

Quiz 2 — Real Business Cycle model

Questions	Answers
1. Is a situation of capital over-accumulation possible in the Ramsey model?	☐ Dynamic inefficiency is possible in the Ramsey model. ☐ Dynamic inefficiency is not possible in the Ramsey model. ☐ This can be shown by comparing the level of capital from the benevolent planner's problem with that of households at the decentralized equilibrium. ☐ This can be shown by writing the same Lagrangian as in the decentralized framework, but replacing the intertemporal budget constraint with a feasibility constraint.
2. What is the Frisch elasticity?	☐ It is the elasticity of labor supply with respect to the wage, holding the utility of wealth constant. ☐ It is the elasticity of labor supply with respect to the wage, holding the marginal utility of wealth constant. ☐ It measures the substitution between leisure and time worked. ☐ It equals the parameter on the labor part of our utility function (η in the course).
3. What is the Hodrick–Prescott filter?	☐ A method for extracting the trend component and the cyclical component of a time series by solving an optimization problem. ☐ A method for extracting the unique trend component and cyclical component of a time series by solving an optimization problem. ☐ The cyclical component is obtained as the residual of the HP filter. ☐ The cyclical component is obtained as the relative deviation of the series from the trend. ☐ None of the above.

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4. In the canonical real business cycle model, does the labor input adjust at the extensive or at the intensive margin? Is this distinction important?	☐ The model adjusts at the intensive margin, because population evolves exogenously and only the number of hours enters the consumer's problem. ☐ The model adjusts at both the extensive and the intensive margin, because population changes over time, so both adjustments appear in the household's and the firm's optimization. ☐ The distinction matters because it illustrates the role of public policy in correcting the model's dynamic inefficiencies. ☐ The distinction matters because it illustrates one of the model's limitations.
5. Discuss the difference between a model characterized by unit roots and a model that does not satisfy the Blanchard–Kahn conditions.	☐ The Blanchard–Kahn condition concerns the number of eigenvalues of the model's matrix that are strictly greater than 1: there must be as many eigenvalues outside the unit disk as there are forward-looking variables for a unique steady state to exist. This rules out a unit root, since the steady state is reached. ☐ The Blanchard–Kahn condition concerns the number of eigenvalues of the model's matrix that are strictly greater than 1: there must be as many eigenvalues outside the unit disk as there are forward-looking variables for a unique steady state to exist. This rules out a unit root, because no steady state would exist otherwise (explosive solution). ☐ The Blanchard–Kahn condition states that no eigenvalue may lie outside the unit disk for a unique steady state to exist. It says nothing about root(s) on the unit circle. ☐ None of the above.
6. Can a model that satisfies the Blanchard–Kahn conditions have unit roots?	☐ Yes. ☐ No. ☐ None of the above.

The following .mod file is meant to simulate a stochastic model:

```
var ... ;
parameters ... ;

model
    ...
end

steady_state_model
    ...
end

shocks
    var ... stderr ... ;
end
```

Questions	Answers
7. Which error(s) are there in the structure of the .mod file above, which is meant to simulate a stochastic model?	☐ var and stderr cannot be on the same line. ☐ A semicolon is missing after each end, to mark the end of the block. ☐ I cannot declare L in this file. ☐ A semicolon is missing after each of the commands in this script. ☐ None of the above.