

# 1 Welfare states and their sustainability

This chapter analyses the question: are welfare states sustainable?

As we discussed last time, one reason why a welfare state is needed could be to protect workers in the developing countries when trade equalizes factor prices.

Another reason is to provide insurance when private markets fail to do so.

It is impossible for parents to know whether their children will be healthy or handicapped, talented or untalented, lazy or industrious.

They do not know their teachers, friends, bosses and spouses.

The redistributing welfare state offers insurance protection against such uncertainties.

As such, redistribution is legitimated by the goal of increasing allocative efficiency.

Why does not private insurance work?

It comes too late.

One can only sign insurance contracts when adult.

There are studies that argue that the only thing government insurance does is to crowd out private insurance, which works perfectly well.

But this argument only work when smaller risk is considered, which shows up later in life.

The following figure shows that public expenditures do crowd out private insurances to some extent.

However, an increase in the government expenditure of one percentage point results in a fall in the share of the private insurance of only 0.15 percentage points.

This suggests that the largest part of the state redistribution activities cover risks other than those that can be covered by private insurance.

In addition, even though adults can in principle sign insurance contracts there is a large efficiency problem called adverse selection.

If insurance companies cannot judge the statuses of individuals, they may not want to offer cheap insurances.

So healthy individuals do not participate in the market, only non-healthy individuals.

This may lead to a complete break down of the market.

# 1.1 Redistribution as an Allocative State Responsibility: A Simple Model

- The production function is given by  $f(K, L)$ .
- Both factors are paid according to their marginal products. So

$$f_K(K, L) = r$$

and

$$f_L(K, L) = w.$$

- Citizens are risk-averse.
- The number of efficiency units of labor supplied by a worker is given by  $X$ .

- $X$  is a random variable, and  $X = \theta_1\theta_2$  where  $E(X) = E(\theta_1) = E(\theta_2) = 1$
- $\theta_1$  reflects inborn characteristics. This could be things like laziness, intelligence, health, etc.
- $\theta_2$  reflects later reasons for wage variations, like accidents.
- $L$  is aggregate labor supply and is constant.
- Private insurance contracts can be made at the beginning of the adulthood, that is, after  $\theta_1$  is known and before  $\theta_2$  is known.
- The protection promised by the states defined before  $\theta_1$  and  $\theta_2$  are known.

- Individual risk, which is identical for all individuals is given by  $C > 0$ .
- $C$  is still unknown at the beginning of adulthood.
- The total amount of individual assets is  $\bar{K}$ , and they give the return  $r$ .

- Individual income before taxation and insurance is then given by

$$Y = \theta_1 \theta_2 w - C + r\bar{K}.$$

- The tax rate on labor is given by  $\omega$ .
- The private market can easily take care of the risk in  $C$  by offering a fair premium:  $\beta E(C)$  where  $\beta$  is the freely chosen degree of coverage.

- When risk-averse, citizens want full insurance, i.e.,  $\beta = 1$ .
- To insure  $\theta_1$  and  $\theta_2$  is more troublesome than insuring  $C$ .
- $\theta_2$  is difficult due to adverse selection, which may lead to a break down of the market and to insure  $\theta_1$  is impossible.
- It is assumed that  $C$  can be insured but that  $\theta_1$  and  $\theta_2$  cannot be insured.
- Government insurance takes place through the tax system.

Since government incomes are assumed to go back to citizens, i.e., we assume that the government is benevolent, the government budget constraint is

$$T = \omega w.$$

The income is therefore equal to

$$Y = \theta_1 \theta_2 w(1 - \omega) - E(C) + T + r\bar{K}$$

What is the mean and standard deviation of the income?

In general, if

$$Y = a + bX,$$

then the mean of  $Y$  is given by

$$E(Y) = E(a) + bE(X) = a + bE(X)$$

where  $E(X) = \mu$ .

The variance of  $Y$  is given by

$$\begin{aligned} \text{var}Y &= E(Y - E(Y))^2 = E(a + bX - (a + bE(X)))^2 = \\ &= b^2 E(X - E(X))^2 = b^2 \text{var}X \end{aligned}$$

The distribution, or spread, of the  $X$  values around the expected value can be measured by the variance, which is defined as

$$\text{var}X = E(X - E(X))^2$$

or

$$\text{var}X = E((X)^2 - 2XE(X) + [E(X)]^2),$$

which is equal to

$$\text{var}X = E(X)^2 - 2[E(X)]^2 + [E(X)]^2$$

or

$$\text{var}X = E(X)^2 - [E(X)]^2$$

So, in general we have

$$\text{var}Y = b^2(E(X)^2 - [E(X)]^2)$$

Let's look at an example.

Assume that we have the following three values of  $X$ : -2, 1 and 2.

They happen with the same probability  $\frac{1}{3}$ .

This means that the mean is given by

$$E(X) = -2 * \frac{1}{3} + 1 * \frac{1}{3} + 2 * \frac{1}{3} = \frac{1}{3}.$$

and

$$E(X^2) = (-2)^2 * \frac{1}{3} + (1)^2 * \frac{1}{3} + (2)^2 * \frac{1}{3} = \frac{9}{3} = 3$$

So plug this into the expression for the variance to get

$$\text{var} X = \frac{9}{3} - \left(\frac{1}{3}\right)^2 = \frac{26}{9}.$$

The standard deviation is then

$$SX = \frac{\sqrt{26}}{3}.$$

Remember that we had

$$\text{var}Y = b^2\text{var}X.$$

The standard deviation of  $Y$  is defined as

$$SY = bSX.$$

Now, back to the model.

The income is equal to

$$Y = \theta_1\theta_2w(1 - \omega) - E(C) + T + r\bar{K}$$

In this model the mean of the income is given by (because  $E(\theta_1\theta_2) = 1$ )

$$E(Y) = w - w\omega - E(C) + w\omega + r\bar{K} = w - E(C) + r\bar{K}$$

and the standard deviation is

$$S(Y) = S(\theta_1\theta_2)w(1 - \omega).$$

What happens to the mean as the level of taxation goes up?

Because  $\frac{\partial E(Y)}{\partial \omega} = 0$  the mean is unaffected by redistribution.

What happens to the standard deviation?

Because  $\frac{\partial S(Y)}{\partial \omega} < 0$  the standard deviation is reduced by redistribution and since agents are risk-averse this increases their expected utility.

This is of course very intuitive, the government takes away risk by redistributing income.

If citizens would be risk-neutral than they would not benefit from the fact the standard deviation is reduced.

What is important of course is that renegotiation after the type is revealed cannot be made.

That is, people that turned out to be healthy and clever (having  $\theta_1 > 1$  or  $\theta_1\theta_2 > 1$ ) should not be able to claim back the payment they have made to the less fortunate.

Note also that this is a partial analysis.

$\omega = 1$  would in this model be first best, fully reducing the risk.

But there are of course negative of redistribution.

At some point, citizens start to talk about confiscation.

Here comes another argument in defence of the welfare state.

Consider the health insurance.

If  $\omega$  is low, then people tend to buy private insurances to cover the risk in  $\theta_2$ .

The richer you are the better insurance you get and the better treatment you get.

Since good treatment is a scarce resource it means that people having a cheap insurances not only get a low coverage but also a low level of treatment.

## 1.2 A model of open borders

There are  $n$  identical countries where capital and people can move freely and without any migration cost among the countries.

So we have that

$$r_i = r_j = r, w_i = w_j = w \quad \forall i, j = 1 \dots n.$$

Assume that labor is perfectly mobile.

A condition for an equilibrium in the labor market is the equality of the net wage and transfer incomes for all types of workers.

So we have

$$\theta_1 \theta_2 w (1 - \omega_i) + T_i = \theta_1 \theta_2 w (1 - \omega_j) + T_j \quad \forall i, j = 1 \dots n.$$

As  $T_i = \omega_i w$  the left hand side becomes

$$w(\theta_1\theta_2(1 - \omega_i) + \omega_i)$$

or equivalently

$$w(\theta_1\theta_2 - \omega_i(\theta_1\theta_2 - 1))$$

Hence,

$$\begin{aligned} w(\theta_1\theta_2 - \omega_i(\theta_1\theta_2 - 1)) &= \\ &= w(\theta_1\theta_2 - \omega_j(\theta_1\theta_2 - 1)) \quad \forall i, j = 1..n \end{aligned}$$

For this equilibrium to hold it is necessary that the tax rates are equal.

However, each country has incentives to undercut the tax rate.

By doing this, the unfortunate people leave the country, and fortunate people from other countries come in.

This simple example clarifies the argument.

Assume that country  $i$  uses no taxation at all and country  $j$  use a tax rate equal to 100 per cent. The previous equation becomes

$$w\theta_1\theta_2 = w \quad (1)$$

This equation does only hold if all citizens are identical ( $\theta_1\theta_2 = 1$  for all citizens).

Consider the case when one person is fortunate, having  $\theta_1\theta_2 = 2$ , and one is unfortunate, having  $\theta_1\theta_2 = 0$ .

The fortunate person if living in country  $i$  would earn an income equal to  $2w$  whereas she would only earn  $w$  if living in country  $j$  (because she has to pay for the unfortunate).

However, the unfortunate person would earn nothing in country  $i$  but get  $w$  in transfers in country  $j$ .

Each country has incentives to undercut the tax rate to attract the fortunate and chase away the unfortunate.

This way welfare states cannot survive when the factors of production are free to move across borders!

This is bad news, not only from an distributional point of view but also from also from an efficiency perspective.

Recall that  $S(Y) = S(\theta_1\theta_2)w(1-\omega)$  and we just found that  $\omega = 0$  in systems competition.

That is, there will be no redistribution even though risk averse individuals want it.

The “inclusion principle” does therefore not work according to this theory.

A policy implication is that harmonization of taxes may be a remedy but this is difficult given the heterogeneity of countries.

Let's summarize Sinn's perspective in terms of the New (now old) EU constitution.

In the "New EU Constitution" it was suggested that each EU citizens could stay in every member state up to five years with some restrictions on the social security.

After these five years, she would get a permanent residence permit with full social security.

Hans-Werner Sinn was very critical to this proposal.

He argues that migration in itself is something positive as it improves the allocation of labor between countries.

Migration from Eastern Europe to Western Europe for example is necessary to get an efficient allocation of labor until the eastern countries have caught up with the western.

However, again, people also have incentives to move to get social benefits rather than jobs.

The result is that countries with large welfare states become poor and countries with small welfare states become rich.

An example of this is when New York in the 60s implemented a generous welfare program with the purpose to get people out of the streets.

The effect was a large immigration from other states up to the point where New York was almost bankrupt.

The program was canceled in 1975 when the banks were no longer willing to lend money.

The EU proposal came at a time when many Eastern European countries had entered the union.

The wage levels in these countries are one seventh of the wage level in former West Germany.

The level of social transfers is about one third.

In fact, the wage level in the Eastern European countries and in Portugal and Greece is one third of the level of social security in the German welfare state.

A harmonization of the welfare systems would lead to a large migration to the west, which would require large transfers to the east and much unemployment with very low productivity in the poorer regions.

Sinn suggested instead that transfers should be given to those who work.

Those who not work would keep the social security from the home country.

Even though these arguments make sense, some recent research shows a different picture.

I will now discuss a paper by Doyle, Hughes and Wadensjö, 2006, which will be available at CES and on the home page.

In the run-up to the 2004 EU enlargement there were increasing concerns in the old member states about its effect on labor markets and immigration flows.

One such concern regarded “welfare tourism”.

In the end, only Ireland, Sweden and the UK opened up their labor markets to workers from the ten new Member States.

The study shows what happened in these countries.

In Sweden, the authors look at two different variables, the amount of social assistance and support to family members living in another country.

First of all, the immigration flows were very small.

The figure shows that there were about 4000 individuals who received social assistance, both before and after the system changed.

Total support to family members living in another country is about 9 million Euro.

About 100 000 Euro is paid to family members living in one of the ten Accession States.

So there is no evidence of welfare tourism to Sweden.

What about Ireland?

The immigration flows were much larger than those to Sweden.

The authors argue that this was due to strong labor demand.

In Ireland you need a “Personal Public Service Number” to take up a job or access state benefits.

The number of individuals who have registered from the ten Accession States was in 2004 59 000 and in 2005 the number almost doubled to 112 000.

At the same time, less than 1000 accession state nationals were signing on the unemployment register in March 2006.

This implies that there is no evidence for welfare tourism in Ireland either.

Apart from this it is shown that so called EU10 nationals in fact have a lower unemployment rate, 2,4 per cent, than the Irish Nationals, 4.4. percent.

So it seems like the immigrants came to work, not to use the welfare state.

There is also no evidence of displacement of native workers.

How could we explain this?

It seems like the cost of moving are large.

What type of costs could that be?

- Language barriers
- Geographic proximity
- The level of job vacancies in the host country.
- The immigrants do not have any connection (net working) to the host country.

The empirical evidence indicates that language barriers and the level of job vacancies matter most.

The large flow of immigrants to Ireland could be explained by the fact that, in contrast to Sweden, English is the primary language and there were also many job vacancies during this time.

If geographic proximity would matter, then one would expect Sweden to attract more immigrants.

However, prior to accession two-thirds of the flows of Accession nationals into Western Europe went to Germany and Austria lending support to geographic proximity as well as language to matter (my feeling is that people from Eastern Europe speak German at least as good as they speak English).

There are also interesting empirical evidence in this study regarding the labor market, which we will discuss a bit later in the course.