areas started by Mundell (1961) was revisited by academia and applied to Western Europe. American and European economists soon were in disagreement over the proposed currency union, with the Americans declaring that it would not work and the Europeans strongly believing that it would.² The project was pushed ahead nevertheless, creating the euro. Exchange rates were fixed in 1999 and three years later the euro was put into circulation. Not all countries entered the EMU. Some EU members, having established a broad political consensus, preferred to not join the EMU.³

Three institutions were created to support the EMU. The Maastricht criteria were drafted to determine eligibility for the euro. For those that were admitted to the euro, the main institution is the European Central Bank (ECB). It sets a short-term interest rate for the whole currency union in order to achieve its target of an inflation rate of below, but close to 2 percent over the medium term. This range is the ECB's interpretation of price stability and not hardwired into its legal foundations. The ECB might follow secondary goals as long as price stability is not compromised. Next to the ECB the Stability and Growth Pact (SGP) was established to ensure that governments would not free-ride by moving budgets into deficit in expectation of future bail-outs. The so-called 3/60 rule was established to ensure that government budget deficits would neither surpass three percent of GDP per year nor that total government debt would rise above sixty percent of GDP. The rules were changed in 2005. Two additional reforms were enacted in the middle of the economic crisis: the Euro Plus Pact (2011) and the European Fiscal Compact (2012).

It was clear what was being regulated – the inflation rate and public sector debt – and it was also clear what was not: private sector debt and the balance of payments (BoP). Banking sector regulations were not harmonized on a European level. This meant that private sector debt could expand in one part of EMU while it contracted in another, just as before the

¹ The basic framework is developed in European Commission (EC) (1989), nicknamed the Delors Report.

² See Jonung and Drea (2009) for a perhaps premature summary.

³ See British economists Godley (1992) and Walters (1990) on the prospects of euro membership for Great Britain.

introduction of the euro. Since countries were in different phases of the business cycle, lending increased strongly in some and stagnated in others. As a consequence, those countries that were in the middle of a boom saw wages and prices increase more than those that were in a slump. If national price levels evolved in different directions, you would expect intra-euro zone current account imbalances. Since the ECB exclusively aims at stable inflation in the whole currency union, this situation would be allowed to persist. It was also assumed that asymmetric shocks are unlikely, and that market adjustment would correct these shocks if they happened. Markets would also regulate themselves so that intra-EMU capital flows would not create unsustainable balance of payments positions by themselves.⁴

Right from the start of the EMU domestic credit expanded rather quickly in some countries while it was stable in others. The European Commission (2009, 26) examined the resulting current account imbalances. It is worthwhile to present a full quote:

“According to conventional wisdom, external factors such as price competitiveness are seen as major drivers of current accounts. However, 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. Stronger relative demand pressure in a Member State will tend to fuel import demand and depress the current account.”

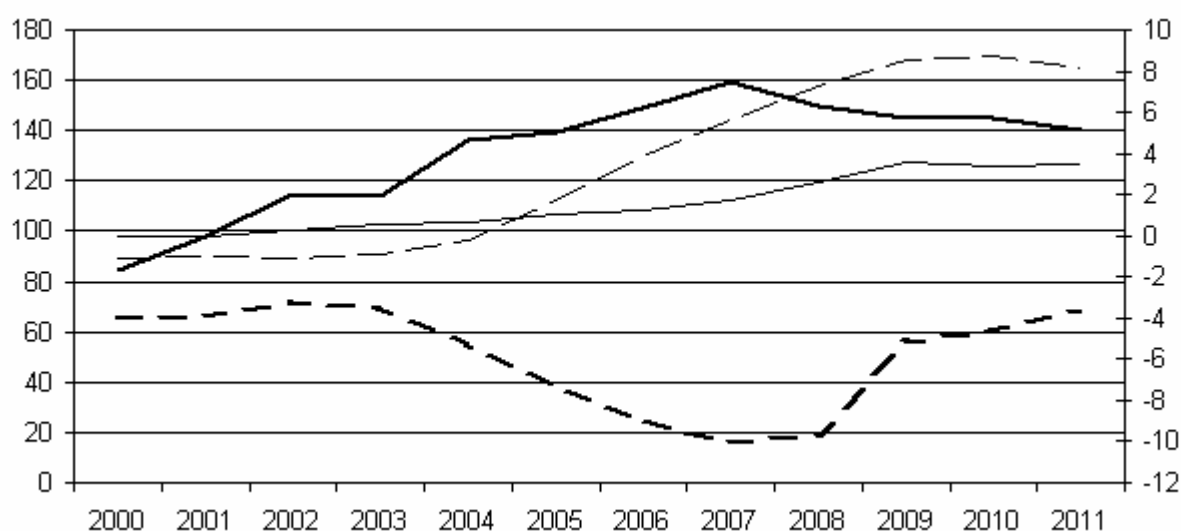
Figure 1 shows the development of the macroeconomic imbalances in Spain and Germany, which are exemplary of the euro zone developments. Germany (dashed line, left hand axis) started with a negative current account in 2000 which turned first positive and then very positive over time until the crisis hit in 2008. In Spain (dotted line, left hand axis), the current account was negative from the start and declined until the crisis broke out. The ratio of the monetary aggregate domestic loans to GDP in Germany divided by that of Spain is depicted by the grey line (right hand axis).⁵ Germany's ratio of domestic loans to GDP used to be significantly higher than Spain's, and only around 2004 did the Spanish domestic loans to

⁴ See Patterson and Amati (1998) for an optimistic evaluation on how shocks can be dealt with by market adjustment(s).

⁵ There are no more collections of national data on monetary aggregates by Eurostat. The data series used is domestic credit as collected by the World Bank.

GDP ratio started to increase. This coincides with the decline of the current account. Today, the Spanish ratio is still much higher than Germany's.⁶

Figure 1: Spanish (black) and German (grey) current account to GDP ratios (dashed, right scale) and domestic loans to GDP ratios (left scale) in percent, source: World Bank (2012a, 2012b)



As it stands, there is no macroeconomic model for a currency union that features macroeconomic imbalances. While there is an extensive literature on optimum currency areas, it is mostly eclectic and to this day has not produced a model of how the macroeconomy of members of a currency union works. Existing models, like the textbook IS-LM model, its open economy extension (Mundell-Fleming model) and DSGE models in the spirit of Woodford (2003) fall short for different reasons explained in some detail later. The world economy has changed a lot in the last decades, and these changes are not yet reflected in the standard models. The following simple model incorporates some recent advances in understanding the workings of a modern monetary economy in the context of a currency union. What I believe these advances to be I will describe in the next section, at the end of which I discuss how these issues are neglected in the Mundell-Fleming model and the DSGE models. After that, a simple macroeconomic model is build that features savings-investment imbalances and endogenous money, among other things. A two country case is examined. The following sections will then examine equilibria and policy in such a macroeconomic framework, followed by a conclusion.

⁶ Domestic loans in Spain would be much lower had the ECB not started accepting mortgage-backed assets in their liquidity provision operations from early on. Non-performing loans would have been written of by now.

2. Literature

A macroeconomic model of a currency union must be able to explain what drives the economies of its members. As the European Commission (2009) has emphasized, macroeconomic imbalances play a major role. If that is the case, then stocks of debt matter. This means that money cannot be treated as a veil. Money – or credit – must be modelled explicitly. The inter-regional as well as the inter-sectoral distribution of debt as well as the level of gross debt do influence the economy. In other words, money is not neutral.

This was recognized about eight decades ago by John Maynard Keynes, who looked for a theory which would deal 'with an economy in which money plays a role of its own and affects motives and decisions' (1933, 408). In 'The General Theory of Employment, Interest and Money' Keynes introduces money stocks into the flow framework. Current investment depends on the marginal efficiency of capital, which is influenced by expectations about future earnings and 'the reward for parting with liquidity' as described by Keynes (1936, 167), expressed through the interest rate. In the IS-LM model, it is the downward movement of the investment schedule that leads to an equilibrium with underemployment, as savings adjust to investment through changes in income. However, the model is not without flaws regarding the situation of stocks and flows.⁷

Keynesian theory was extended by Hyman Minsky, who looked more explicitly at the financial side of the economy. According to Minsky (1982, 6), aggregate demand is equal to income plus the change in debt. What is meant here is the change in endogenous money with an increase in lending not being set off one to one instantly by an increase in savings. The increase in lending will lead to higher incomes that will create an increase in savings later on. Debt and demand are intertwined as parts of demand -- consumption, investment, government spending and net exports -- are financed by an increase in indebtedness of the respective sector. This complicates economic analysis. Stock-flow consistent models are able to handle this complication only at the price of additional complexity.⁸ Having established that stocks of debt matter for the economy, the next question is how.

⁷ While the I-S curve describes a flow equilibrium, the L-M curve describes a stock equilibrium.

⁸ See Godley and Lavoie (2007) and van Treeck (2009) among others.

Lavoie (1985, 67-68) states:

“[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). Credits are created *ex nihilo*. The recipient of the purchasing power is the initial recipient of the loan. When the bank makes a new loan, the borrower is being immediately credited with a deposit, the amount of which is exactly equal to the amount of the loan. Hence, the increase in the supply of money is a consequence of increased loan expenditure, not a cause of it. The loan is the causal factor.”

Given optimistic expectations, firms will be willing to increase debt finance. Minsky (1982, 24) divides debt finance into three types. The healthiest of these is hedge finance, when an investor borrows today in order to repay the loan plus interest in the future. The next step is speculative finance, when an investor can only repay the interest on his loan but not the principal. Beyond that, Ponzi finance describes investors that can repay neither interest nor principal. The last two types are dependent on financial markets to roll over their existing loans from time to time. When firms forget the lessons of the past, more and more firms might shift towards the two risky classes of external finance and financial fragility increases.

Richard Koo (2003) coins the term *balance sheet recession* to describe the change of behaviour in the private sector when balance sheets start to look more and more fragile. As investors turn towards a more pessimistic view of less growth and higher interest rates, they change from profit-maximizing to debt-minimizing behaviour. This has an influence on asset prices as firms start repaying their external debt by selling some assets, often being forced to. The fall in loans causes a fall in asset prices, as in the early 1990s in Japan and in 2008-09 in both the US and Europe.⁹ Cash flows no longer finance investment but reduce the total amount of debt, as loans are repaid and balance sheets shrink. Meanwhile, the real economy is in trouble because first investment and then consumption fall.

Fisher (1933) describes the process of debt deflation in times of financial distress. Written in the aftermath of the Great Crash of 1929 and in the middle of the Great Depression, Fisher shows that the repayment of debt by private firms sets into motion a deflationary process

⁹ Only government intervention – Troubled Asset Relief Program (TARP), quantitative easing (QE), long-term refinancing operation (LTRO), etc. – stopped the decline in asset prices.

which feeds back on their real debt load and might not come to a halt on its own. Policy intervention might be necessary to stabilize prices and stop the downward spiral.¹⁰

Another very important issue concerns the origin and form of money. Whereas in the IS-LM model the central bank exogenously sets the monetary supply, most central banks today set some short-term interest rates. The monetary aggregate is then completely determined by the demand for loans, as shown by Hein and Stockhammer (2011, 115). Given the interest rate, banks can lend to creditworthy borrowers and private sector entities can borrow given they are not stopped by regulation.¹¹ Hence loan supply is determined by loan demand. It is therefore the expectations of investors in the real economy and those of speculators that in normal times determine the monetary aggregate, and not the central bank.¹² This constitutes a large difference. In a currency union, it is impossible that the monetary aggregate of each and every member is controlled by the single central bank.¹³

Most of the building blocks above are not part of existing models. The IS-LM-BP model assumes exogenous money, which is controlled by the central bank. Furthermore, interest parity is assumed to hold, which does not allow for persistent capital market mistakes. In the case of fixed exchange rates, monetary expansion puts the exchange rate under pressure to depreciate. The central bank would have to intervene by buying foreign assets with domestic money, thus stabilizing the currency but reversing the monetary expansion. In a currency union, this works out quite differently.

Modern neo-classical models like those of the DSGE variety based on Woodford (2003) do not model credit realistically. Neither distribution nor levels of debt play a role. Inter-temporal coordination failures on the capital markets, as seen for instance in the US, Ireland and Spain in the last 5 years, are ruled out by the use of an inter-temporal optimization approach which produces one equilibrium. Declaring investment to be equal to savings at all times blocks the view on macroeconomic imbalances just as the neglect of the external sector.¹⁴ Also, the use of the interest rate as the major mechanism to establish equilibrium is

¹⁰ A variation on this theme is offered in Bernanke and Blinder (1988).

¹¹ Reserve ratios are one possible way to curb lending, limiting the choice of assets available as collateral for repo are another. There are many more possibilities which largely depend on the way the financial sector and the central bank are set up.

¹² The central bank can influence only some monetary aggregate through policies like quantitative easing, buying illiquid debt with liquid funds.

¹³ Even with capital controls money and credit are endogenous.

¹⁴ See Mazzocchi et al. (2009) for a more complete critique.

not helpful in a currency union where economies that face the same interest rate nevertheless are at different points of the business cycle.

In the following, the endogenous money and saving-investment imbalances are incorporated into one single framework. The goal is to show how changes in (expected) aggregate demand influence endogenous money and sectoral debt and through this drive the economy of currency union members.¹⁵ It is during times where credit constraints become binding that the economy experiences stress.

3. The IS-MY model

The following model presents a view of an economy which is part of a currency union. The central bank controls the short-term interest rate, which is the same for all members. Therefore, the development of the monetary aggregate is more interesting. It is defined as the sum of all loans created in an economy. The creation of loans takes place when banks that are willing and able to finance find households or firms that are willing and able to borrow.¹⁶ Loan demand comes from government, consumers, entrepreneurs but also from speculators.¹⁷ Consumers borrow in the form of residential real estate mortgages, home equity loans, student loans and the like.¹⁸

The main economic problem in any economy is establishing the equality of supply and demand at a level that maximizes social welfare. In the words of Axel Leijonhufvud (1981, 104):

“[T]he central issue in macroeconomic theory is – once again – the extent to which the economy, or at least its market sectors, may properly be regarded as a self-regulating system. In what respect does it, or does it not, behave in such fashion? How well, or badly, do its ‘automatic’ mechanisms perform?”

¹⁵ The model can be applied to economies outside of currency unions as well.

¹⁶ The creation of loans by banks is not regulated by the central bank in the sense that the latter always supplies the necessary reserves – given that they are demanded by creditworthy institutions – at the interest rate it has set.

¹⁷ The way governments in the EMU are financed by banks is specific to the construction of the monetary system. Most other industrial economies have chosen a different system whereby sovereign debt is a risk-less asset as a consequence of setting up the central bank as a lender of last resort.

¹⁸ Whether these constitute investment or consumption is a matter of debate.

In the following model, demand is connected to the financial side of the economy through changes in (net) debt. It is assumed that insufficient demand in the real part of the economy is the major problem.¹⁹ However, the model can also be set into a full employment mode. Therefore, it is a general theory of the economy rather than a special case.

In the following it is assumed that the price level is fixed exogenously. There are only two countries which regarding the balance of payments are not independent of each other. Since these two countries are members of a currency union, it follows that the nominal exchange rate is fixed. The same goes for the nominal interest rate, which is set exogenously. Assuming that the price level is fixed as well, the real interest rates and the real exchange rate are also constant.

In the goods market, income Y equals aggregate demand AD .

$$AD = Y \quad (1)$$

Aggregate demand consists of domestic demand (consumption C , investment I and government spending G) to which exports EX are added to and imports IM subtracted from.

$$AD = C + I + G + (EX - IM) \quad (2)$$

Consumption includes an autonomous part c_0 that does not depend on income and a part that directly depends on it. The propensity to consume c lies between zero and one.

$$C = c_0 + c*Y, 0 < c < 1 \quad (3)$$

Investment is exogenous, since it depends on expectations about future levels of demand and conditions in the financial markets which are not modelled.²⁰

$$I = \bar{I} \quad (4)$$

Government spending is also set exogenously.

¹⁹ See Eiteman and Guthrie (1952, 834-5).

²⁰ However, some indication about investment could be derived by looking at the real interest rate, aggregate demand and the state of the stocks of debt in the model.

$$G = \overline{G} \quad (5)$$

Imports depend directly on income, with the marginal propensity to import im being positive and below one.²¹

$$IM = im * Y, 0 < im < 1 \quad (6)$$

Exports depend on the foreign marginal propensity to import im^* and the income AD^* of the rest of the world.

$$EX = im^* * AD^* \quad (7)$$

Given these real variables, private savings S_p are equal to investment plus net exports plus government deficit. This identity follows from the balance of payments. A balanced current account and a balanced government budget would leave private savings equal to investment. Private savings increase when net exports rise, the budget deficit increases or investment rises.²²

$$S_p = I + (EX - IM) + (G - T) \quad (8)$$

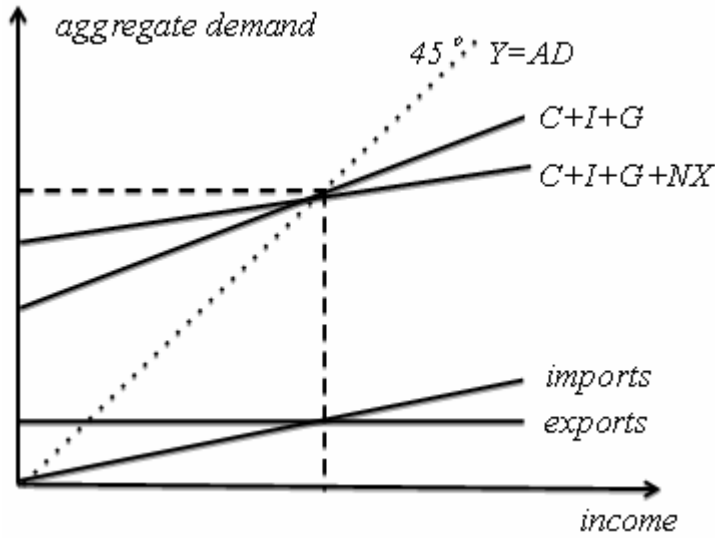
Figure 2 shows the above equations in graphical form.²³ On the 45 degree line income, which is shown on the horizontal axis, is equal to aggregate demand, which is shown on the vertical axis. Domestic demand ($C + I + G$) is upward-sloping because more income will lead to more consumption. More consumption leads to more income, which leads to more consumption, etc. The slope is less than 45 degrees because a part of the rise of income falls on savings.²⁴ Imports rise with income while exports do not. Adding net exports to domestic demand gives us the aggregate demand curve AD .

²¹ Note that this is a critical assumption. Imports depend on relative incomes of domestic and foreign, not on relative price levels. The income effect dominates the substitution effect. This connects to the Keynes-Ohlin debate on the transfer problem.

²² The two terms are in brackets to highlight that they are net exports and the government budget surplus or deficit.

²³ The starting equilibrium resembles an unlikely state with a balanced current account and a balanced government budget. It has been chosen in order to highlight the rise of savings-investment imbalances.

²⁴ A higher income is not spent in full, as part of it is used to increase private savings.

Figure 2: Goods market equilibrium

Having established the relations of the real economy, the focus now shifts to the financial underpinnings of the economy. Net indebtedness can play a major role in the economy. Expenditure is influenced by changes in indebtedness as credit constraints of households, private firms and the government are relaxed or tightened. Equation 9, which is an identity, describes the changes in net indebtedness of the sectors of the economy.

$$(S_p - I) + (T - G) = (EX - IM) \quad (9)$$

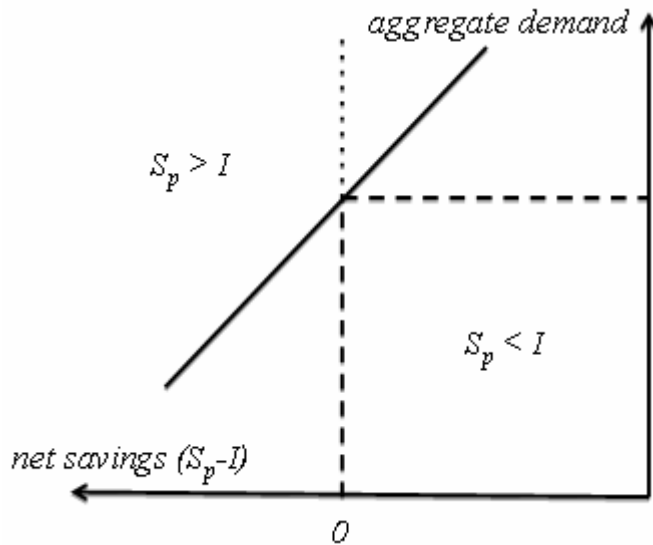
Connecting the real with the financial side and assuming the government budget to be balanced, net imports ($IM > EX$) coincide with an increase in foreign indebtedness ($S_p < I$), while net exports ($EX > IM$) coincide with a decrease in foreign indebtedness ($S_p > I$). Alternatively, holdings of foreign assets might be reduced to finance net imports or foreign assets are accumulated when the current account is positive. Given the demand and net import schedules, a change in private debt ($S_p - I$) is related to the current account ($EX - IM$).²⁵ This can be seen in figure 3.

There is one level of demand at which the current account is balanced. At this level, private savings must be equal to investment. This situation is shown by the dotted lines. If demand would move higher, in conjunction with an increase in loans, imports would increase over

²⁵ See equation 9.

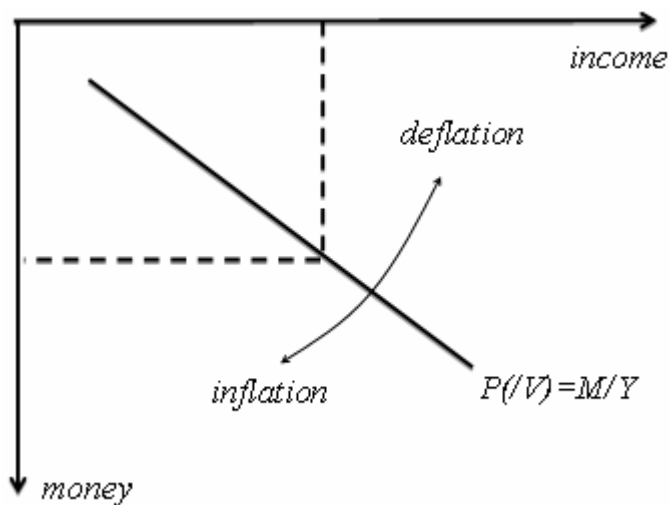
exports and private savings will be lower than investment.²⁶ In the opposite case private savings would rise over investment, generating an increase in private sector wealth.

Figure 3: The Saving-Investment relation (S_p-I)



The model describes savings-investment imbalances as the ultimate result of changes in the amount of credit in the economy. The causality runs through the goods market where an increase in aggregate demand is financed by a rise in the amount of loans and hence income rises. This increase is partly spent on imports, which drives the current account down. Figure 4 is showing this link.

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



²⁶ Some financial assets that were considered to be private sector wealth have been spent on imports, thus leading to private sector dissaving.

Given that prices are fixed, a fall (rise) in the demand for loans will lead to a fall (rise) in income. This reasoning is close to that of the quantity equation. However, here it is the change in the amount of loans that drives income, given some price level:

$$Y = \frac{M * V}{P} \quad (10)$$

Assuming that the price level P and the velocity V of money (or credit) are fixed, the amount of money (or loans) M and income Y move in tandem. They are positively correlated. The MY line in figure 4 shows that correlation.²⁷ However, that correlation may break down at one point as the price level cannot remain constant under all conditions. Under full employment or conditions where bottlenecks exist in either labour or input markets it is quite likely that a debt-financed increase in demand will lead to an increase in the general price level as firms are bidding up certain prices. As a result, the MY line would turn downwards (upwards) in the case of inflation (deflation). This has a feedback on the level of exports that are connected to each level of income and on private savings which depend on real debt. On the other hand, changes in the wage level can drive the price level. The evolution of unit labour costs thus can shift the price level in Figure 4 and by this change the relationship between changes in loans and changes in income.

Combinations of some price level movement and some increase in incomes are possible by shifting the MY line around. The model therefore can take account of an economy's specific conditions regarding the scarcity of factors of production, the politics of distribution or the changes in unit labour costs. Therefore, there is no assumption of a short- or medium-run Phillips curve.²⁸ In the following we assume that the price level is fixed exogenously. Last but not least, note that the price level does not include prices of financial assets.

Money is a catchall for both money created by the banking sector extending loans to finance consumption or investment and money created by the interplay of central bank and government or banks and government.²⁹ Assuming that a government engages in deficit spending by having its sovereign bonds discounted at the central bank this would increase the

²⁷ Hence the name IS-MY model.

²⁸ Introducing such an assumption would not be impossible, however.

²⁹ This depends on the details of the institutional setup.

amount of money. The same would happen if banks borrow money from the central bank and then proceed to invest the funds into government bonds.

4. Equilibria and Business Cycles

Putting the parts together, two impulses can drive the economy. During a boom an improvement in expectations leads to an increase in aggregate demand, leading to an increase in income. The economic expansion is mirrored in the expansion of balance sheets of the private sector. In consequence, more investment (or consumption) is financed by the additional creation of endogenous money as the acceptance of higher debt levels and ceilings permeates society. The increase in aggregate demand – either via households increasing their consumption or firms increasing their investments or both – increases total output and therefore income, which then leads to a subsequent rise in savings.

The private sector may increase external debt when it perceives a rise of existing wealth, a brighter future due to (expected) technological improvements, or a rise in the schedule of marginal efficiency of capital. All of the above can leave them with more collateral, depending on accounting rules. This additional collateral might be pledged to tap new funds if the central bank is willing to accept it. In the beginning, loans are taken out in order to invest and then repay the loan with the profits made.

Eventually, speculative and Ponzi financing becomes more widespread. Following Minsky's (1975, 1982, 1986, 1992) classification, firms using speculative finance repay interest but not principal and those using Ponzi finance can repay neither. The rise in indebtedness increases the demand for liquidity as more interest payments must be made, which at some point – perhaps when the perceived risk premium rises – translates into higher interest rates. Alternatively, a rise in the inflation rate can result from more and more debt-financed aggregate demand driving up prices of scarce production factors.

Be that as it may, when financial distress becomes large enough, households and companies start repaying external debt. As a result, the monetary aggregate shrinks. Private savings increases over investment, but only because of the current account surplus that comes about as a result of the fall in incomes. Firms have changed their mode from profit-maximizing to

debt-minimizing. If households had increased their debt they might now reduce consumption in order to decrease their liabilities.³⁰

Figure 5: The IS-MY model, equilibrium

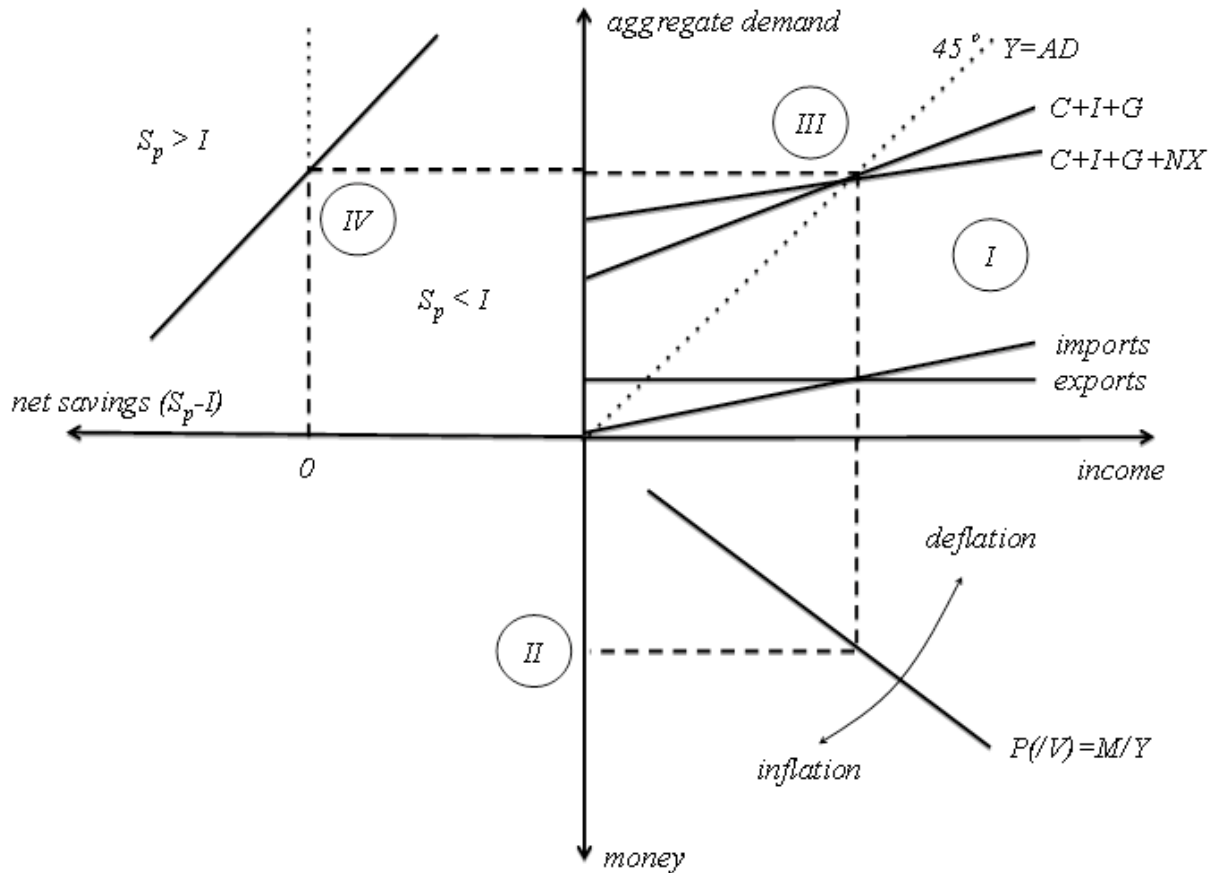


Figure 5 shows how the parts fit together. In this scenario, it is assumed that the debt levels are no problem and the economy is driven by the real side. Expectations drive the demand for loans by entrepreneurs and speculators (I), who are subsequently supplied with funds by the banking sector (II). The latter will supply those funds given that the regulation is no constraint and debtors have acceptable collateral. The creation of endogenous money which finances additional investment and/or consumption adds to aggregate demand, which then increases total income.

In the real economy income is equal to demand. In equilibrium the current account is assumed to be exactly balanced, as imports match exports and we have assumed that the government

³⁰ This can cause firms to accumulate unexpected inventories which need to be financed. The private sector as a whole would not be able to repay debt. In the model it only does so since the current account improves.

budget is balanced.³¹ This is mapped into the north-western sector where private savings are equal to investment (IV). This is a result of the BoP accounting identity from equation 9 in conjunction with the additional assumption of a balanced government budget.

Figure 6: The IS-MY model, driven by more pessimism

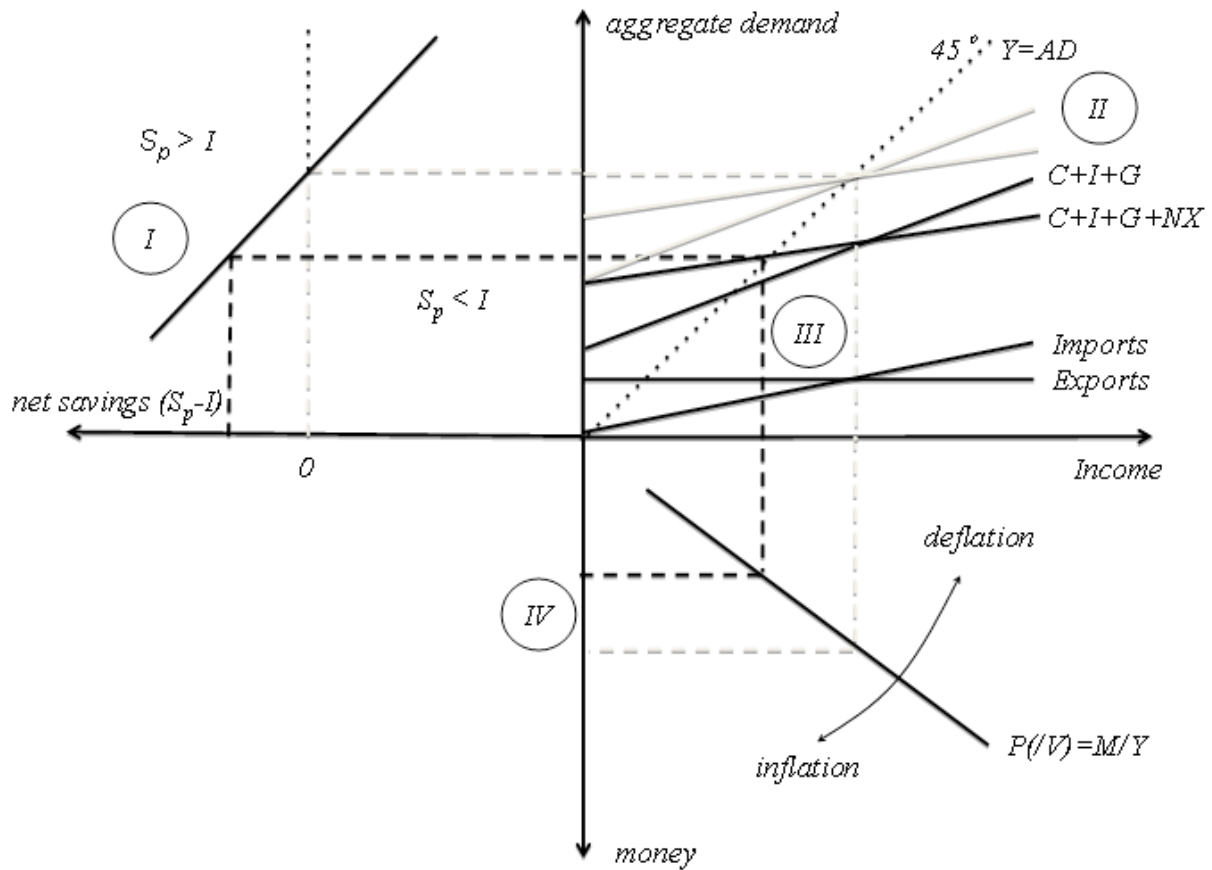


Figure 6 shows the situation of an economy driven by debt problems.³² Now, the private sector is assumed to be in a position of reducing its liabilities because of some perceived sectoral indebtedness constraint.³³ Levels of (foreign) debt are judged to be too high, and therefore private savings are moving up. This increase in private savings means that demand must be falling, starting a multiplier process resulting in falling income (II). As a result, aggregate demand falls, which pulls down actual output. A fall in income depresses imports, in this case so much so that the current account turns from balanced to positive (III). As firms are repaying loans, the amount of money in the economy falls and private savings ends up being higher than investment as a mirror image of the current account surplus. This is broadly

³¹ This arbitrary assumption can be changed without problems.

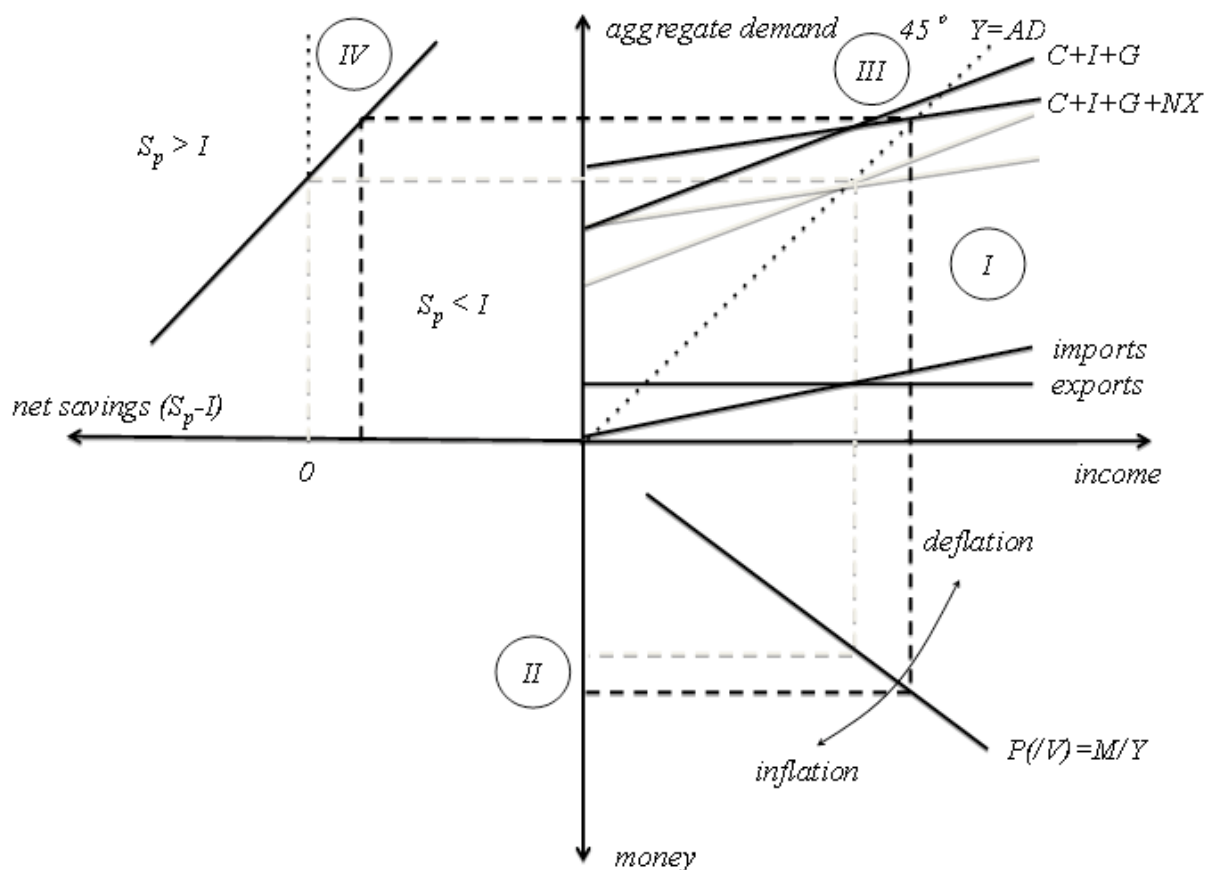
³² This is a theme prominently developed by Richard Koo (2009).

³³ Public and external sector might also react to perceived or hard sectoral indebtedness constraints. At the end of 2012, the so-called 'fiscal cliff' in the US is still a hard public indebtedness constraint but might soon be removed.

the situation Germany was in after the bust of the dot-com bubble in 2001. As the private sector is trying to accumulate savings and reduce debt, demand is weak and so is the economy if left to itself.

Other countries – like Spain – rely on closing the demand gap with domestic demand – willingly or not. Remembering that capital outflows of one country are the capital inflows of another, external forces might push countries into a certain direction. Figure 7 tells their story. As people in the real economy are quite optimistic about future demand (I), households and/or firms demand more loans (II) to finance additional aggregate demand. Income expands and therefore the economy grows (III). The rise in imports is financed by an increase in foreign debt, and private savings thus fall below the level of investment (IV).

Figure 7: The IS-MY model, driven by more optimism



In the following, the two stylized economies of Spain and Germany will be examined from a policy perspective. How can countries react to problems of high (low) demand or a sustained negative (positive) current account? What are the consequences of economic policies for the other country, assuming that there are only two countries?

5. Economic Policy

Business cycles are part of every capitalist economy. In good times, demand is stronger than supply, whereas in bad times demand is weaker than supply. Market forces should ensure that supply and demand are in equilibrium, but recent mass unemployment in both Greece and Spain shows that the adjustment process – if it works at all – takes too much time. There are economic policy tools available that allow expanding or contracting both domestic and foreign demand.

However, the economies in a currency union have given up the conventional instruments of economic policy that most sovereign nations have available. There is no longer a nominal exchange rate. The price level depends partly on wage setting, which can be influenced through policy. Therefore, the real exchange rate can be influenced exclusively through changes in the nominal price level. Monetary policy is not available because it is now run at the supranational central bank. Last but not least, use of fiscal policy might be limited under certain conditions.³⁴ Financing government deficits through the central bank is not an available option if the rules do not admit it. Macroeconomic adjustment – equalization of demand and supply on the goods market – rests on markets getting it right, because in case of problems there are not that many powerful instruments left.³⁵

As noted above, a shortfall in demand is the most serious problem of short-run macroeconomic policy. Three routes are available to increase demand in an economy which is part of a currency union. A first route leads to an expansion of aggregate demand via the facilitation of an expansion of loans to the private sector, for example by lowering the standards for creditworthiness or public guarantees for private debt. A rise in indebtedness can finance consumption and/or investment, which are both part of aggregate demand. A part will leak to imports, but nevertheless a rise in private sector indebtedness for spending purposes will increase domestic demand. We have seen this scenario above in Figure 7. A second road to expand demand is to export more and as a matter of accounting for the private sector to save more than invest.³⁶ While wages are cut in order to become more competitive

³⁴ A case in point would be the Stability and Growth pact in the euro zone.

³⁵ There are, of course, still the automatic stabilizers.

³⁶ The direction of causation is much debated. Sometimes the capital account drives the current account, sometimes it is the opposite.

demand might be lacking. When this condition persists demand can be propped up by deficit spending as long as this is allowed, which is the third strategy. In order to rebalance the economies an expansion of government spending in Germany and a fall in the price level of Spain through cuts in nominal wages are the two options that will be discussed in the following.³⁷

Figure 8: The IS-MY model, a rise in government spending

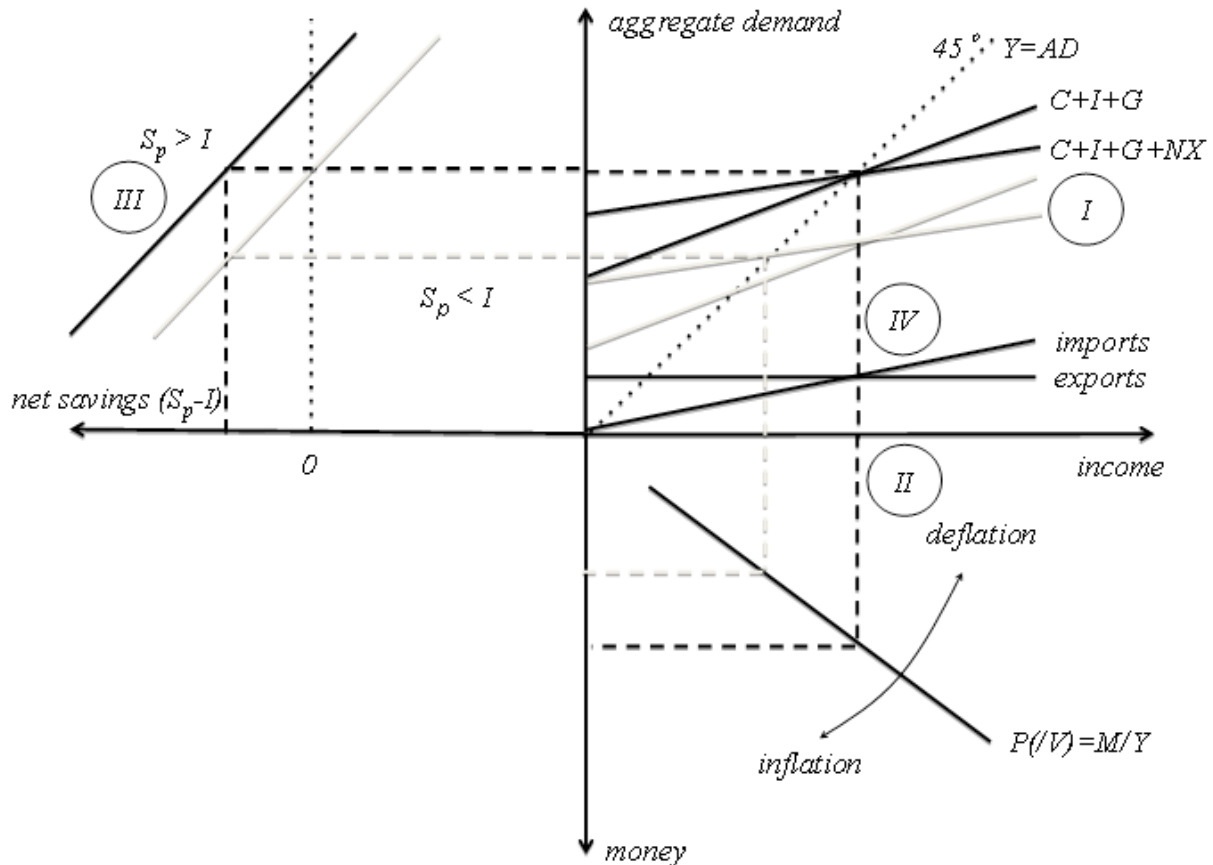
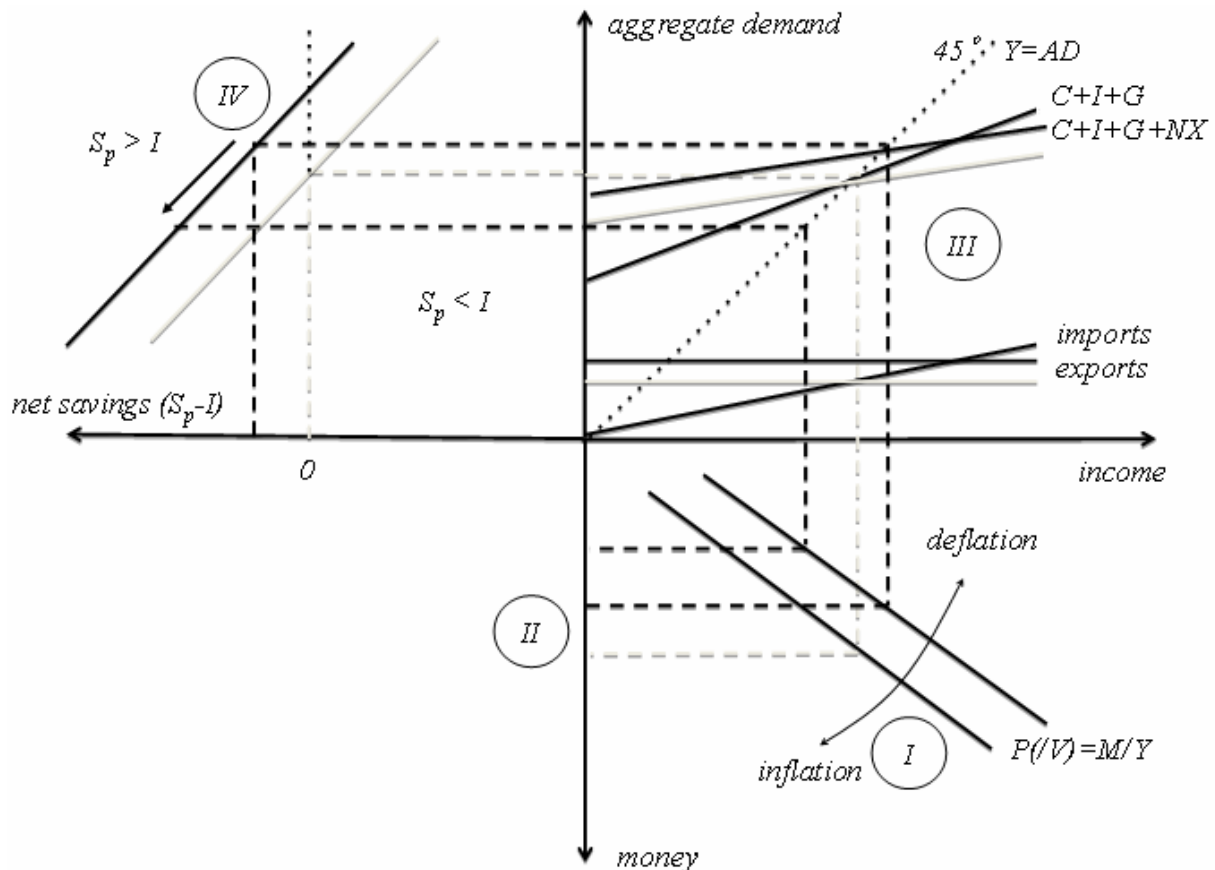


Figure 8 shows a rise in government spending in Germany. The grey lines show the equilibrium before government spending increases. The private sector was in a net saver position as a fall in demand led to a current account surplus. The problem is that the economy is in a situation of low income. The rise in government spending (quadrant I) should bring income back up. It is financed by an increase in the monetary aggregate (II). The rise in government spending enables the private sector to save more, so that the S-I line shifts outwards (III). However, the rise in imports means that the trade surplus is reduced. This would be beneficial to Spain, since in the two country case imports of Germany are exports of Spain.

³⁷ An increase in loan demand from the private sector in either country would also increase GDP. See Figure 7.

Now we come to the alternative strategy. Figure 9 shows a fall in the price level. This brings about an increase in net exports which can come about in two different ways, depending on whether the current or the capital account is dominating. If the capital account dominates, the argument would go something like this: the exogenous price level has shifted downwards (I).³⁸ Assuming a central bank that reacts to weakness in total aggregate demand by lowering the interest rate, loan demand in the other country will increase which then increases foreign aggregate demand. Since a part of that falls on imports, exports of the net lending economy rise (III). This creates a rise in net savings in the private sector (IV).³⁹ However, the fallen price level increases real debts, and the private sector might react by increasing savings (see arrow). This will force aggregate demand down and reduces imports, which allows the private sector to increase its savings at the cost of falling GDP.

Figure 9: The IS-MY model, a fall in the price level



³⁸ This might have caused the capital outflow in the first place via a decrease in the real interest rate. However, as it stands the price level is still exogenous.

³⁹ Note that the share of foreign assets in the portfolio of financial assets increases.

If the current account drives the capital account the direction of causality is reversed. The exogenous fall in the price level relative to that of the foreign country (I) causes a decrease in lending (II), just as before. However, it also causes a rise in exports (III) which then leads to a rise of private net saving (IV). The ISMY model therefore can account for macroeconomics driven by both current account and capital account. In both scenarios – an increase in government spending in Germany and a fall in the price level of Spain – the economies seem to grow as a result of the policies. However, a fall in the price level will increase the real debt burden in the economy and might trigger reactions by the private sector (see arrow in figure 9). If a fall in the price level increases the real debt burden of, say, Spanish households than these might react by trying to save more. The model would then be driven by more pessimism as in figure 6. The resulting fall in demand will over-compensate the positive developments in the current account as long as households are trying to pay down debt. Trying to pay down debt by saving is self-defeating if this causes demand, output and then employment to fall – a fallacy of composition.

Comparing figures 8 and 9, it is clear that these two scenarios are not independent of each other. In the scenario with an increase in net imports, the private sector is reducing its net saving. As a consequence of double-entry bookkeeping, some other – domestic or foreign – sector must be increasing its net saving. This is how the figures must fit together. If one country follows an export-led growth strategy, then the other country's private sector will find it difficult to prevent the increase in net (foreign) debt. In theory, the public sector of either country could be the counter-party. If that constellation is made impossible by fiscal institutions the increase in debt must take place in the foreign country's private sector.⁴⁰

6. Conclusion

The intention of the model developed above was to present a simple framework in which endogenous money permits saving-investment imbalances. The idea was to connect the monetary framework with the balance of payments and therefore show how macroeconomic imbalances play themselves out in a currency union. Using the euro zone as an example, it was shown that the members had limited economic policy options when they joined the

⁴⁰ These observations hold only in the case of two countries. The introduction of one or more countries would complicate the analysis.

currency union and chose different paths. The model highlights the importance of sectoral indebtedness constraints and the distribution of debt for macroeconomic equilibrium.

The IS-MY model is a flow-only model, which does not include any stocks. However, the question whether the existing values of flows that drive the debt position of the private, the public and the external sector are sustainable and under what conditions comes up naturally. The discussion of the adjustment of stocks over any time frame hence leads to questions of the sustainability of government budgets, household and corporate sector as well as external debt.

References

- Bernanke, Ben S. and Alan S. Blinder. 1989. Credit, Money, and Aggregate Demand, *American Economic Review*, 78(2): 435—39
- Eiteman, Wilford J. and Glenn E. Guthrie. 1952. The Shape of the Average Cost Curve. *American Economic Review*, 42(5): 832—838
- European Commission, Committee for the study of economics and monetary union. 1989. Report on Economic and Monetary Union in the European Community
- European Commission, DG ECFIN. 2009. Special Report: Competitiveness Developments within the Euro Area. Quarterly Report on the Euro Area, Vol. 8(1)
- Fisher, Irving. 1933. The Debt-Deflation Theory of Great Depressions. *Econometrica*, 1(4): 337—357
- Godley, Wynne. 1992. Maastricht and All That. *London Review of Books*. 14(19): 3—4
- Godley, Wynne and Marc Lavoie. 2007. Monetary economics: an integrated Approach to Credit, Money, Income, Production and Wealth. Basingstoke, UK: Palgrave Macmillan
- Hein, Eckhard and Engelbert Stockhammer (eds.). 2011. A Modern Guide to Keynesian Macroeconomics and Economic Policies. Cheltenham, UK and Northampton, US: Edward Elgar
- Jonung, Lars and Eoin Drea. 2009. The euro: It can't happen, It's a bad idea, It won't last. US economists on the EMU, 1989-2002. *European Economy - Economic Papers* 395, Directorate General Economic and Monetary Affairs, European Commission
- Keynes, John M. 2007 [1936]. The General Theory of Employment, Interest, and Money. Basingstoke: Palgrave Macmillan.
- Keynes, John M. 1933. A Monetary Theory of Production; in: Clausen, Gustav et al. (eds.) *Der Stand und die naechste Zukunft der Konjunkturforschung. Festschrift für Arthur Spiethoff*. Munich: Duncker and Humblot.
- Koo, Richard. 2003. Balance Sheet Recession: Japan's Struggle with Uncharted Economics and its Global Implications. Singapore: John Wiley and Sons.
- Koo, Richard. 2009. The Holy Grail of Macroeconomics: Lessons from Japan's Great Recession. Revised Edition. Singapore: John Wiley and Sons.
- Lavoie, Marc. 1985. Credit and Money: The Dynamic Circuit, Overdraft Economics, and Post Keynesian Economics, in: Jarsulic, Marc (ed.), *Money and Macro Policy*. Boston: Springer
- Leijonhufvud, Axel. 1981. Information and Coordination. New York: Oxford University Press
- Mazzocchi, Ronny, Roberto Tamborini and Hans-Michael Trautwein. 2009. The Two Triangles: what did Wicksell and Keynes know about Macroeconomics that Modern Economists do not (consider)? Department of Economics Working Papers 0906, University of Trento
- Minsky, Hyman. 1975. John Maynard Keynes. New York: McGraw Hill
- Minsky, Hyman. 1982. Can "It" Happen Again? Armonk: M.E. Sharpe
- Minsky, Hyman. 1986. Stabilizing an Unstable Economy. New Haven: Yale University Press
- Minsky, Hyman. 1992. The Financial Instability Hypothesis. Jerome Levy Economics Institute Working Paper No. 74
- Mundell, Robert A. 1961. A Theory of Optimum Currency Areas. *American Economic Review* 51 (4): 657—665
- Patterson, Ben and Simona Amati. 1998. Adjustment to Asymmetric Shocks. Directorate-General for Research Working Paper 104
- Pettis, Michael. 2001. The Volatility Machine: Emerging Economics and the Threat of Financial Collapse. New York: Oxford University Press

- van Treeck, Till. 2009. A synthetic, stock-flow consistent Macroeconomic Model of 'financialisation', *Cambridge Journal of Economics*, 33(3): 467—493
- Walters, Alan Arthur. 1990. *Sterling in Danger: The Economic Consequences of Pegged Exchange Rates*. London: Fontana/Collins
- Wicksell, Knut. 1898. *Geldzins und Güterpreise*. Jena: Gustav Fischer
- Woodford, Michael. 2003. *Interest and Prices: Foundations of a Theory of Monetary Policy*. Princeton: Princeton University Press
- World Bank. 2012a. World Development Indicators (WDI) & Global Development Finance (GDF). DOI: <http://data.worldbank.org/indicator/BN.CAB.XOKA.GD.ZS>
- World Bank. 2012b. World Development Indicators (WDI) & Global Development Finance (GDF). DOI: <http://data.worldbank.org/indicator/FM.LBL.MQMY.GD.ZS>

Imprint

Editors

Sigrid Betzelt ■ Trevor Evans ■ Eckhard Hein ■ Hansjörg Herr ■
Martin Kronauer ■ Birgit Mahnkopf ■ Achim Truger

ISSN 1869-6406

Printed by
HWR Berlin

Berlin December 2012