Economic policy in a resource abundant micro-state

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Abstract

The Faroes is a very small resource abundant economy with no industry other than fish food production providing most foreign exchange income. All remaining hands available are employed in non-tradables production in order to maintain a modern nordic welfare society. The article contends that the main macroeconomic concern should not be international competitiveness, but should rather be smoothing the foreign exchange supply. Public appropriation of the resource rent would make macroeconomic sense and increase equity.

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Contents

1 Introduction

With a population of roughly 50 thousand the Faroe archipelago in the North Atlantic is a tiny economy. Compared to other micro-states, dependencies and small island countries it nevertheless is one of the richest, it is technologically advanced and it has a highly educated population living in a well informed Nordic social democracy. The economy also differs quite much from most other neighbouring countries' by the fact that its potential long run resource rent and foreign aid constitute an amount of approximately 15 percent of GDP as foreign exchange gifts to the economy[1], which is several times more than the 3 percent of GDP which Norway according to Regjering (2020) estimates to be the perpetual annual income from its carbon resources. Although small and large economies are governed by the same economic principles, smallness and resource abundance distinguish the Faroe economy from most of its neighbours.

The article is organized as follows: section 2 presents the relevant data about the Faroe economy especially in relation to production and international trade. section 3 looks to economic theory to find a simple but relevant model to the specific context of a tiny and resource abundant economy. The simple model is evaluated in relation historic data and to the fiscal policy options of an economy with a pegged currency, and finally in section 4 some discussions and concluding remarks.

2 Small island economy

Three characteristic features of the Faroe Islands need to be considered before choosing a model to analyse economic dynamics and to evaluate economic policies. First, that the Faroes is a small country which suffers the consequences of having very small markets and a small labour force, but the same demand for quality of life and welfare as consumers anywhere

[1] As a part of the Danish Kingdom the Faroes receive approx. 1 billion DKK from the Danish state, and the natural resources are worth more than 2 billion DKK. As demonstrated in e.g. Norman (1986) and Matsen and Torvik (2005) the value of natural resources in exports can in principle be treated as foreign exchange gifts

else. Second, the small island economy experiences relatively large shocks from either the world market demand for fish or from the ocean supply of marine resources. Third and last, most exports do not depend on marginal productivity of workers in the sector, because cost free resource rent is the source of the single most important foreign exchange revenue of the country.

2.1 Diseconomies of scale

As noted the Faroes would to most people seem as an almost unimaginably small economy, but nevertheless it is a distinct economy with idiosyncratic inflation, wage formation and economic cycles, despite its status as a dependency of Denmark, subject to Danish monetary and exchange rate policy. Not only are small island countries marred by diseconomies of scale, imperfect markets, high economic volatility and high transportation costs[2], but they also suffer consequences of smaller pool of talent[3], irregular interpersonal dealings and outright corruption[4].

The Faroes successfully exploit the abundance of natural resources and specialize in fishing and fish-farming to a degree that maximizes the labour force in the production of home market services. While a quarter of Danish employment is engaged in export production[5] it is only 15 percent in the Faroes[6], which leaves 85 percent of the workforce to produce the public and private services needed to maintain a Nordic welfare state compatible with the neighbouring countries, which is paramount to keep emigration from escalating[7].

Specialization of this magnitude is a double-edged sword. For all its benefits specialization also increases the probability for shocks from high market and product concentration. In her article Jansen (2004) concludes that *"...the more concentrated are the exports, the more volatile a country's terms of trade are likely to be, in particular if exports are concentrated*

[2]Krugman (1991), Armstrong and Read (2004), Tisdell (2009)
[3]Farrugia (1993), Briguglio et al. (2009)
[4]Þórhallsson (2011), Gylfason (2009), Sibert (2009)
[5]Wanscher 2021.
[6]Statistics Faroe Islands website
[7]In addition to a constant leak emigration has surged in severe economic downturns

in commodities."

Measured by the mean product concentration index of exports[8] for Northern Europe 2010-2019, the Faroes are of course at the top of the table with an index of 0.64, the other fishing nation Iceland at 0.45 and the oil nation Norway at 0.36 while Denmark and Sweden are at 0.09. Exporting only a few products makes a country very vulnerable for fluctuations in prices of these few items on only a few major markets. Adding insult to injury the few items are all fish products with correlated price variation. A staggering 96 percent of merchandise exports are primary goods compared to an average of 28 percent in the smaller countries in Northern Europe[9].

2.2 Shocks are external

From the literature we know that commodity producers and very small countries are more prone to terms of trade shocks than other economies[10]. This is even true for the small sample of Nordic countries, where Norway as an oil producer and Iceland, Greenland and Faroes as very small countries and commodity producers have far more volatile terms of trade indices than have Denmark, Sweden and Finland[11]. Standard deviation of the terms of trade statistics 1995-2018 in the Faroes is 3.5 times that of Denmark.

This article defines an internal shock as coming from changes in domestic demand. External shocks then by exclusion are those deriving from foreign demand (prices), changes in interest rates and exchange rates (out of Faroese control), and most notably changes in maritime resources, be it fish stocks or fish-farming environment.

According to this definition most shocks to the Faroe economy are external. Apart from being extremely vulnerable to global events like the financial meltdown of 2008 and

[8] https://unctadstat.unctad.org

[9] Denmark, Finland, Sweden, Ireland, Estonia, Latvia, Lithuania. Items classified under the first 4 main categories of the SITC nomenclature are classified as primary products. Data 2010-2019 from Eurostat and Statistics Faroe Islands

[10] Imam (2008), Endegnanew et al. (2013)

[11] Data 2000-2018 on *"Net barter terms of trade index (2000 = 100)"* from the World Bank website https://data.worldbank.org

the pandemic of 2020, changes in foreign trade conditions and fluctuations in the maritime environment present the most frequent economic challenges to the Faroe economy.

2.3 Foreign exchange gifts

The Faroes to a large extent are a commodity exporter, and the commodities exported are whole fish or low processed fish products. Even if the processing industry is protected from domestic and international competition by various means[12] between 60 and 80 percent of the major species are exported as whole fish, frozen or chilled. Production on board the fishing vessels is prohibited in order to provide jobs at land based fish factories.

Due to technological progress and rising productivity employment in fishing and fish-processing is steadily falling. Employment in the fishing industry has a clear negative trend the last 35 years. Fish-factory relative employment has declined by 2.7 percent points every ten years and fisheries employment has declined 2.3 percent points[13].

It would be very difficult for the Faroes to compete internationally in fish-processing, because the production is easily relocated to countries with lower wages as the technological requirements are low and transportation costs have been falling. On the other hand there will always be some handling and preparing of fish for transportation. Producing quality products from fresh fish also must occur at or near the landing sites or fish farming stations.

There is no traditional industry other than the fish factories working part of the fish caught in the ocean or taken from fish-farm cages. A few firms who mainly supply the domestic market occasionally export their products or services, and a few others produce import competing goods and services. Nevertheless these activities are negligent in relation to the aggregate view of the model. For the rest of the paper it will be assumed that there is no substantial traditional industry in international competition.

Second, the fish-factories have for decades been heavily subsidised and otherwise pro-

[12] Fish landings in foreign ports is prohibited or fined, on-board freezing and processing is prohibited.

[13] At the same time, though, in the emerging fish farming industry employment is up 1.0 percent every ten years.

tected from foreign competition. Until the beginning of this century the industry received financial support of various kinds, and the last twenty years it has been protected by law prohibiting fishing-firms to land their catch in foreign ports, and prohibiting fishing-vessels to produce fish products at sea. Without any protection all products would have been produced at sea.

These considerations indicate that including the production of the fish-factories, fishing-firms and the aquaculture production into a joint sector in the model would be quite realistic.

The benefit of the traded goods sector to the consumers is not the fish produced but rather the foreign exchange it provides for consumption of imported goods and services. The supply of foreign exchange is produced by the factors: capital, labour and natural resources, but as the natural resources are not directly remunerated capital and labour receive their share as well.

As shown in Búskaparráðið (2014) the optimal contribution from fish stocks to the output of the fishing fleet is approximately 40-50 percent of revenue. This corresponds quite well with the prices for one-year quota purchases in 2018 and 2019, and also with one-year quota lease prices in Iceland in 2020[14], which all lends support to the so called *Wilen's rule of thumb*[15]. Support for this approximative claim is also found in Á. Daníelsson (2002), Matthíasson (2012), Hannesson (2017) and Gunnlaugsson et al. (2020).

Foreign exchange provision therefore consists of foreign exchange production and a foreign exchange gift which comes cost free. Using the estimates mentioned, the potential foreign exchange gift from the fish-stocks is approximately 1.5 billion DKK[16]. Adding to this an estimate of the resource rent from the fish-farming industry of 1.3 billion DKK[17] and the 1 billion DKK annual grant from the Danish state, the total potential foreign exchange gift amounts to 3.8 billion DKK, which amounts to approximately 15 percent of GDP. Compared

[14] See Oskarsson (2021)

[15] Here quoted from p. 290 in Asche et al. (2009) referring to Wilen (2000).

[16] The actual resource rent is naturally varying with volume and prices and was in Búskaparráðið (2020) estimated to 1.0-1.2 billion DKK in 2017

[17] See Ellefsen and Rógvi (2018)

to the perpetual real interest of the successful Norwegian oil-fund of approximately 3 percent of GDP[18], it is evident that the Faroes have an enormous welfare advantage to most other countries.

3 Theory and relevant model

Economics is a reasonably unified science but its models are not one-size-fits-all solutions. The inescapable forces of choice and markets are present in every economy but respecting context is nonetheless crucial for correct application of the theory. The article argues that economic analysts' insistence on international competitiveness issues while assessing the future trajectories for the Faroe economy may not be appropriate.

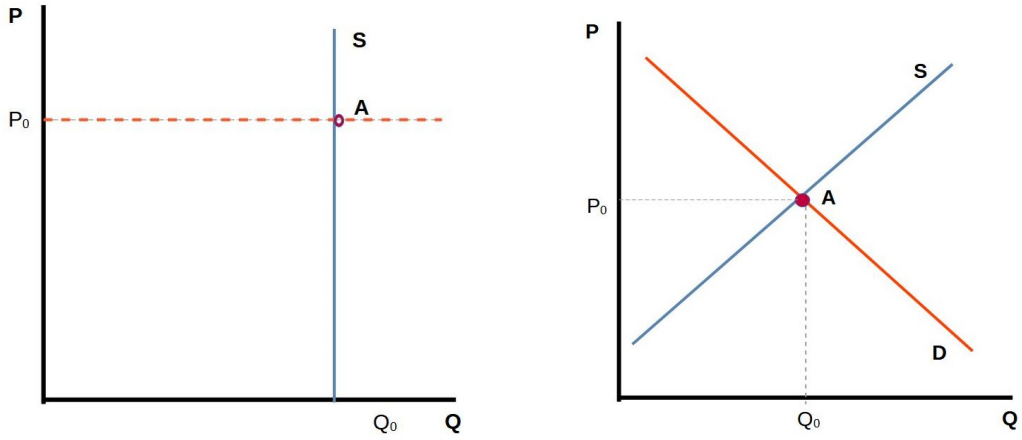
One way to test the model claiming that exporting firms' international competitiveness is a macroeconomic problem would be to look trade data, because it would show up in the statistics as an international trade problem and ultimately as a current account problem. For the last 20 years the current account surplus has on average been 7.0 percent of GDP albeit with a standard deviation of 7.2. compared to Denmark's average of 4.3 (s.d 2.8) and Norway's 10.8 (s.d. 4.4).

Even in such a tiny economy the general distribution of production between tradables and non-tradables is in the long run determined by consumer preferences. Chasing their highest return production factors move out of sectors facing declining demand to sectors whose demand is rising. Export production has no pre-eminence in this regard because to capital and labour only relative return from production of tradables and non-tradables determines the direction they will flow. Export production on the other hand is the major transmitter of external shocks to the economy in the short run, picking up tremor from natural resource supply and from foreign demand.

For the reasons provided in section 2 there is evidently no point in applying the standard one sector small open economy model to the Faroes. Consider instead a slightly modified

[18]See Regjering (2020)

two sector model of an economy producing traded and non-traded output[19]. The supply and demand curves in the non-traded goods market have the expected elasticities, while the traded sector has perfectly inelastic supply and perfectly elastic demand. Apart from the booming oil sector most standard *Dutch disease* models inspired by Corden and Neary (1982) assume a traditional traded goods industry competing on international market terms. While the supply side of the traded goods sector in Røisland and Torvik (2004) and in Torvik (2016) is price elastic this article argues that in the Faroe context it is more appropriate to assume perfectly inelastic supply in the traded sector market as shown in Figure 1. It will be assumed that the fishing industry (fishing and fish processing) and the aquaculture (harvest and processing) is one traded goods sector.



(a) Traded sector

(b) Non-traded sector

Figure 1: In the traded goods sector (1a) consisting of fishing, fish-farming and fish-food production, supply is perfectly inelastic. In the non-traded goods sector (1b) demand and supply are elastic.

In the non-traded market demand and supply curves must coincide, the supply curve slope is positive for the standard reasons while the negative slope of the demand curve represents the imperfect substitutability with imports. As argued in section 2 it is assumed that fishing, harvesting and processing in the short run can be aggregated into one traded goods sector with perfectly inelastic supply. At any one time the wild fish stocks and the

[19]First presented in Búskaparráðið (2002)

mature fish in cages are given, which determines supply. The products will be sold at internationally determined prices, as the world fish markets are highly interconnected and the Faroe producers have no market power.

The major economic shocks are delivered via the traded goods sector, either as variation in the resource supply or as fluctuation in foreign demand. To which degree the shocks imply changes in the demand for labour in the sector can not be determined from this simple model. But assuming that labour demand in fish-processing is proportional to the amount of fish landed, any variation in landing or harvest will change demand for non-traded goods.

3.1 Shocks and policy responses

Positive shocks either come from rising international prices of fish products or from increasing supply of marine resources. These shocks will increase foreign exchange income and improve the current account. Incomes in the traded goods sector will be increasing, which in turn will create higher demand in the non-traded sector. Higher demand will be met with higher prices and increased production, assuming there is available labour, and incomes in the non-traded sector will rise. This is the income effect.

The longer lasting the shock, increased employment and higher prices will put an upward pressure on wages in the non-traded sector in order to satisfy the increase in demand for its products. If markets were left to their own devices, rising non-traded sector wages would attract labour from the traded sector and an equilibrium would be restored with higher prices and increased non-traded production.

In order to fight expected inflation the government can tighten fiscal policy, but this will not affect the source of the shock, which emanates from foreign demand or natural resource variation and which will continue to have effect. Tighter policies will only reduce income in the non-traded sector and thus curtail private consumption and investment, which again suppresses imports and further improves the current account[20]. If government wants to

[20]This is in accordance with the findings in Endegnanew et al. (2013), that the effect of fiscal policies

restore aggregate employment levels to pre-shock levels it will have to push non-tradables sector employment below its former level, in order to counter the increased employment in the tradables sector. Given that governments with only fiscal policy tools at hand are reluctant to interfere against positive shocks at all, the less likely such a super tight fiscal policy.

Incomes will be more unevenly distributed, because the resource rent will still be funnelled to capital and labour in the traded sector, while growth in factor incomes in the non-traded sector will be impeded. The long lasting substantial current account surplus is mirrored by an increase in foreign assets which mainly emanate from the country's natural resources.

It can be concluded that international competitiveness is of no concern as the positive shock is a fully justified increase in remuneration for exactly the production factors in export production (foreign exchange supply). On the other hand we can conclude that duration of the positive shock is of major importance. What may seem as a short lived demand shock may well be a long lasting if not permanent change in terms of trade, and a seemingly temporary change in natural resource supply could be a longer lasting shift in natural abundance.

Any trend improvement in productivity in tradables production will naturally move production factors out of foreign exchange production and into home market non-tradables production. If this is not facilitated and maybe even obstructed by government policies, potential welfare is not pursued. Rather than being a sign of failing competitiveness, the long trend of falling employment in the fishing industry has been a successful adjustment to terms of trade and to increased productivity in the sector.

When negative shocks either make natural resources less abundant or reduce export prices due to decreasing demand, incomes in the traded goods sector fall. Demand for non-traded goods and services falls and as a consequence prices fall and unemployment rises. An equilibrium at even lower prices will only be restored in the non-traded sector if wages fall and supply increases, perhaps partially restoring former employment levels.

in micro-states primarily is a direct but short lived effect on imports while there is little effect on the real effective exchange rate.

Expansionary government intervention can restore the previous non-tradables market equilibrium, but it is unable to fully restore aggregate employment in the economy, because the tradable goods sector is still depressed. Aggregate employment can only be restored by expanding non-tradables sector production volume and prices beyond previous levels, pushing prices and perhaps even wages above previous levels. Equilibrium is restored by attracting traded sector workers to the non-traded sector.

To sum up, in recessions expansionary government intervention will tend to raise wages and thus attract workers from the tradables goods sector to the non-tradables sector. In a boom contractionary intervention will increase inequity in the distribution of the foreign exchange gifts, particularly the resource rent which is politically contested.

Contractionary policies are understandably very rare, and mostly serve as an academic exercise, while expansionary policies sometimes do occur. In a volatile environment, like the small islands economy, fiscal policies in general are partly ineffective and partly very difficult to administer. When recessions are truly hurting the economy, the government does not have the resources to fund sufficient interventions, let alone the creditworthiness to borrow the funds necessary, as described in J. Daníelsson and Oskarsson (2012) when the Faroes in the 1990's experienced a veritable sovereign-debt crises with debt-to-GDP ratio of 140 percent, a 40 percent contraction of GDP and a net emigration of 15 percent of the population.

3.2 Stabilization

Even if international competitiveness rarely is of major concern, the focus of attention for economic policy still is stabilization of the economy. The Faroese economy and society in general is marred by a constant drain of talent and by flares of labour emigration during recessions. Average migration statistics 1970-2019 show an average 0.21 net emigration with a standard deviation 5.5 times the mean[21].

Even if the Faroes by no means were any where near the epicenter of the 2008 financial

[21] See table A.1 in the Tables section

turmoil, a net lender, they were severely hit by the crises. Iceland, on the other hand, was one of the hot-spots and the *Geysir crisis* was renowned around the world for its devastating effect, leaving Iceland with a debt seven times GDP. Nevertheless employment declined as much in the Faroes and migration accelerated to the same degree as in Iceland, and within 8 years employment in Iceland was back at pre-crisis levels whereas it took 9 years for the Faroes. Migration was positive in Iceland after 6 years and in the Faroes after 7 years. This serves as an illustration of Iceland's ability to adjust in the short run at least in part due to its national currency. Short and medium run adjustment in the Faroes is much more difficult and is solved in two ways. First by labour emigration, which is immensely costly for the economy, because it frequently leads to permanent loss of productive resources. Second by labour market restraint, resisting the temptation to raise contractual wages too high in boom years. In boom years wages in the non-traded goods sector temporarily rise in informal arrangements, but not to the same degree in formal negotiations.

This article argues that a stabilization fund could contribute to stabilize the economy by its function as a cushion towards large swings in foreign exchange income. Wealth and stabilization funds are usually associated with oil and mineral exporting countries, where they are an effective tool in macroeconomic stabilization efforts. But even if the Faroes are not an oil or mineral exporter, annual resource rents to GDP in the Faroes are larger than in most of them, and fluctuations in foreign exchange income have proven to be quite unmanageable for this tiny nation.

The maritime resources of the Faroes, valuable fish stocks and firths providing fish-farming environments, are renewable resources as opposed to the non-renewable deposits of subsoil coal, minerals, oil and gas. The fact that there is a finite volume of the resource in the ground leaves countries with only one solution to preserve this common national wealth for all generations of citizens, and it is to save the resource rent in a sovereign wealth fund. There is no known end to the benefit stream from a renewable resource like the fish-stocks and the fish-farming environment, which makes a wealth fund superfluous. But as fluctuation

in the resource based goods trade is so volatile, a stabilization fund would be a suitable arrangement to strengthen the hand of government, providing ample finance in recessions.

In an article Bova et al. (2018) conclude that they *"...find that fiscal policy in resource-rich countries tends to be procyclical and more so than for other economies."*. Sugawara (2014) report that *""The econometric analysis reveals that stabilization funds contribute to smoothing government expenditure""*. Most likely this is true for the Faroe economy as well, although there is not sufficient quality data to confirm the claim. But more to the point, they do not find that stabilization funds by themselves are sufficient. Strong social and political institutions are needed to ensure the discipline needed for such an arrangement to work properly.

The Faroes have successfully adopted the high standards of democratic institutions of the Nordic countries, albeit modified to this tiny environment and unfortunately to some degree skewed by the flaws and defects often found in small societies. Confronted with high macroeconomic volatility and a apparent tendency for procyclical fiscal behaviour (as shown in figure A.1 in the Figures section, an adequately large stabilization fund could successfully contribute to insure the economy against the most severe foreign shocks.

Collecting the the resource rent for this purpose will provide as much macroeconomic stability which possibly can be achieved in a tiny and vulnerable economy. Redirecting the resource rent into private and public spending will also serve to increase equity and general welfare. Appropriation of the resource rent will enable government to reduce taxes, which will elevate the general welfare and mitigate emigration tendencies.

4 Concluding remarks

The most important features which characterize very small resource abundant economies are that

1. they suffer severely from diseconomies of scale,

2. the most severe economic shocks are external to the local economy, coming from foreign demand or from the supply of natural resources, and

3. a substantial part of foreign exchange income is resource rent acting as a buffer between international price level and labour productivity in the fishing industry

The Faroe exports are almost exclusively fish-products leaving the economy quite exposed to shocks from foreign demand and from volatile supply of natural resources, which makes fiscal policies quite difficult. In order to stabilize the economy from negative shocks the government will have to borrow heavily in case of a long lasting or severe recession, as was the case in the 1990s. With a properly managed stabilization fund, the consequences could have been less damaging.

Smoothing the income from the volatile resource rent would benefit the economy. Terms of trade and the current account are several times more volatile than in most other countries, and procyclical fiscal policy amplifies the trade cycles. A stabilization fund would alleviate the consequences of such constant unrest.

It is not only through recessions that a stabilization fund would benefit the economy, but it would also support the government in smaller bouts and larger booms of foreign exchange income. With appropriate rules a stabilization fund would reduce the cyclical expansions which otherwise would have been intensified by procyclical fiscal policy.

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Tables

Table A.1: Migration statistics based on data 1970-2019

	Faroes[a]	Iceland[a]	Denmark[a]
Maximum	1.16	2.40	0.75
Third Quartile	0.54	0.40	0.29
Median	-0.01	-0.01	0.18
First Quartile	-0.71	-0.23	0.11
Minimum	-4.34	-1.51	-0.17
Mean	-0.21	0.19	0.20
Standard Deviation	1.14	0.72	0.18

[a] All calculations are based on population data 1970-2019 from the respective national statistics offices.

Figures

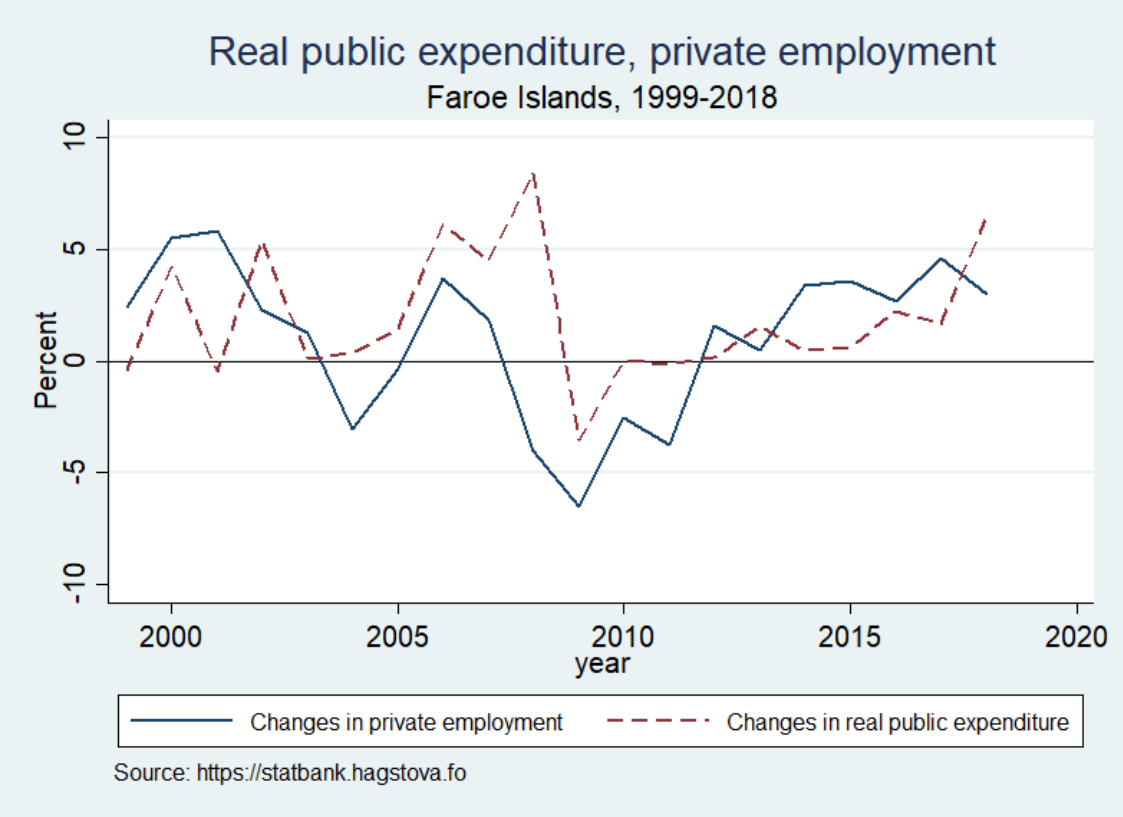

Figure A.1: Changes in government real expenditure and Changes in private employment are positively correlated, indicating that fiscal policy is procyclical. Log differences.