SIER GAME

Players manual

of the

BASIC REAL LEVEL

July 2003 / Sept. 2022

1. Introduction

"SIER" is an acronym for *Simulation of International Economic Relations*. As its name suggests, international macroeconomic relations are at the center of this game. The game aims to be an aid to studying economic relations between countries. To this end, in the SIER Game, several groups of players ("countries") play both with and against each other. As a second goal, the game demonstrates the difficulty of pursuing a sound economic policy, even if the economy is relatively simple and all relations and parameters are known.

This manual accompanies one of the seven standard versions of the SIER Game. [1] They differ in terms of the assumed economic reality, ranging from relatively easy to relatively complex.

In the SIER Game several economically linked countries - the players - pursue their policies simultaneously.[2] This set-up not only reflects the idea that interdependence between countries becomes increasingly important (including the international feedback effects of a country's own policies), but it also emphasizes the possibilities and impossibilities of international coordination of policies, as well as the dangers of conflicting policies: foreign countries may 'hit back' (retaliate). Furthermore, it opens the possibility of bloc formation by means of imposing import tariffs while excluding third parties from this agreement. Together with the competitive assignment in the game ("make sure you play better than the other countries"), this makes the game both interesting to play and instructive.

As to the latter, the game focuses on international macroeconomics. As a result, you may expect to gain insight in macroeconomics and the international aspects thereof. It should be borne in mind, however, that economic games such as the SIER Game are based on an economic model, which limits the economic insights to be reaped to the abstraction level that is used in the underlying model. All the same, experience so far has shown that with the aid of the SIER Game students can become familiar with many ideas and concepts in international macroeconomics surprisingly fast, especially if the difficulty level is increased gradually.[3]

First we will give an overview of the game in section 2. Next, in section 3, we will explain how political support is measured during the game. Section 4 will give a description of the sectors as they are assumed to behave in the underlying economy. Section 5 presents the policy instruments that are available during the game. Section 6 discusses cases where players face certain policy restrictions. An example of how an instrument affects the economy and political support is given in section 7. Finally, section 8 gives concluding remarks.

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[1] The SIER Game comes in seven standard levels and seven accompanying manuals. The introduction and sections 2 and 8 of those seven manuals are identical.

[2] The exception is version 1 that assumes closed economies. This version is typically used as a step up version.

[3] As is evidenced by Gremmen and Potters in 'On the Efficacy of Gaming', in *Journal of Economic Education*, Winter 1997.

2. The SIER Game in a nutshell

In the SIER Game the world is assumed to consist of a number of countries that ranges from two to ten, to be determined by the teacher. Let us assume a game with four countries. The governments of each of those countries (i.e., each of the four teams of players) simultaneously pursue economic policies aimed at maximizing prosperity which results in political support for the government of their country by the end of the game. The end of the game is interpreted as election time. In other words, each team tries to maximize its chances of being re-elected by maximizing the political support of its electorate. The assignment for each group is:

'Make sure that by the end of the game political support in your country is the highest in the world, but be sure to have added something to your political support during the game', where political support is assumed to depend on the state of the economy.[4]

To comply with this assignment each of the four governments formulates its economic policies (also to be referred to as 'impulses') for period 1. These policies are entered into the computer. Because of the linkages between the countries, the policies do not only influence the home economy, but also the economies of other countries. The exception is again version 1 where economies are closed. In versions 2, 3 and 4 of the game, the linkages consist of the trade channel, only. In versions 6 and 7 they are also linked through capital flows and international interest payments.

Based on the impulses of all four countries, the computer calculates the economic situation that results, which forms the starting point for period 2. Again players decide about their economic policies, the computer calculates the results for period 2 in terms of economic developments and the connected developments of the political support etcetera. When playing the game, the players can be confronted with constraints regarding the policies they can pursue. These constraints become effective if the government deficit exceeds a certain value and/or if the central bank has run out of its official reserves. In each round the economic results are converted into a score for political support. When the instructor thinks the time is right, she ends the game (in other words, elections are called) and the group with the highest political support wins the game.

3. Political support: how it's measured and how it develops

The political support score starts at 100.00 points[5] in all countries.

It increases at the highest rate if:

1. real private consumption of goods and services by households in your economy rises as fast as possible, where 'goods' are the items produced by private firms, both in the home

[4] The precise definition of 'political support' is discussed below.

[5] In the game, points are to be read as decimal points.

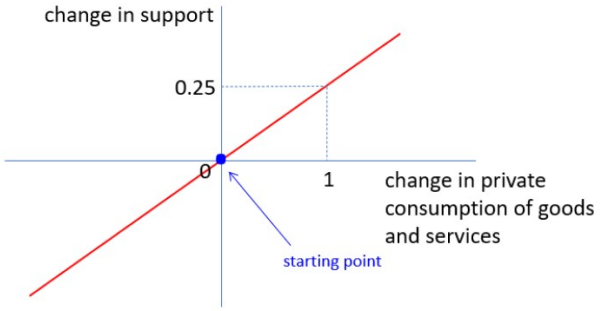
country and in the foreign countries (imported goods), and 'services' are the public services provided by the government (such as education, health care, police protection).

2. the rate of unemployment is zero; political support increases as long as unemployment is lower than 1.5%; the lower the rate of unemployment, the faster the increase in political support.
3. consumer prices are stable; political support increases as long as consumer price changes do not exceed 1% up or down; the lower the price instability, the higher the increase in political support.
   Note: overall consumer price level = average of consumer prices of home produced goods and of imported goods (incl. VAT of the home country and import tariffs imposed by the home country).

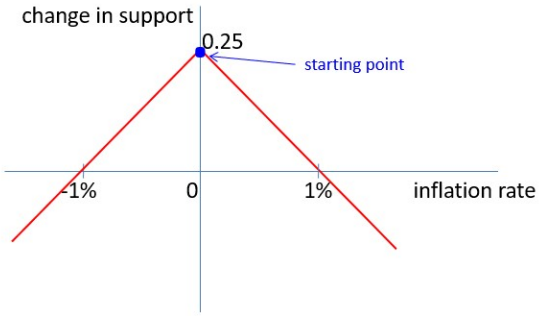
For each of the latter two items, the maximum political support bonus per period is 0.25.

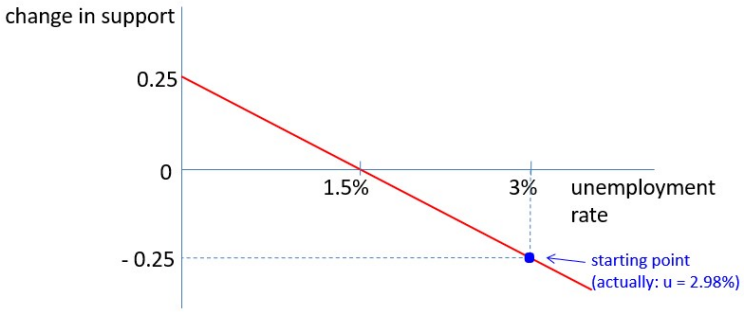
In this version of the game, if none of the countries pursues any policy, the economy is constant over time: nothing changes.[6] As a result, also private consumption does not change then. Hence, political support for that sake does not change either. Furthermore, the unemployment rate is (very close to) 3%, implying a loss of political support of -0.25. Inflation is zero, which gives a bonus in political support of 0.25. As a result, the total score for political support stays at 100.00 as long as none of the countries intervenes. This is referred to as "starting point" in Figure 1.

Figure 1: Change in political support



[6] As a matter of fact, since the unemployment rate at the start is just below 3%, there will be a slight rise of political support.





4. Description of the economy

The economy of the SIER Game in this version is characterized by:

- open economies
- substitution between the factors of production (labour and capital) within a country
- investments that are determined by profits that were made in the previous period
- producers (employers) who pay a social security tax for each employee
- no explicit monetary sector
- nominal wages in the private sector that are adjusted with the inflation rate of the previous period
- nominal wages in the public sector that are determined by the players, only
- exchange rates that are 'fixed but adjustable'
- gold and foreign exchange reserves that change with the surplus/deficit on the balance of payments
- policy restrictions that are imposed if a country runs out of gold and foreign exchange reserves

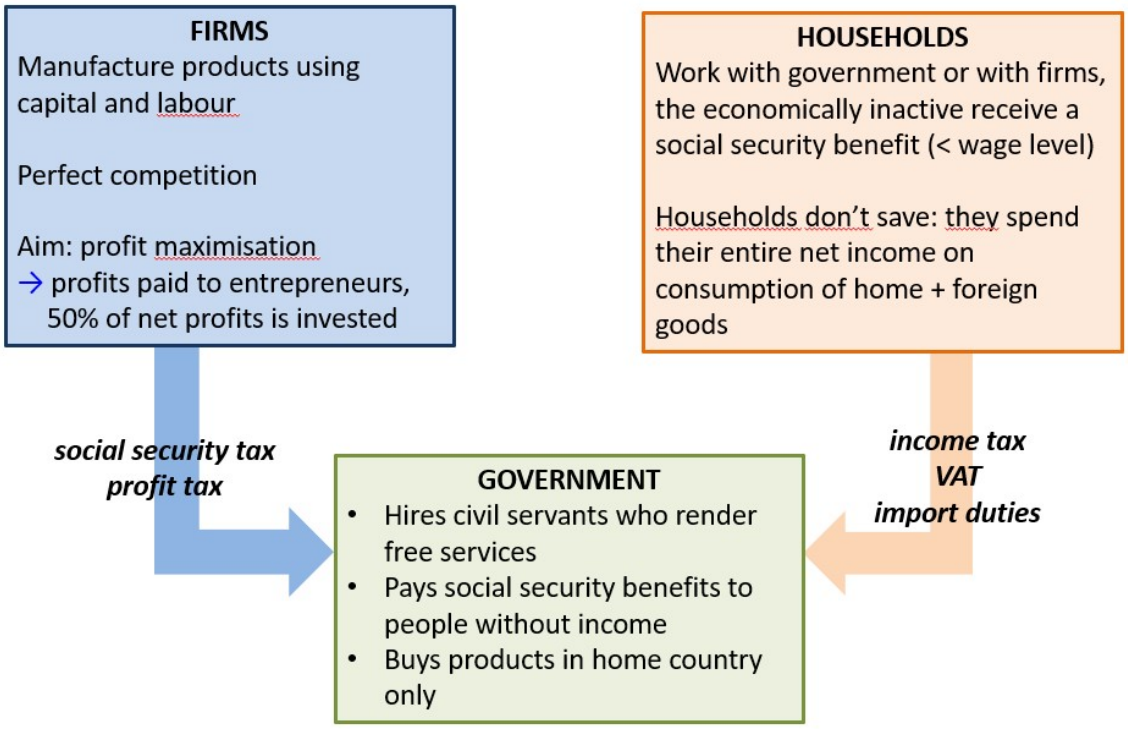
In the game, all countries are assumed to be initially identical in size as well as in economic structure.

There are three types of economic actors in each country:

1. the government (that is: you)
2. the firms
3. the households

Figure 2 shows a schematic representation of the economy of each country.

Figure 2: Sketch of the economy



The government

The government has the following tasks:

- it hires civil servants,
- it buys (uses) goods produced in the home country,
- it pays benefits to those without an income (unemployed, ill, on pension, etc.),
- it levies taxes.

The government hires **civil servants** at a specific wage rate for the civil servants. These civil servants render free services (education, health care, etcetera) to the households in the home country. Of course, these services promote welfare and therefore political support in the country. In line with the way government output is measured in practice, per time period, each servant is assumed to render one service to the public in the home country. In this way, the

number of services equals the number of civil servants and productivity in the public sector is fixed. The number of civil servants is one of the players' policy instruments, the wage rate for civil servants is another policy instrument.

In addition, the government **buys goods from private firms located in the home country**. This (real) material government consumption is a policy instrument for the players too.

All persons who are economically inactive receive a **social security benefit** from the government, which allows them to buy and consume goods. The level of this benefit is a policy instrument.[7] Note that a change is this benefit does not affect labour supply, because labour supply is fixed (see below).

The government levies five types of **taxes**:

taxes paid by households:
- income tax (also referred to as 'labour income tax' or as 'labour tax'): a percentage of household income, including social security benefits;
- import tariffs: a percentage of the value of imports;
- value added tax (VAT): a percentage of total private consumption (including imported goods).[8]

taxes paid by firms:
- profit tax: a percentage of the firms' profits;
- social security tax: a percentage of the gross wage rate sum.[9]

All of these percentages can be used as tools of economic policy.

The firms

Firms (companies) are assumed to produce only one type of product. This product can be applied in different ways: it is bought by households (domestic and foreign), by the government and by other firms (as investment goods). Furthermore, this product is produced under full competition. The firms produce this product by combining labour and capital (machinery). There is only one type of labour and one type of capital. Capital and labour can replace each other.[10]

In the short run, (i.e., within one round) the amount of labour hired by firms may vary and the amount of capital is fixed. The capital stock depreciates each period by 20% in this version of the game. At the start of the game, gross investments by the firms is equal to the amount of

[7] All instruments are discussed in detail below.

[8] Note that foreigners pay VAT in their own country on the goods they imported, so if they import goods from country X, they do not pay VAT in country X.

[9] The social security tax has no link with the social security benefit.

[10] Firm produce output according to the following production function: output = (amount of labour)$^{0.8}$. (amount of capital)$^{0.2}$, which implies that extra labour leads to extra output, that extra capital leads to extra output, and that capital and labour can replace each other.

capital depreciation, so the capital stock is constant over time. If in one period, firms have made a positive profit, it will lead to additional investments in the next period. These additional investments are equal to the amount of the firms' net profits. It takes one more period before these investments lead to expansion of the operational capital stock (installation delay). As net investments respond to the net profits realized in the previous period (decision delay), it takes a total of two periods before an increase in net profits leads to an increase in the number of operational machines.

Firms are assumed to maximize their profits. As the amount of machinery is fixed in the short run, an increase in production can only be realized at short notice by means of extra labour. At given labour cost per head, the supply of products increases if the selling price of those products (excluding VAT) increases.[11] This implies that the short-term aggregate supply curve slopes upward as long as the required labour for extra production is available, that is, as long as unemployment is positive. In case of zero unemployment, no extra labour is available, so a rise in the price of goods does not result in extra production: the short-term supply curve runs vertical. At that point output is at its full capacity level.

Summarized, the supply curve of goods is graphically represented as the kinked curve in Figure 3.[12]

Firms pay two types of taxes to the home government: profit tax and social security tax. The latter is a percentage of the gross wage rate and establishes a wedge between labour costs of the firms and gross wages received by employees.

The households

The largest part of the demand for goods stems from households (at home and abroad). These households supply labour and therefore earn a labour income which, after paying income tax, they spend on consumption goods. The households are either employed by the government or by firms, or are economically inactive (unemployed, on pension et cetera). Net household income is fully and immediately spent on goods, which are either purchased at home or in one of the other countries of the world economy. In other words, households do not save. They are the only sector that imports goods produced in foreign countries. The choice between domestic and foreign goods is determined by the prices of these goods.

Households pay three types of taxes:

- direct income tax on household income (including social security benefits)
- import tariffs on imported goods (initially, import tariffs are zero)
- value added tax on the value of total consumption

Note that families just work and consume, and that entrepreneurs only 'undertake business'

[11] This is because the marginal productivity of labour falls if more labour is hired (owing to the assumption of capital being fixed in the short run).

[12] An increase in the cost of labour will shift the upward sloping part of that curve upward/to the left, since higher labour cost implies a lower profit margin for each given selling price.

and invest. This implies that we assume a strict analytic division between the two categories: the classical saving hypothesis (i.e., wages are fully consumed and profits are fully saved) is supposed to hold.

What do the families spend their net income on?

- At given price levels, if their net income increases by x%, they will spend x% more money on each of the four goods (including possible import tariffs on any of them). In other words, the income elasticity of private consumer spending equals 1.

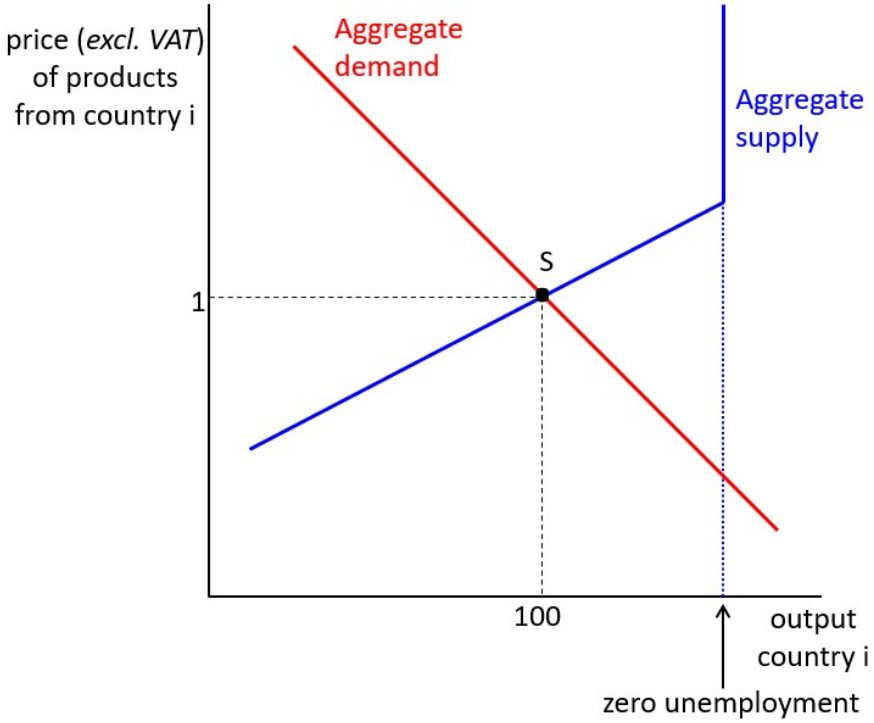
- If the price of a good relative to other goods rises by say 1%, private consumers demand 1.5% less of those products and the demand for the other products increases. That is, the elasticity of demand to relative prices equals -1.5. This implies that the aggregate demand curve for goods runs downward: if the price of country 1's product increases, sales to consumers at home and abroad fall (i.e., exports go down). The aggregate demand curve is also represented in Figure 3.[13]

Development of private wages

At the start of the game, the private wages paid out by the firms to their employees are equal to 0.64 in all countries. Each period, these wages adjusted with the inflation rate of the previous period. So if the general price level rises by e.g. 1% in period 1, then private wages in that country will be 1% higher in period 2 compared to the level of period 1. In case of deflation, private wages will decrease. Note that this only holds for wages in the private sector: the wages of civil servants are determined by the government. The same holds for the social security benefits: they only change if this is decided by the government.

[13] The vertical axis in Figure 3 displays the goods price before VAT, which implies that a possible rise in VAT shifts the demand curve to the left, but does not shift the supply curve.

Figure 3: Aggregate demand and aggregate supply of country i at the start of the game



5. The policy instruments available to the players

During the game, the players can use the following policy instruments in this version of the game:

1. Change in the **Value Added Tax (VAT)** rate. The VAT starts at 10%.
2. Change in the **tax rate on labour income** (including income from social security benefits). The tax on labour income starts at 16.4%.
3. Change in the **tax rate on firm profits**. The profit tax rate starts at 60%.
4. Change in the **social security tax**. Initially, this tax is 25%.
5. Change in **import tariff rates**. Import tariff rates start at 0% (free trade). Import rates can be discriminatory. So, in a four-country world, each country can levy up to three different import tariffs. Import tariffs cannot be negative.
6. Change in the number of **products purchased by the government**. Initially, the government buys 4 units of goods, where total output starts at 100.
7. Change in the **number of civil servants**. The number of civil servant starts at 22 (out of a total labour force of 125.75).
8. Change in the **civil servants' salaries**. These wages start at 0.64.
9. Change in the **social security benefit level**. The benefit level starts at 0.512.
10. **Desired devaluation** percentage. Initially, the exchange rate equals 1. Note that the exchange rate is defined as the number of domestic currency per unit of foreign currency. A devaluation is therefore a positive number, a negative number means a revaluation of

the domestic currency. Note also that the actual change of the exchange rate also depends on the desired de-/revaluation of the other countries. If, e.g., all countries want to pursue a devaluation of their currency by x%, then the exchange rates will not change. If e.g. country 1 wants to pursue a 2% devaluation and country 2 wants to pursue a 3% devaluation, then the currency of country 2 will actually appreciate by 1% relative to the currency of country 2.

Per round, each group may enter several impulses simultaneously. As in reality, all policy measures cannot exceed certain limits per time period. During the game, the relevant limits are indicated on the players' screens.

Furthermore, taxes and import tariffs cannot be negative and cannot exceed 100%.

6. Policy restrictions: the 'red card'

If a country experiences a deficit on the balance of payments for too long, it may end up with **negative gold and foreign exchange reserves**. In this version of the game, such a deficit on the balance of payments is the result of deficit(s) on the trade balance, which is usually accompanied by a deficit on the government balance. In case of negative gold and foreign exchange reserves, it is assumed that a supranational authority (such as the IMF) supplies the necessary gold/foreign currencies, but it will also put that country under guardianship which severely restricts the policy options for that country's government.
In the game, this means the country receives a '***red card***' and is forced to implement a policy of austerity for as long as the country holds that care. Specifically, for the next period, the government has to:

1. (Try to) devaluate its currency by 4%
2. Decrease the number of civil servants by 2%
3. Decrease government purchases of goods by 10%
4. Increase the import tariff on the imports of at least one country by 10%

Apart from these policy instruments, the country is allowed to use any other policy instruments than the above mentioned.

The country will keep this card as long as it has negative reserves. If in the next period, the country has positive reserves, the card will be withdrawn and the country is free again to pursue any policy it wants.

7. The impact of policies: an example

Introduction

Since this version of the game centers around the real sector of the economy, in this section we will focus on the effects of policies on the goods markets. On those goods markets, each round the computer determines the point where demand and supply equal. This point basically also determines the rest of the economy. In Figure 3, point S shows the standard starting position of the game (period 1). All prices (exclusive of VAT) and all exchange rates equal 1 and production is at 100. The full starting position is presented in the Appendix.

When governments act, they shift one or more curves in Figure 3.[14] The players have demand oriented and supply oriented instruments at their disposal. Examples of instruments that shift the demand curve of Figure 3 to the right (that is, increase demand) are: a lower VAT (instrument 1 above), a lower labour income tax (instrument 2), an increased amount of government purchases (instrument 6), an increase of the civil servants' wages (instrument 8), higher social security benefits (instrument 9), and a devaluation (instrument 10). Note that also *foreign policies* can shift your demand curve, e.g. if a foreign country decreases its labour income tax or decreases its tariff on imports from your country.

Examples of instruments that shift the rising part of the supply curve to the right, are a lower social security tax (that are by definition paid by firms, instrument 4). If net profits are made in the past, the capital stock rises and both parts of the supply curve shift to the right. Lower profit taxes (instrument 3) can be an effective instrument, provided firms make positive profits. The vertical part of the supply curve shifts to the right if the capital stock grows (owing to net profits made in the past) and if more workers become available for the private sector (owing to the dismissal of civil servants, instrument 7).

The main goal of the SIER Game is to make students understand how policy measures may affect an economy. Moreover, they should better understand that the effects of policies are relatively complex, even if the world were as simple as the standard version of the SIER Game. Every policy instrument can have positive and negative effects, so players have to find the best mix of policy instrument to use, given the state of their economy and the expected policies of other countries. Furthermore, some policy instrument can have different implications for the economy and political support, depending on whether or not the economy operates at its full capacity level.

To illustrate that, let us look at the effects of one of the above policies on political support.

[14] The exception is a change in profit taxes: this does not affect the demand or supply curve immediately, but it can affect the demand for investment products in the next period and the supply of products in the period thereafter if the capital stock changes.

Example: Impact of higher government purchases

Starting from point S in Figure 4, what will happen, if in period 1 a player decides that its government buys more products? [15]

The government does not buy imported (foreign) products. As a result, if the government buys 10% extra products, the demand curve on the home product market shifts out by 0.4 units.[16] At the initial price level, those extra products will not be supplied. This excess demand drives up the market price, which leads to two equilibrating forces: at a higher price, on the one hand, more products are supplied and, on the other hand, private consumption (both by home consumers and by foreign consumers of country 1 products) falls. The new point of intersection between the supply and the demand curve is point S'. In the figure, they still cross in the upward sloping part of the supply curve. Because of the increased demand, more goods are produced in the new situation than before, but because the supply curve is still unaffected, the extra output will only be supplied at a higher price level: given that the number of machines is fixed at the short term, an increased production can only be realized by an increase in the number of workers employed in the private sector.

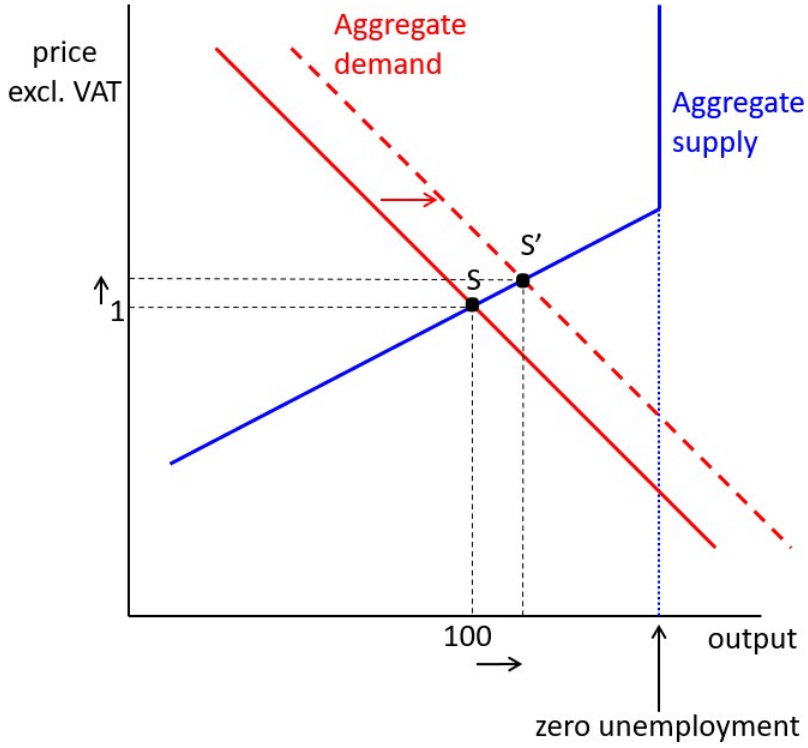
Still in period 1, the multiplier starts to work: the number of unemployed persons is reduced. As employed people earn more than unemployed people do, nominal household income increases. This implies a further outward shift of the demand curve. On balance, however, since the price level of the goods produced in country 1 increases, real private consumption of home produced goods falls slightly. In other words, the extra government consumption partly pushes aside ("crowds out") private consumption of home produced goods.

The table in Appendix 2 gives an overview of the economic situation in period 1. As can be seen, the size of the effects of this policy is quite small.

[15] It's important to realise that the effects of this policy can be quite different if we start from a situation of zero unemployment!

[16] Initially, government consumption equals 4, so a 10% rise implies 0.4 additional goods are bought by the government.

Figure 4: An increase of government purchases



The trade balance deteriorates, because the households will use their increased income to spend more, also abroad, so imports rise. Moreover, prices in the home country have gone up, which worsens its competitive position. This lowers exports and stimulates imports further.

In total, the effects on the elements of country 1's political support may be summarized as follows. On the one hand, support increases because of the increase in employment. On the other hand, the price level rises, so there inflation rate is positive. Private consumption hardly changes.[17]

Furthermore, the government runs a deficit[18]. The balance of payments worsens due to the trade deficit, so the amount of reserves held by the central bank is lower. This could become problematic if the central bank runs out of its reserves.

Does that imply that this type of policy would be ill advised? The answer is: not necessarily. It depends on the impact on other countries' political support and on the impact in the longer run. As for the latter, the increased price level of production results in higher net profits. This

[17] Consumption of home produced goods falls, while the consumption of imported goods rises.

[18] The deficit is mitigated by a growing economy resulting in a higher tax base for income tax, value added tax, social security tax and profit tax (which is cashed with one period delay). Moreover, the government saves money since it has to pay fewer unemployment benefits.

implies that in the next period net investments will be positive so that two periods from now the operational capital stock will rise and the supply curve will shift to the right (both the upward sloping part and, to a lesser extent, the vertical part). On the other hand, inflation causes the private wages to rise, so the labour costs for firms are higher. Overall, the first effect dominates and because of this supply reaction, output will increase further and inflation will go down.

As for the impact on the foreign countries: the increased demand for their products by the home country (say the home country is country 1) will create similar effects in those countries 2, 3 and 4 as it did in country 1, albeit to a lesser extent. Also, in those countries, output, prices and employment will increase and positive profits will result. The main differences with the impact on country 1's economy concern the magnitude of these effects (the demand-impulse in country 1 leaks away only partly), the balance on the government account and the balance of trade: whereas country 1 experienced losses in both respects, a surplus arises for the other countries. The explanation is straightforward: Country 1's government pays for its extra consumption (i.e., finances the impulse) while the other governments are passive; as a result, the government accounts in the foreign countries will turn positive. The same holds for the foreign trade accounts: the extra imports by country 1 are the extra exports by countries 2, 3 and 4. Hence, if country 1 were Japan, trying to stimulate the home economy through a fiscal expansion, the game would show that world output would be growing, that Japan's government account and Japan's trade account would turn negative, but that the other countries (China, European countries, United States) would benefit in both respects.

The developments in periods 1 and 2 must be seen as steps on the path towards a new long run equilibrium. In that situation, output will be greater than initial output. The adjustment pattern over time is as follows: in the short run more demand causes higher prices, this leads to higher profits, to higher investments in the next period, a bigger capital stock in the period after that, increased supply of products and as a result gradually lower prices, reduced profits, smaller net investments, smaller but still positive expansion of the capital stock, lower prices, lower but still positive profits, and so on, until prices are again equal to fixed production costs and profits are down to zero. On balance, in the end the products that the government buys extra will simply be produced by more people and more capital.

Note, however, that this is an example of a relatively small policy shock, as can be seen from the numbers presented in the table of Appendix 2. Because government purchases are initially equal to 4, which is only 4% of total GDP, a rise in these purchases by, say, 10% without any further policies has just small economic effects. Some of the other policy instruments will have a more powerful effect.

8. Concluding remarks

What are 'good' policy measures? It is up to you to find that out. With the description above, you should be able to work out the (main) effects of the policy measures at your disposal on each of the components of political support. In general, you will find that each measure has positive as well as negative aspects. This does not mean that there are no good policies. A sound policy *strategy* typically includes a combination of several policies, so that the negative effects of one policy measure are compensated for by the positive effects of other policy measures.

Before you start the game, you should have a general understanding of the main effects of each policy measure on each of the components of 'political support' in your country and you should consider several policy strategies (i.e., combinations of policy measures). Moreover, you should realize that although in this manual for the sake of convenience the international aspects of policies were not stressed, this will not hold in the actual game. On the contrary, while playing you will find out that they play an overwhelming role. Other countries also pursue policies, aimed at maximizing political support in their own country. However, through international spillovers, these policies will also affect the economy of your country and hence political support for your government. This will turn out to be one of the major lessons while playing the SIER Game.

Good luck during the SIER Game and have fun!

Appendix 1

Starting situation ("period 0") in a game with four countries

Country	**1**	**2**	**3**	**4**
Political support	100	100	100	100
Which is composed of				
• Real private consumption of home produced goods	60	60	60	60
• Total imports (real)	16	16	16	16
• Total services rendered	22	22	22	22
Inflation	0%	0%	0%	0%
Unemployment rate	2.98%	2.98%	2.98%	2.98%
Prerequisites for economic policy				
Government budget surplus	0	0	0	0
Change in central bank's gold and foreign exchange reserves	0	0	0	0
Central bank's gold and foreign exchange reserves	2	2	2	2
Policies pursued				
Change in Value Added Tax (VAT) rate	0	0	0	0
Change in labour income tax rate	0	0	0	0
Change in tax rate on profits	0	0	0	0
Change in employers' social security tax rate	0	0	0	0
Change in import tariff on goods from country 1	0	0	0	0
Change in import tariff on goods from country 2	0	0	0	0
Change in import tariff on goods from country 3	0	0	0	0
Change in import tariff on goods from country 4	0	0	0	0
Change in government purchases	0	0	0	0
Change in employment in government sector	0	0	0	0
Change in wage rate of civil servants	0	0	0	0
Change in benefits unemployed and other economically inactive	0	0	0	0
Desired devaluation	0	0	0	0
Real expenditures				
Private consumption of home produced goods	60	60	60	60
Gross investments	20	20	20	20
Material government expenditures	4	4	4	4
Total exports	16	16	16	16
Total imports	16	16	16	16
Production/factors				
Supply model (=0) or demand model (=1):	1	1	1	1
Product supply if enough labour available	100	100	100	100
Maximum output with full employment	102.99	102.99	102.99	102.99
Real sales by firms	100	100	100	100
Volume of physical capital	100	100	100	100
Employment in private sector	100	100	100	100

Employment in government sector	22	22	22	22
Total labour demand	122	122	122	122
Labour supply	125.75	125.75	125.75	125.75
Population	164.81	164.81	164.81	164.81
Number of unemployed workers	3.75	3.75	3.75	3.75
Unemployment rate	2.98%	2.98%	2.98%	2.98%
Income distribution				
Gross firm profits (nominal)	0	0	0	0
Labour income earned in private sector	64	64	64	64
Prices/wages				
Price of home produced goods excluding VAT	1	1	1	1
Price of home produced goods including VAT	1.1	1.1	1.1	1.1
Total costs per private employee	0.8	0.8	0.8	0.8
Gross wage rate in private sector (nominal)	0.64	0.64	0.64	0.64
Net wage rate in private sector (nominal)	0.54	0.54	0.54	0.54
Price level of (total) private consumption	1.1	1.1	1.1	1.1
Inflation	0%	0%	0%	0%
Gross wage costs per employee in government sector	0.8	0.8	0.8	0.8
Gross wage rate of civil servants	0.64	0.64	0.64	0.64
Gross benefit of unemployed and other economically inactive	0.51	0.51	0.51	0.51
Government				
Government income				
Revenue of Value Added Tax (VAT)	7.6	7.6	7.6	7.6
Revenue of labour income tax	16.4	16.4	16.4	16.4
Profit tax revenue	0	0	0	0
Revenue of employers' social security tax	16	16	16	16
Revenue social security tax paid by government	3.52	3.52	3.52	3.52
Import duty revenue	0	0	0	0
Government expenditures				
Total income civil servants and unemployed	16	16	16	16
Social benefits, other than to unemployed	20	20	20	20
Material government expenditures (nominal)	4	4	4	4
Government social security payments	3.52	3.52	3.52	3.52
Balance on the government account				
Government budget surplus	0	0	0	0
Tax rates				
Value Added Tax (VAT) rate	10%	10%	10%	10%
Tax rate on labour income	16.4%	16.4%	16.4%	16.4%
Tax rate on profits	60%	60%	60%	60%
Social security tax rate	25%	25%	25%	25%
International				
Trade account and exchange rates				
Trade account balance in home currency	0	0	0	0
Total exports (nominal)	16	16	16	16

Total imports (nominal)	16	16	16	16
Volume of exports by country 1 to country:	0	5.33	5.33	5.33
Volume of exports by country 2 to country:	5.33	0	5.33	5.33
Volume of exports by country 3 to country:	5.33	5.33	0	5.33
Volume of exports by country 4 to country:	5.33	5.33	5.33	0
Competitive strength	1	1	1	1
Tariff levied by 1 on imports out of your country:	0	0	0	0
Tariff levied by 2 on imports out of your country:	0	0	0	0
Tariff levied by 3 on imports out of your country:	0	0	0	0
Tariff levied by 4 on imports out of your country:	0	0	0	0
Exchange rate: number of currency 1 per unit of currency:	1	1	1	1
Exchange rate: number of currency 2 per unit of currency:	1	1	1	1
Exchange rate: number of currency 3 per unit of currency:	1	1	1	1
Exchange rate: number of currency 4 per unit of currency:	1	1	1	1

Appendix 2

Economic situation in period 1 in a game with four countries, after country 1 increased government purchases by 10% (*ceteris paribus*)

Country	**1**	**2**	**3**	**4**
Political support	100.04	100	100	100
Which is composed of				
• Real private consumption of home produced goods	59.98	60	60	60
• Total imports (real)	16.01	15.99	15.99	15.99
• Total services rendered	22	22	22	22
Inflation	0.07	0.01	0.01	0.01
Unemployment rate	2.63	2.98	2.98	2.98
Prerequisites for economic policy				
Government budget surplus	-0.09	0.01	0.01	0.01
Change in central bank's gold and foreign exchange reserves	-0.02	0.01	0.01	0.01
Central bank's gold and foreign exchange reserves	1.98	2.01	2.01	2.01
Policies pursued				
Change in Value Added Tax (VAT) rate	0	0	0	0
Change in labour income tax rate	0	0	0	0
Change in tax rate on profits	0	0	0	0
Change in employers' social security tax rate	0	0	0	0
Change in import tariff on goods from country 1	0	0	0	0
Change in import tariff on goods from country 2	0	0	0	0
Change in import tariff on goods from country 3	0	0	0	0
Change in import tariff on goods from country 4	0	0	0	0
Change in government purchases	10	0	0	0
Change in employment in government sector	0	0	0	0
Change in wage rate in private sector	0	0	0	0
Change in wage rate of civil servants	0	0	0	0
Change in benefits unemployed and other economically inactive	0	0	0	0
Desired devaluation	0	0	0	0
Real expenditures				
Private consumption of home produced goods	59.98	60	60	60
Gross investments	20	20	20	20
Material government expenditures	4.4	4	4	4
Total exports	15.98	16.01	16.01	16.01
Total imports	16.01	15.99	15.99	15.99
Production/factors				
Supply model (=0) or demand model (=1):	1	1	1	1
Product supply if enough labour available	100.35	100.01	100.01	100.01
Maximum output with full employment	102.99	102.99	102.99	102.99

Real sales by firms	100.35	100.01	100.01	100.01
Volume of physical capital	100	100	100	100
Employment in private sector	100.44	100.01	100.01	100.01
Employment in government sector	22	22	22	22
Total labour demand	122.44	122.01	122.01	122.01
Labour supply	125.75	125.75	125.75	125.75
Population	164.81	164.81	164.81	164.81
Number of unemployed workers	3.31	3.74	3.74	3.74
Unemployment rate	2.63	2.98	2.98	2.98
Income distribution				
Gross firm profits (nominal)	0.07	0	0	0
Net firm profits (nominal)	0.03	0	0	0
Labour income earned in private sector	64.28	64.01	64.01	64.01
Prices/wages				
Price of home produced goods excluding VAT	1	1	1	1
Price of home produced goods including VAT	1.1	1.1	1.1	1.1
Total costs per private employee	0.8	0.8	0.8	0.8
Gross wage rate in private sector (nominal)	0.64	0.64	0.64	0.64
Net wage rate in private sector (nominal)	0.54	0.54	0.54	0.54
Price level of (total) private consumption	1.1	1.1	1.1	1.1
Inflation	0.07	0.01	0.01	0.01
Gross wage costs per employee in government sector	0.8	0.8	0.8	0.8
Gross wage rate of civil servants	0.64	0.64	0.64	0.64
Gross benefit of unemployed and other economically inactive	0.51	0.51	0.51	0.51
Government				
Government income				
Revenue of Value Added Tax (VAT)	7.6	7.6	7.6	7.6
Revenue of labour income tax	16.41	16.4	16.4	16.4
Profit tax revenue	0	0	0	0
Revenue of employers' social security tax	16.07	16	16	16
Revenue social security tax paid by government	3.52	3.52	3.52	3.52
Import duty revenue	0	0	0	0
Government expenditures				
Total income civil servants and unemployed	15.77	16	16	16
Social benefits, other than to unemployed	20	20	20	20
Material government expenditures (nominal)	4.4	4	4	4
Government social security payments	3.52	3.52	3.52	3.52
Balance on the government account				
Government budget surplus	-0.09	0.01	0.01	0.01
Tax rates				
Value Added Tax (VAT) rate	10	10	10	10
Tax rate on labour income	16.4	16.4	16.4	16.4
Tax rate on profits	60	60	60	60

Social security tax rate	25	25	25	25
International				
Trade account and exchange rates				
Trade account balance in home currency	-0.02	0.01	0.01	0.01
Total exports (nominal)	15.99	16.01	16.01	16.01
Total imports (nominal)	16.01	16	16	16
Volume of exports by country 1 to country:	0	5.33	5.33	5.33
Volume of exports by country 2 to country:	5.34	0	5.33	5.33
Volume of exports by country 3 to country:	5.34	5.33	0	5.33
Volume of exports by country 4 to country:	5.34	5.33	5.33	0
Competitive strength	1	1	1	1
Tariff levied by 1 on imports out of your country:	0	0	0	0
Tariff levied by 2 on imports out of your country:	0	0	0	0
Tariff levied by 3 on imports out of your country:	0	0	0	0
Tariff levied by 4 on imports out of your country:	0	0	0	0
Exchange rate: number of currency 1 per unit of currency:	1	1	1	1
Exchange rate: number of currency 2 per unit of currency:	1	1	1	1
Exchange rate: number of currency 3 per unit of currency:	1	1	1	1
Exchange rate: number of currency 4 per unit of currency:	1	1	1	1