Explain/discuss five of the following statements:

1. Inflation rates may differ across the Eurozone, but this is not necessarily a matter of concern.

True, inflation rates may differ across the Eurozone, and this is not of concern if inflation rate differences reflect productivity differences according to Balassa-Samuelson.

With $\dot{p_A} = a\dot{p_{AT}} + (1-a)\dot{w_A}$ and $\dot{p_B} = a\dot{p_{BT}} + (1-a)\dot{w_B}$ and with $\dot{p_{AT}} = \dot{p_{BT}}$ as change in prices of tradeable goods has to be equal, we get $\dot{p_A} - \dot{p_B} = (1-a)(\dot{w_A} - \dot{w_B}) = (1-a)(\dot{q_A} - \dot{q_B})$, where $\dot{q}$ reflect change in productivity. From this we get that differences in inflation can be a due to changes in productivity.

Inflation rates however can also be of concern if this does not reflect productivity. For example, surprise inflation, which is engineered by member state government to `eat debt`, can cause investors to require higher nominal interest rate, thus bringing also union interest rate up. This affects all the members of Eurozone and therefore this is of concern, as other more prudent countries suffer with higher interest rate.

But more importantly, the bigger concern indeed is if inflation rates do not reflect productivity changes, because then it could have detrimental effects on Eurozone and perhaps in EU. With high inflation, average union inflation rate is high, requiring high interest rate for the whole union, which makes capital more costly. This is certainly not a good thing. However, even bigger problem is that if country has long-term high inflation, for example, when massive spending causes increases in price and this in turn pushes workers to requiring higher wages and this is infamous, notorious price-wage inflationary spiral. In such a situation, it is no surprise that people start to revolt and question the usefulness of Eurozone and euro as its national central bank has lost its own monetary policy and cannot devalue the currency to restore its competitiveness. Similar thing has been noted in the history of Eurozone. First, it is no wonder that in Maastricht Treaty, one of the criteria for adoption of euro is that country joining has to have average inflation rate at most 1.5% higher than average inflation rate of the countries with three lowest interest rates. This is mainly because high inflation differences and inflation preference differences make low inflation countries questioning the usefulness of the Eurozone and they lose welfare (due to high-inflation country pushing up aggregates of both union average inflation rate and union interest rate).

Secondly, one could make a case that Greece had this price-wage inflationary spiral prior to the 2008 financial crisis as government spending was super high with Greece`s debt-to-GDP ratio increasing from 99% at the start of the Eurozone to 103% of GDP prior the crisis with running deficits during boom period and people and banks lent cheaply from northern countries. This led to increases in price and wages, thus unit labor requirements increased, worsening its competitiveness. When the financial crisis arrived, Greece had run budget deficit during boom, switching effectively off automatic stabilizers and with worsening competitiveness, Greece fell the hardest and even unemployment reached insane 25%. Greece had then to carry out the opposite. Namely, heavy austerity and painful internal devaluation. This highlights that high inflation rates are one indicator of big economic crisis and leads to sentiment that northern countries exploited Greece (as northern countries did not carry out internal revaluations to lessen the crisis of Greece and imposed heavy austerity requirements), Greece loses from being in the monetary union and thus leaving the EMU all together (which might lead to even leaving EU in a pessimistic scenario if Grexit parties were to come to power). When Greece had been outside the monetary union, effects would have been less pronounced, as depreciation of Greek drachma would have happened as inflation differential

increased (follows from interest parity condition and the fact that real interest rate would be equal across countries or from just the fact that capital moves out from high-inflation country).

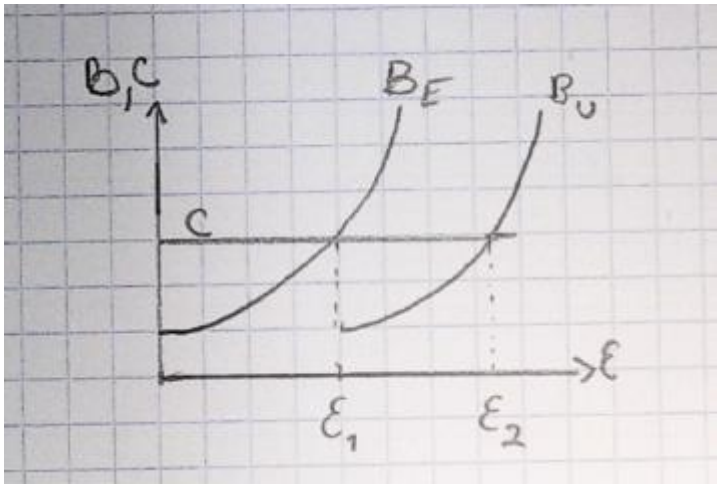
In the end, inflation rate differential can be of no concern, as Balassa-Samuelson tell us, as it can reflect productivity increases, but in general, differences of inflation rate preferences and differences of inflation rates can be both of great concern, if not massive. That is why fiscal policy is under heavy restriction (needing even European Commission`s approval) and financial stability and other macroeconomic trends (asset prices, bank credit) are also of much bigger focus in ECB, apart from price stability.

3. A fixed exchange rate regime will sooner or later be subject to speculative attacks.

Important distinction here is whether a fixed exchange rate is one-sided or both parties commit to it. If we consider the case of where one country unilaterally decides to peg to another bigger international currency, such as e.g. Swiss franc to euro, we have that the central bank of Switzerland must show financial markets that this peg holds. However, there indeed exists fragility of this peg and the problem is two-fold. For the first, fragility arises because the central bank of Switzerland has limited size of currency reserves. If it had unlimited supply of foreign currency, then it could supply it so that investors cannot cause the peg to break – then investors would not even start the speculative attacks. For the second, the peg is sustainable if there is confidence and trust that this will hold. It is important here to note that if trust is low in the peg, investors and financial market starts to challenge the peg as they fear the break from the peg and thus there is potential for gains and losses. If financial market challenges the peg, central bank must step up and defend it, depleting its currency reserves, therefore increasing the distrust that central bank will be able to defend it. This is a deadly embrace or doom loop (not in the context of banks-sovereigns, but in the context of distrust and reserve depletion).

The depletion of central bank reserves is also not an only concern. This is also actually what happened with Switzerland breaking its peg of 0.8€=1 Swiss franc, letting the currency appreciate. This happened in 2015 January. Around the same time as ECB had massive QE programmes (in EU jargon, Asset Purchasing Programme or abbreviated as APP) and the euro was expected to depreciate, and investors poured their money into Swiss francs as it was somewhat seen as safe haven. But due to costs of following the programmes of Eurozone, the Swiss authorities were not willing to supply these investors with their Swiss francs, which required printing with inflationary concern following, and with this decision the peg was broken and Swiss franc appreciated and till today is more expensive (appreciated) than it used to under peg.

The case of Denmark and its dear Danish krone is different. Danish krone is pegged to euro and it has so far been a successful peg. Danish krone is more insured against speculative attacks since both sides, Danish Central Bank and ECB, both commit to it. If Danish Central Bank has an issue with supplying euros as there is threat that krone might depreciate below the 2% margin floor, ECB steps in and supplies them. This is also likely because ECB and Eurozone is much bigger economic zone and helping out smaller Danish economic landscape does not cause substantial inflation by printing new euros. This is however not to say that Denmark remaining in ERM-2 as it negotiated for opt-out to adopt euro is smart and sustainable in the long run. In the moments of crisis, the likelihood of fixed exchange rate system breaking increases as benefits of the break might outweigh the costs and this has indeed nice analytical framework, which I present at last:



On x-axis, we have size of a shock, on y-axis we have units of costs and benefits. Curve C is flat as cost of breaking the fixed exchange rate system is the same regardless of the size of the shock. Curve B_E and B_U are benefit curves of breaking the fixed exchange rate system (the peg), they are positively sloped. B_E lies to the right of B_U because when it is expected that the fixed exchange rate was about to break, the benefits of breaking are higher as defending the peg against speculators is costly. Therefore, if the shock was of size $\varepsilon > \varepsilon_2$, both regardless of if there was expectation of break or not, benefits outweigh the costs, and we will see the peg breaking. This highlights that kroner-euro fixed exchange rate might also break if shock was of size $\varepsilon > \varepsilon_2$, regardless of the speculator attack. This highlights that financial markets keep this risk in mind and therefore the shift from curve B_U to curve B_E is also possible and speculative attack is a possibility, which highlights that smaller shock $\varepsilon_1 < \varepsilon < \varepsilon_2$ can now break the peg. As world is imperfect and reserves are not unlimited, when judged by one of the sides that fixed exchange rate is not making sense (as cost-benefit analysis might yield), the peg is breaking and this is also known by speculators, that is why they test the peg.

4. The ECB sets the repo rate with a view to the Eurozone as a whole, but this may not suit all member states.

True, the ECB´s Governing Council of 20 (as of 2025, 21 as of 2026 as Bulgaria joins the Eurozone) member state national bank governors and 6 ECB Executive Board members, decide once in a while (about every one and half months are the Governing Council meetings) on the repo rate and all the members of the Governing Council have to pursue Eurozone interest and not represent their own national economic concerns. Therefore, ECB looks at aggregates of the whole Eurozone and through analysis, they decide on the repo rate (among other instruments, such as marginal lending facility rate and deposit facility rate, which are to provide and receive overnight liquidity). The fact that this aggregate rate (aggregate repo rate) might not suit individual countries is obvious. Large Eurozone countries, such as Germany, have a lot of weight in the aggregate calculation and therefore Germany´s economic data has bigger influence on the aggregate rate, than, e.g., Latvia´s economic data. One tool to calculate suitable interest rate (repo rate) is to follow Taylor´s rule, which $r_t = \rho + \dot{p} + a(\dot{p}_t - \dot{p}) + b\dot{x}$, where ρ is natural interest rate, $\dot{p}$ is inflation target, $\dot{p}_t$ is current inflation and $\dot{x}$ is output gap. Following this Taylor´s rule, we can see that more the inflation differs with the target inflation rate of 2% in ECB (established in 2021 ECB`s Monetary Policy Strategy, until then analysis showed that the inflation target was around 1.8% as initially ECB considered the price stability as inflation of below, but close to 2%, which resulted target actually being not 2%, but

statistically retrospectively at 1.8%), the higher interest rate is desired. Therefore, closer is the union interest rate to its target of $\rho + \dot{p}$, where $\dot{p} = 2\%$, the bigger is the discrepancies between union and the member state`s desired interest rate.

The fact that repo interest rate (together with marginal lending facility and deposit facility rates) are for the banks, which in turn pass the rate down to other financial actors (through they face a little higher rate than banks as they seek profit, but due to competition this is rather low) and the fact that these commercial banks operate in multiple countries (with 33% of banks being from other EU country, though still low, requiring deeper financial integration with actual Capital Markets Union, which requires budgetary union as only Capital Markets Union can have destabilizing effect if panic takes over the financial market), interest rate across the countries is the same.

Therefore, the fact that one interest is for all the agents in all the countries, tells us that in some countries interest is lower than what is required, and some countries interest rate is higher than what is required. This of course means that ECB which is supposed to use monetary policy to stabilize the economies amplifies the problems. Therefore, one may conclude that ECB does not have to reign over only union`s monetary policy, but also fiscal policies to address local problems. In fact, this is what US Federal Budget does, where similarly to Eurozone, FED sets the interest at FOMC meetings but also supports those states with financial difficulties with financial transfers as monetary policy of dollar alone is not enough. This highlights the need for budgetary union, as monetary union with one interest rate (following from repo rate as a monetary policy instrument) alone is not enough.

5. Deficit-financing of defence expenditure in the EU is a threat to fiscal sustainability.

False, deficit-financing of defence expenditure in the EU is not a threat to fiscal sustainability. Let us remember that country can run even deficit and reduce its debt, when its GDP growth is bigger than the interest rate required on the government bonds. Indeed,

$$G - T + rB = \frac{dB}{dt} + \frac{dM}{dt} \Longrightarrow g - t + rb = \frac{\frac{dB}{dt}}{Y} + \frac{\frac{dM}{dt}}{Y},$$

from which we end up with $\dot{b} = g - t + (r - x)b - \dot{m}$, as $\dot{b} = \frac{\frac{dB}{dt}}{Y} + xb$, where $\dot{b}$ is growth of debt-to-GDP ratio, x is the growth rate of GDP, $\dot{m} = \frac{\frac{dM}{dt}}{Y}$ is change of money printed (seniorage), r is interest rate on government bonds , g is government spending to GDP and, t is taxes to GDP. Note that in the case of EU, member countries cannot print money as they wish and use this money to finance its budget, therefore with $\dot{m} = 0$, we have $\dot{b} = g - t + (r - x)b$. From this equation, we see that $\dot{b}$ may not increase even in the case of budget deficit ($G > T$), if we have growth rate of GDP x greater than the interest rate on bonds r. However, even if we have $\dot{b} < 0$ as deficit is too large and $r > x$, it is important to note that defence expenditure is not fixed costs. That is to say that procurement of defensive military equipment has big upfront costs and therefore this is investment in defence and not only defence for its current population, but also for future generations. This indeed catches the important aspect that current rigid fiscal policy rules of EU member state (such as Stability and Growth Pact or better known as SGP requirements of maximum $\leq 3\%$ budget deficit and $\leq 60\%$ budget debt) are huge impediment for member states to finance long-term, huge important investment projects (such as defence expenditure and green sustainability projects). Therefore, deficit-financing of defence expenditure in the EU is not a threat to fiscal sustainability. In order to not conflate the important long-term investment projects and short-term budget stability,

one may separate the two. This is especially the case of defence expenditure (as well as green environmental projects) as defence concerns are whole EU problem (just as climate change). Therefore, a suggestion would be to deal with this problem on EU level, just as actually `subsidiarity` principle tells us and which is followed also in the EU. To finance this common EU defence investment, one can use Eurobonds, which technically already exist as NextGenerationEU project of €800 in size is financed by common bonds. In this way, countries as a whole win in defence, there is better coordination between the countries, which ends up in more thought through procurement and in smaller buying queues for actual equipment.

6. The money stock (M3) does not necessarily increase following an increase in the money base.

True, but first let us define the terms. The money stock (M3) is money circulating in the economy, the money base is money supplied by the central bank. This distinction is important, because indeed increase in one does not necessarily cause increase in another. This is the case in periods of crisis. The reason is following: when we are in crisis, liquidity injections by the central bank (increase in the money base) are supposed to support the economic downturn as interbank and other markets fall and dry up. People, investors, banks start hoarding money, because in crisis, you are not sure whether you will get that money back. Therefore, when money stock increases, this (newly created) money ends up in banks, who however in turn do not pass it further, because as mentioned there is little trust out there. This explains why increase in the money base is not causing increase in the money stock. It is also important to note here that in the long-term this hoarded money will be circulated and thus increase of the money stock happens, however as this is long-term scale, the central bank can sell the bonds in its balance sheet, thereby reducing the money base and eventually money stock.

An example for such a situation is that Eurozone after sovereign debt crisis. ECB brough interest down to 0 (even deposit facility rate fell below 0% as it is about 0.5% below marginal refinancing rate) and started massive Quantitative Easing QE (Asset Purchasing Programme APP in EU jargon), this all increased both the money base and money stock. However, true to Milton Friedmann, money stock rose less than money base and inflation was of no concern. Inflation came under concern with the third decade of Eurozone and ECB has started to retire assets from its balance sheet (not renewing them to not provide further liquidity).