

GREENLAND'S BALANCE OF PAYMENTS AND FUTURE INDEPENDENCE

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Abstract

Why is the current account of Greenland a topical issue, while those of Denmark and of the island of Bornholm in the Baltic Sea are not? Has the current account anything to do with future independence? It is argued that balance of payments and foreign debt are closely connected to political and economic national identity. Until recently Greenland's current account was positive by large amounts, which were unexplained, as it proved impossible to uncover corresponding capital account deficits. However, improved balance of payments statistics together with simple computations demonstrate that surpluses partly disappear as an artifact if contents of imports of the various types of final demand are increased in accordance with the recent input output-table of Greenland. It is illustrated that discontinuation of transfer payments from Denmark would entail dramatic downfalls of production and living standards and large current account deficits. It is possible to remove the trade balance deficit and the need for Danish transfers simultaneously, but this would require higher tax rates and huge increases of exports.

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Greenland's, Denmark's and Bornholm's balance of payments

Concurrently with the preparations for self-governance, to be introduced on the 21st of June 2009, Greenland's balance of payments, vis-à-vis Denmark and vis-à-vis foreign countries, has increasingly become a political issue. Until recently Greenland's current account was positive by large amounts, which were unexplained, as it proved impossible to uncover corresponding capital account deficits.¹ Annual surplusses in the 1990's were about 2.5 mia DKK, of which about 2.0 mia DKK were unexplained,² and over the years they accumulated into incredibly large amounts, as compared to Greenland's GDP of about 10 mia DKK, cf. a paper by Lars Lund entitled "Missing: 20 milliard crowns".³ There were conjectures of corresponding accumulations of private foreign assets,⁴ and until the publication of improved balance of payments statistics, which partly solved the puzzles, it was "much regretted that no current account or capital account statistics exist for Greenland".⁵

Contrariwise in Denmark, where the balance of payments almost disappeared from the public debate after several decades as the perennial problem of economic policy. It has been expressed as "the balance of payments being ripe for an exhibition case in a museum".⁶ During the ongoing debate about Danish adoption of the euro it has been declared with firm voice that introduction of the euro would render the balance of payments problem "less straining after giving up the crown"⁷ or simply eliminate it, "as monthly statements of the current account are no longer compiled or published".⁸ So far Denmark has not become a member of the European Economic and Monetary Union despite repeated referenda in 1992 and 2000, but nevertheless the balance of payments disappears still further from the focus of political interest, apparently because of the view, that "specific targets for the balance of payments are superfluous and inexpedient".⁹ The Danish current account is becoming as uninteresting as that of the island of Bornholm in the Baltic Sea, which has, by the way, a population of a size comparable to that of Greenland. Summing up, the balances of payments of Greenland, Denmark and Bornholm,

respectively, can be characterized as follows:

- Greenland: increasing importance, problem of surplusses; has no independent currency, heading towards self-governance; 56.000 inhabitants.
- Denmark: fading interest, problem of deficits; has still independent currency, enjoys sovereignty; 5.4 mio inhabitants.
- Bornholm: uninteresting balance of payments; no independent currency, no sovereignty; 44.000 inhabitants.

Below, it is discussed how this can be understood: how the current accounts have changed in Greenland and Denmark, how surplusses and deficits can possibly be explained, how the balance of payments can be or not be a problem, and how the balance of payments and transfer payments from Denmark are connected to the self-governance process.

Greenland's current account

The discussion presupposes estimated values of some basic elements of Greenland's national accounts as expressed by the following three national account identities. First, the national income accounts identity (1) shows on the left hand side the supply of goods and services: domestic production (Y) and imports (M); on the right hand side the use of goods and services are split into a few categories of final demand: private consumption (C), private and government investments (I), government consumption (G) and exports (X); the figures are estimates for 2006 in mia DKK:¹⁰

$$(1) \quad \begin{array}{ccccccccc} Y & + & M & = & C & + & I & + & G & + & X \\ 10.6 & & 5.9 & & 5.3 & & 2.1 & & 5.6 & & 3.5 \end{array}$$

Second, the current account of the balance of payments (2) describes the flows of money to Greenland, namely export earnings

(X) and net transfer payments from abroad (P), and flows of money from Greenland, namely imports expenditure (M):¹¹

$$(2) \quad \begin{array}{rclclcl} \text{BP} & = & \text{X} & - & \text{M} & + & \text{P} \\ 1.7 & & 3.5 & & 5.9 & & 4.1 \end{array}$$

Third, government budget surplus (GS) is the difference between total income, namely taxes (T) and transfer payments from abroad (P), and total expenditures, which are composed of transfer payments from government to citizens (TR), government expenditures on goods and services (G), and government investment (I_G):¹²

$$(3) \quad \begin{array}{rclclclcl} \text{GS} & = & \text{T} & + & \text{P} & - & \text{TR} & - & \text{G} & - & \text{I}_G \\ 0.4 & & 4.2 & & 4.1 & & 1.7 & & 5.6 & & 0.6 \end{array}$$

Y production in Greenland, GDP (10.6)
M imports (5.9)
C private consumption (5.3)
I investments (2.1), composed of private (I_p , 1.5) and government investments (I_G , 0.6), $I = I_p + I_G$.
G government consumption (5.6)
X exports (3.5)
BP balance of payments, current account (1.7)
P net transfer payments from Denmark (3.8) and the EU (0.3)
GS government surplus (0.4)
T taxes (3.4) and government enterprise earnings (0.8)
TR transfer payments to citizens (1.2) and subsidies (0.5)

The national income accounts identity (1) is a real account and contains only amounts of goods and services and no purely monetary payments without a corresponding reverse flow of goods and services. Thus, public consumption (G) includes only consumption of goods and services, not government transfer payments or negative transfers (i.e. taxes) without a reverse flow of goods and services. Public consumption may be produced by government institutions, e.g. by hospitals, or by private enterprises, e.g. private cleaning companies, from which the government buys cleaning services.

The government surplus (3) shows flows of money to and from government. It includes transfer payments from abroad (P), most of which enters Greenland through the public budget. Of the total

transfers (4.1), Danish transfer payments contributes 3.8, including the so-called block grant (3.1); further 0.3 are payments from the EU for fishery rights. Payments between the three sectors, the private and the public sector in Greenland and foreign countries, can be described in more detail; public and private savings can be calculated, which together make up the current account surplus.¹³ Total public expenditure (7.9), the sum of transfer payments (TR), public consumption (G) and government investments (I_G), amounts to a very high share of GDP, about 75%. In Denmark the corresponding share is about 50%.¹⁴

The current account of the balance of payments (2) shows flows of money to and from Greenland, including transfer payments from abroad (P). Only current payments are included, but not payments related to investments in financial assets or physical assets like enterprises and property. These constitute the capital account of the balance of payments. A current account surplus corresponds by definition to a capital account deficit, namely payments for acquisition of foreign assets including reserves of Danish crowns in Greenland. However, this identity can not be established in Greenland's national account because of lack of data.

Greenland used to have considerable current account surpluses, thus in 2001 2.3 mia DKK or 25% of GDP. The corresponding asset acquisitions could only partly be accounted for: foreign direct investments in Greenland (0.3 mia DKK), and portfolio investments abroad mostly as savings of pensions (-0.9), together net foreign asset acquisitions (-0.6). The remaining part of the current account surplus (1.7) could not be accounted for.¹⁵

The national account data for 2006 in the identities (1)-(3) are compiled from various sources: national income statistics provide an estimate of GDP (Y), but not private consumption (C) or investments (I);¹⁶ public accounts provide all data for identity (3);¹⁷ the recently published balance of payments statistics provide all data for the identity (2), and a number of discrepancies between these figures and those appearing in the foreign trade statistics are disregarded.¹⁸ The missing figures for private consumption (P) and investments (I) are computed from

total final demand and the relative size of various components of final demand as appearing in the input-output table for Greenland 2004.¹⁹

The implausible large current account surpluses in the 1990's could partly be explained by a very low, implicit import share of total final demand, about .25, and increasing this to a more plausible .40, in accordance with the input-output table for 1992, would eliminate the surplus.²⁰ According to the new balance of payments statistics imports are increased considerably, but so are exports; the surpluses decreased, but they are still considerable, between 20% and 28% of GDP in 2001-2005. So the current account riddle is only partly solved. The figures for 2006 used here are maybe more realistic: the current account surplus is smaller, 16% of GDP, and the total import share in final demand is:

$$(4) \quad \frac{M}{C + I + G + X} = .36,$$

which is in accordance with a total of .37 in the input-output table for 2004. According to Statistics Greenland the total imports were no less than 65%-70% of GDP in the 1980's, with a maximum of 72% in 1985, due to ambitious investment programmes and other public expenditures following the introduction of home rule in 1979. Then it declined to a level of about 55% in the years after 2000; 72% and 55% imports of GDP (M/Y , cf. identity (1)) are equivalent to import shares of final demand ($M/(Y+M)$) of .42 and .35, respectively.²¹

As the share of imports is typically high for countries, which are small and have a specialized production structure, import shares are supposedly very high in Greenland, which fulfills these conditions to an extreme degree. On the other hand the high share of public consumption - 34% of final demand as compared to 19% in Denmark - tends to decrease the import share, as public consumption has a large share of services with relatively low contents of imports.

The import shares for Greenland (total .37) are not very much higher than those of Denmark (total .29). For comparison are

stated import shares from the input-output table for Greenland 1992 as well as those for Denmark in 1988, when Denmark still did not enjoy self-sufficiency concerning energy.²²

final demand:	C	I	G	X	total
import share:	m_C	m_I	m_G	m_X	
input-output 1992:	.48	.63	.30	.34	.40
Denmark 1988:	.25	.38	.07	.36	.27
input-output 2004:	.48	.51	.22	.38	.37
Denmark 2004:	.23	.35	.09	.44	.29

The riddle of the current account surplusses can be solved and the unexplained surplusses eliminated by increasing the import shares to the levels of the input-output table of 1992 and thereby increasing imports (M) and lowering GDP (Y) in the left hand side of the national income accounts identity (1).²³ The GDP estimates in the national account statistics are probably too high, as the GDP estimate of the input-output model for 2004 is 7% lower.²⁴

Denmark's current account

For many years the current account was a predominant problem for Danish economic policy, and the problem was not unexplained surplusses as in Greenland, but persistent deficits. In 1963 The Economic Council, the so-called "institution of wise men", was established as part of the so-called "over-all economic solution", and 1963 was also the year, when the last current account surplus appeared for many years to come. Every year the current account came out with ad deficit, and every year "the wise men" lamented for it in the annual report. But the deficits were actually sound business until 1975: from 1963 to 1970 foreign debt increased from 4% to 13% of GDP and then declined slightly until 1975. Foreign debt was kept down by low international interest rates and high international rates of inflation. Both of these came to an end in 1975, and during the following five years for-

eign debt increased to 27% of GDP.²⁵

Danish foreign debt as percent of GDP:

1963	1970	1975	1980	1988	2002	2007
4%	13%	12%	27%	40%	16%	1%

Then belts were tightened. From 1981 onwards exports exceeded imports with few and small exceptions, but not sufficiently to cover interest payments on foreign debt, which continued its increase to a maximum of 40% of GDP in 1988. This debt problem mainly originated during a period of five years, from 1975 to 1980, and the cause can with some justice be labeled over-consumption, as investments were relatively small during this period. Oil price hikes were a significant part of the problem.

But in 1990 the current account became positive and has been so almost every year since then. Foreign debt was eliminated. Again the cause can with some justice be labeled over-consumption, this time of North Sea oil. Resources are exhausted, and they do not figure in the capital account, as natural capital is not accounted. Incomes from from extracting North Sea oil are not accumulated into af "petroleum fond" as in norway, but are spent on current consumption and repayment of old debt. They figure in the current account as income. From 1983 to 2000 changes in the current account and in exports of energy were as follows:²⁶

mia DKK	1983	2000	change
current account	-12.8	20.2	33.0
energy exports	-21.4	13.5	34.9

That the improvement of the current account corresponds so closely to extraction of North Sea Oil is coincidental, as many other factors have an impact, and there are fluctuations from year to year. But surely, the elimination of foreign debt is mainly financed by exhausting natural capital in the North Sea. Depreciation of physical capital also contributed, as relatively low

levels of investment also improved the current account.²⁷

Balance of payments problems

An important reason for the fading interest in the Danish current account is of course that it turned positive. From 1981 there was a surplus in Danish foreign trade of goods and services (the trade balance), from 1991 also for foreign trade together with interest payments and other current payments (the current account). The balance of payments problem has changed character, but still it is a problem, and it figures persistently among economic key figures. The main problem nowadays seems to be, that it is increasingly difficult to understand, why current account deficits were ever considered a national problem.²⁸ The question of the balance of payments as a problem can be divided into the following four separate issues:

1. Currency problems

In the days of old the immediate challenge was to finance current account deficits and to provide hard currency for vital imports. In the period of "dollar shortage" in the 1950's imports were regulated. Also later it was an important priority for the Central Bank and for interest rate policy to prevent that "currency reserves were drained to the dregs". After the liberalisation of international capital movements in the 1980's borrowing abroad and procuring foreign currency have been possible without problems. However, it can not be ruled out that problems of payments and currency provision may surface in the future, as indicated by international currency crises in the 1990's and recent financial crises²⁹ and demonstrated by the collapse of the krona in Iceland in 2008.³⁰

Membership of the EU and the EMU will not remove the payment problems of governments, cf. the recent difficulties of Ireland, Spain, Portugal, Greece, Hungary and the Baltic states, especially Latvia and Lithuania.³¹ It may reduce exchange rate risk for individuals, but it does not prevent private citizens and compa-

nies from borrowing in foreign currency and thereby exposing themselves to exchange rate risk as in Iceland and in several EU-countries outside the euro, for example in the Baltic states, which have borrowed and thus speculated extensively in euros. Banks go into bankruptcy anyway, and people lose their money anyway.

Basically, the currency problem is but the most immediate an superficial of the balance of payments problems, and the fundamental, real problems are not eliminated by discontinuation of the balance of payments statistics. Rather than preventing balance of payments problems and currency crises, the euro itself may run into serious trouble because of these very events. So the argument for the euro as a solution of balance of payments problems is a fallacy.

2. Foreign debt and public debt

Current account deficits are accumulated as increases in foreign debt and thus in the longer run cause real burdens, as it becomes increasingly difficult to borrow abroad and as debt must be repaid in terms of real goods and services. Foreign debt is partly private debt, partly public, government debt, and public debt is partly domestic, partly foreign government debt. For example, in 2002 the distribution of these various types of debt in Denmark was as follows:³²

mia DKK 2002	public	private	total
domestic debt	465	-	
foreign debt	84	166	250 = 18% of GDP
total	549		
	= 40% of GDP (EMU-debt) ³³		

For Greenland it is impossible to obtain a correspondig overview of foreign debt because of lack of statistical data. In 2001 the home rule government had net assets of 0.7 mia DKK, and the six largest publicly owned companies had in addition to debt owed to the government a total debt of 0.9 mia DKK, namely gross debt, when current assets are deducted. Total debt of home rule

government and companies amounted to 0.2 mia DKK.³⁴ Local government had 0.5 mia DKK of debt in 2001.³⁵ Publicly owned companies had a total foreign debt of 5.7 mia DKK. Private citizens, companies and government together owed a net debt of 0.8 mia DKK to financial institutions in Denmark.³⁶

In recent years the prevailing view of the consequences of foreign debt and government debt has been markedly revised, which together with the appearance of current account surplusses explains the fading attention to the Danish current account as a problem. It is possible to identify a traditional and a modern conception.³⁷

According to the traditional point of view foreign debt is a burden for the present generation, who must pay interest on the debt or finance it by borrowing, but it is first of all a burden for future generations, who must redeem the debt by producing real goods and services for export in the future. Domestic debt is not in the same way a future problem. It is a domestic issue subject to our common political decisions in parliament. It can be manipulated by legislation, and in reality it can be eliminated by means of sufficiently strong rates of inflation. These options are not available for foreign debt. As it grows, creditors will impose more harsh conditions for further lending, and conditions will not be exclusively economic. Domestic government debt, on the contrary, is in essence only a restriction upon the internal distribution of future production, as owners of government bonds have a claim for future payments, which the rest of the population is obliged to provide by tax payments. But it stays inside the national family.

This traditional conception has given way to another, modern point of view, namely that government debt, not foreign debt is the virtual problem. Private foreign debt is considered an expression of optimisation by private citizens and companies of their profile of consumption and investments over time, which is a purely private concern. Government debt, on the contrary, is considered a problem, whether domestic or foreign, because government debt is the mirror image of government expenditure at the cost of future generations. The effect depends upon, whether

government deficits reflect public consumption or public investments and whether private investments are crowded out or not, that is, how public expenditure affects future production and growth. Government debt implies some redistribution from the young to the elderly, if owners of government bonds have a higher average age than tax payers, when debt is redeemed.

Clearly, however, there is an important difference between domestic and foreign government debt, as it is considerably easier for government to manipulate or eventually get rid of the former than the latter. In general, the traditional and the modern conception are not at variance concerning concrete effects of debt. As it is elaborated in more detail below, the difference bears upon the visual angle, the demarcation between private and common responsibility, or in other words the perception of national identity and solidarity.

3. Savings and investments

Before that, however, a variant of the modern conception is considered, namely the point of view that private debt is in fact a private concern, but that current account deficits nevertheless are a national issue and a problem, or rather a symptom of a problem, namely a symptom of low savings in society.³⁸

In national accounts savings (S) are defined as the rest, when private and government consumption (C+G) are deducted from total income from production (Y) and transfer payments (P), cf. the real balance (1) of supply and use of goods and services and the balance of payments (2):³⁹

$$(5) \quad S = I + (X - M + P) = I + BP$$

3.8	2.1	3.5	5.9	4.1	2.1	1.7
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Now it is hard work to argue against a national account identity, but in this case nevertheless necessary, because defining savings as the sum of net increases in physical capital (I) and in foreign assets ($X-M+P = BP$) is deceptive, as other types of assets are suppressed. When Denmark exhausts the North Sea oil, the value enters the real balance (1) as production. Howev-

er, a considerable part of this value is not extraction production, but rather realization of the value of the oil reserve, which ought to enter the left hand side of (1) not as production but as running through a capital in the same way as imports. Savings can be placed in other assets, in particular the following:

$$(6) \quad S = \Delta K_F + \Delta K_U + \Delta K_N + \Delta K_H + \Delta K_S$$

?	2.1	1.7	?	?	?
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- ΔK_F increase in physical capital (I)
- ΔK_U increase in foreing assets (X-M+P)
- ΔK_N increase in natural capital (oil- and fish resources, unspoiled environment)
- ΔK_H increase in human capital (education)
- ΔK_S increset in social capital.

Social capital is a capital concept constructed as a counterpart to the preceding concepts intended to express general cooperation ability or mutual trust in society. It is related to the concept of norms in sociology, and it resembles the other capital concepts by affecting production and by being used for more than one year in contrast to raw materials. Unfortunately, not much is known about how social capital is accumulated through investments; much more is known about how it can be quickly destroyed. There are other characteristical dissimilarities between the various types of capital. While physical capital depreciates and is written off, as it is used up, it is the other way round concerning human capital, which depreciates by not being used.

Attempts have been made to estimate "genuine savings" by including changes in natural capital (ΔK_N) and human capital (ΔK_H). It turns out that genuine savings are positive in Denmark, although less than uncorrected savings, and thus sustainable, if substitutability between various types of capital is assumed.⁴⁰ But is it really possible to substitue more french language lessons for less North Sea oil? And what about the singing of the larks?

The relationship between current account surplusses and savings is by no means unambiguous, and current account problems are not necessarily expressed as deficits. A surplus can also be a symptom of a savings problem. The current Danish surplus is to a large extent a reflection of the problem, that the family silver, i.e. North Sea oil, is being sold, presumably at bargain prices. Russia has an even larger problem of current account surplusses, about 5%-10% of GDP, in 2000 no less than 20%, because private "extraction capitalist" has abstained from domestic physical investments, as privatisations together with liberalisation of internal movements of goods and capital paved the way for exporting natural capital in exchange for assets abroad. Oil, gas and other raw materials now account for 80% of Russian exports and thus are even more dominant than in Soviet times. Huge resources are withdrawn from Russia as capital flight.⁴¹

4. National identity

As long as the Danish economy is considered a common concern, the balance of payments will remain a political issue, and if foreign debt increases, it will aggravate this problem, as it becomes more difficult to raise new debt to pay interest on and redeem accumulated debt. Government debt is a collective liability, but private debt is also a common problem. If private debtors can not pay, they must transfer assets like companies, week-end cottages and other property to foreign creditors. The state can do the same and sell for example state insurance companies, telecommunication companies, art collections, castles and forests abroad.

But does it at all matter, whether companies and property are owned by Danish or by foreign capitalists? That is the question. If it is uninteresting, whether Danish property, agricultural lands and companies are owned by foreigners or by Danish citizens, then foreign debt is reduced to an issue similar to the debt of local municipalities. It is not considered a problem that companies in Copenhagen are owned by shareholders living in Jutland, or that summer cottages on Bornholm are owned by people living in Copenhagen. Foreign indebtedness restricts national political sovereignty. Thus, it doubtless reduces the scope for

political decisions in Hungary and Poland, that about 70% of banks and industry is owned by foreigners.⁴²

Foreign debt disappears as a political problem, if the Danes stop thinking about Denmark as a relevant geographical and national entity for economic decision-making.

As long as Greenland's economy is considered a common concern, the balance of payments is a political issue. If the economy is perceived as a private affair, that is, it is left to private citizens to earn money, how and where they best can, then the balance of payments is irrelevant. If citizens can not make a living in Greenland, they must go bankrupt or move assets and manpower out of Greenland. And if the consequence becomes depopulation of Greenland, it is still an individual, private affair. *Sauve qui peut*.

Increasing attention to Greenland's balance of payments is a reflection of striving towards self-governance and stronger national identity. "A Greenland heading towards self-governance and a sustainable economy must to a much higher degree than now focus on possibilities for improving the balance of payments".⁴³ There is some inconsistency between this expression of stronger political community on the one hand, and the prevailing tendency towards thorough privatisation of the economy on the other hand, as maintained by politicians and by the commission concerning business development in Greenland,⁴⁴ which expresses dismantling of collective political responsibility for the economy.

In Denmark support for the modern conception and fading interest in the balance of payments must be considered a consequence of a corresponding decline of political community. Political identification, especially among young and well educated people, has changed during the 1990's. According to EU public opinion polls, in 1994 75% of Danes declared themselves as Danes rather than as Europeans; in 2000 the percentage had shrunk to 50%, and this change is so striking that it has been labelled "a silent revolution".⁴⁵

Balance of payments, Danish transfers and self-governance

The transfer payments from Denmark to Greenland are so large as compared to the total economy of Greenland, that it is impossible to predict the consequences of an annulment with any accuracy. It would entail profound adjustments. However, as illustrations of the scope of the problem some examples of calculations are shown below based upon the extremely simple model (7)-(12); it takes into account but a few macroeconomic mechanisms, but these are important and fairly stable, so that it is possible to establish at least a rough idea of parameter values and numerical magnitudes. The mechanisms taken into account are, that production creates income, that income is taxed, that after-tax income is spent on private consumption and savings, and that the various components of final demand contain various amounts of imports. More complicated and largely unknown effects concerning prices, wage rates, investment changes, adjustments of public transfer payments etc. are left out. The model describes changes (Δ)

$$\begin{aligned}(7) \quad \Delta Y &= \Delta C + \Delta I + \Delta G + \Delta X - \Delta M \\(8) \quad \Delta C &= .80 (\Delta Y + \Delta TR - \Delta T) \\(9) \quad \Delta T &= .44 \Delta Y \\(10) \quad \Delta M &= .48 \Delta C + .51 \Delta I + .22 \Delta G + .38 \Delta X \\(11) \quad \Delta BP &= \Delta X - \Delta M + \Delta P \\(12) \quad \Delta GS &= \Delta T + \Delta P - \Delta TR - \Delta G - \Delta I_G\end{aligned}$$

Given the values of changes in exogenous variables: $\Delta I (= \Delta I_p + \Delta I_g)$, ΔG , ΔX , ΔTR , ΔP , and parameter values: $c=.80$, $t=.44$, $m_c=.48$, $m_I=.51$, $m_G=.22$, $m_X=.38$, the six equations determine the values of six endogenous variables: ΔY , ΔC , ΔT , ΔM , ΔBP , ΔGS .

The four equations (7)-(10) can be solved independently of the two accounting identities (11)-(12), which duplicate (2)-(3) above.

The national income accounts identity (7), cf. (1) above, is supplemented by three behavioral equations (8)-(10), describing reactions of economic agents. Consumption (ΔC) is a linear

function of disposable private income, cf. equation (8), namely income from production (ΔY) and government transfer payments (ΔTR) after deduction of taxes (ΔT); 80% of disposable income is spent on private consumption, and 20% is saved. According to equation (9) transfer payments (ΔTR) are not taxed, and 44% of production income (ΔY) is collected as taxes (ΔT). Import changes (ΔM) are computed in equation (10), and the parameter values are the import shares of the various types of final demand found in the input-output table for 2004, cf. the discussion of (4) above.

Numerical parameter value are subject to debate. The tax rate of 44% in (9) corresponds to current actual tax rates.⁴⁶ But in a similar computational exercise Lars Lund argued for a marginal rate of consumption of .90 as compared to .80 in (8), and a marginal tax rate of .27 as compared to .44 in (9).⁴⁷ It could also be argued that the tax rate might be still higher, as transfer payments presumably vary with income as a decreasing function.⁴⁸

As an example of how to solve the equations it is shown in details how the effect upon GDP (ΔY) following a change in public consumption (ΔG), when all other exogenous variables equal zero, is computed; to solve the equations means to find the endogenous variables (ΔY) as a function of known exogenous variables (ΔG) and parameter values:

$$\begin{aligned}\Delta Y &= \Delta C + \Delta G - \Delta M \\ &= \Delta C + \Delta G - m_c \Delta C - m_g \Delta G \\ &= (1 - m_c) c (\Delta Y - t \Delta Y) - m_g \Delta G + \Delta G \\ &= c(1 - m_c)(1 - t) \Delta Y + (1 - m_g) \Delta G \\ &= \frac{(1 - m_g)}{1 - c(1 - m_c)(1 - t)} \Delta G\end{aligned}$$

Equations (7)-(10) are of course a strongly simplified model of the economy, but introducing more complex mechanisms would also introduce severe arbitrariness, as little is known about numerical values and stability of parameters of more complex mechanisms. Equations (7)-(10) corresponds to essential equations in macroeconomic models like SMEC and ADAM used in Denmark, and despite their simplicity they give comparable results. For exam-

ple the parameter values $c = .75$ (marginal rate of consumption), $t = .55$ (marginal tax rate), $m_g = .07$ and $m_c = .25$ (marginal import shares of government and private consumption) give:

$$\Delta Y = 1.25 \Delta G;$$

The coefficient 1.25 describes the effect of a change in an exogenous variable (ΔG) upon an endogenous variable (ΔY), a so-called *multiplier*. Thus, if public consumption is increased by 1 mio DKK, production will increase by 1.25 mio DKK, because the initial production increase causes income (and savings, taxes and imports) and thereby private consumption demand to increase. This multiplier is not quite wrong, as compared to the corresponding multiplier in ADAM of 1.10 after two years.⁴⁹

The solution of (7)-(10) with respect to ΔY , when all exogenous variables change, becomes:

$$(13) \quad \Delta Y = .639 \Delta I + 1.017 \Delta G + .542 \Delta TR + .808 \Delta X$$

The multiplier for government expenditure (ΔG) of 1.017 is relatively low as compared to ADAM's multiplier of 1.10 for Denmark, and extremely low as compared to multipliers used by Lars Lund and Martin Paldam of 1.58 and 1.50, respectively.⁵⁰ But the low multiplier is the more realistic one, because import shares are higher in Greenland than in Denmark, so that a larger share of the increase in demand, which is brought about by increased government consumption, will be directed towards imports rather than towards domestic production. The low multiplier for investments (.639) is due to the very high share of imports. The multiplier for transfer payments becomes small (.542) because a certain, small amount is used for savings and the rest for private consumption, in which the share of imports is higher than in government consumption. If the tax rate is increased, multipliers become even smaller.

If all these assumptions are accepted, it is possible to compute the immediate effects of annulment of the annual block grant from Denmark of 3.1 mia DKK.

Example 1: The block grant is reduced to zero.

Exogenous changes: $\Delta P = -3.1$, $\Delta G = -2.2$, $\Delta I = -0.2$, $\Delta TR = -0.7$. The block grant enters Greenland through the public budget, and the immediate effect is that public spending must be cut by the same amount as the block grant (3.1). It is further assumed that the cuts are distributed proportionally on public consumption (G), public investments (I_G) and transfer payments (TR).

Without the block grant the real balance (1), the current account (2) and the government surplus (3) becomes:

$$\begin{array}{rcccccc}
 (14) & Y & + & M & = & C & + & I & + & G & + & X \\
 & 7.9 & & 4.4 & & 3.5 & & 1.9 & & 3.4 & & 3.5 \\
 & -25\% & & -25\% & & -34\% & & -10\% & & -39\% & &
 \end{array}$$

$$\begin{array}{rcccccc}
 (15) & BB & = & X & - & M & + & P & ; & & \Delta BB = -1.6 \\
 & 0.1 & & 3.5 & & 4.4 & & 1.0 & & &
 \end{array}$$

$$\begin{array}{rcccccc}
 (16) & GS & = & T & + & P & - & TR & - & G & - & I_G & ; & \Delta GS = -1.2 \\
 & -0.8 & & 3.0 & & 1.0 & & 1.0 & & 3.4 & & 0.4 & &
 \end{array}$$

According to these computations production and imports will decline by 25%, private consumption by 34%, investment by 10% and public consumption by 39%, while exports are assumed to be unchanged. The current account surplus is reduced from 16% of GDP to 1% of GDP, and the government surplus from 4% to -8% of GDP. The effects are dramatic and in this respect without doubt realistic.

Is it possible for the government by adjusting public consumption (G) and the tax rate (t) to keep the current account and the budget surplus constant? No, it is impossible, as illustrated in the next example.

Example 2: The block grant is reduced to zero, and the current account and the budget surplus are kept constant by adjusting public consumption and tax rates.

Exogenous changes: $\Delta P = -3.1$, $\Delta I = -0.2$, $\Delta TR = -0.7$.

Side conditions: $\Delta BB = \Delta GS = 0$.

The two side conditions are added to the system (7)-(10), which is solved for six unknown variables: ΔY , ΔC , ΔT , ΔM , ΔG and Δt , as ΔG and the change of the tax rate (Δt) are now unknown variables. Although the equations are non-linear in Δt and ΔY , it turns out that they are not difficult to solve, and the totally absurd solution becomes:

$$(17) \quad \begin{array}{rcccccc} Y & + & M & = & C & + & I & + & G & + & X \\ 4.0 & & 2.8 & & 5.3 & & 1.9 & & -3.9 & & 3.5 \\ -61\% & & -53\% & & 0\% & & -10\% & & -170\% & & \end{array}$$

with a negative tax rate of $-.66$; only in this absurd situation the current account and the budget surplus will not deteriorate.

Even if all public expenditures on public consumption, public investment and transfer payments are cut to zero and tax rates increased to 75%, the current account deteriorates by 0.3 mia DKK, although the government surplus improves by 0.3 mia DKK under these assumptions. It is very difficult to imagine, how Greenland's economy could function without the block grant, and it is difficult to imagine, how the Commission on Self-governance could conclude, that "without Danish transfers disposable incomes in Greenland would be 25% below the current level".⁵¹

The only possibility of doing without the Danish block grant is by means of increased exports.

Example 3: Required export increases and tax rate adjustments for neutralizing annulment of the block grant with unchanged current account and budget surplus.

Exogenous changes: $\Delta P = -3.1$.

Side conditions: $\Delta BB = \Delta GS = 0$.

The two side conditions are added to the system (7)-(10), which is solved for six unknown variables: ΔY , ΔC , ΔT , ΔM , ΔX and Δt , as ΔX and the change of the tax rate (Δt) are now unknown variables. Again the equations are non-linear in Δt and ΔY , but not difficult to solve:

$$\begin{array}{rcccccc}
 (18) & Y & + & M & = & C & + & I & + & G & + & X \\
 & 13.7 & & 7.8 & & 5.3 & & 2.1 & & 5.6 & & 8.5 \\
 & 29\% & & 32\% & & 0\% & & 0\% & & 0\% & & 143\%
 \end{array}$$

$$\begin{array}{rcccccc}
 (19) & BB & = & X & - & M & + & P & ; & & \Delta BB = 0.0 \\
 & 1.7 & & 8.5 & & 7.8 & & 1.0 & & &
 \end{array}$$

$$\begin{array}{rcccccc}
 (20) & GS & = & T & + & P & - & TR & - & G & - & I_G & ; & \Delta GS = 0.0 \\
 & 0.4 & & 7.3 & & 1.0 & & 1.7 & & 5.6 & & 0.6 & &
 \end{array}$$

The tax rate required for this outcome is $t = .57$, so the tax rate must be increased from .44 to .57. This is what is needed: exports must increase by 143% and domestic production by 29%; private consumption does not increase, and investments are constant by assumption. To obtain room for increases in consumption and investments, export increases in excess of 143% are necessary.

Are equations (18)-(20) a realistic scenario for Greenland's economic future? Firstly, productivity increases are certainly necessary. If productivity increases take place in the non-service sector of the economy, roughly 50% of production,⁵² but not in services, non-service production will have to increase from 5.3 mia DKK in 2006, cf. (1) to 8.4 mia DKK, cf. (18). With an annual productivity growth rate of 2% this growth of 58% can be achieved in 23 years. An annual productivity increase of 2% is the basic assumption for the rather optimistic economic forecasts made by the Commission for Self-governance, according to which it is possible to reduce the block grant by 2% annually and still obtain continued growth of private and public consumption.⁵³

Secondly, increased export production must also be sold abroad. The Commission on Self-governance assumes that "exports are determined so that the market for goods is balanced"; imports are determined as a share of private consumption and investments only, but not government consumption or exports; apparently import contents are assumed to be rather low, 29% according to estimated national account data.⁵⁴ The Commission mentions potential problems because of the natural resource dependence og

Greenland's economy, but this is declared compatible with continued economic growth.⁵⁵ Besides this and some general remarks on the beneficial effects of improved education, no details are disclosed concerning how more concretely production can be increased in Greenland and how exports can be sold abroad.

It is widely hoped in Greenland and Denmark, indeed widely expected, that new natural resource discoveries will bring prosperity for Greenland, and the law on self-governance, which takes effect on the 21st of June 2009, stipulates in details in §§ 7-10 how future resource income should reduce the Danish block grant.⁵⁶ Future resource rent payments to Greenland could exactly replace the Danish block grant - if they materialize.

The figures above do not support the optimistic conclusions of the Commission on Self-governance. Neither do they support the conclusion of report on monetary flows of 2003, "that import and exports are approximately the same size, [so that the block grant] is an acquisition of assets, [and that] Greenland has these amounts at its disposal for public or private consumption, investments etc."⁵⁷ Without the block grant, the current account, production and living standards would deteriorate massively. The current account would become a truly real, economic problem, not a purely statistical one. If the government tries to compensate for collapsing production and income by means of public expenditures, explosively escalating current account deficits would soon force living standards down to an unacceptable low level in Greenland.

Preserving living standards without the block grant would require tremendous growth of production and exports. It is a myth, that the block grant and other transfer payments flow back to Denmark and therefore in reality is an advantage for Denmark.⁵⁸ When transfers flow to Greenland, there is no corresponding flow of goods and services to Denmark. When they flow back to Denmark, a corresponding flow of goods, services and assets go the opposite way. The economic reality is, that transfers from Denmark supply purchasing power for people living in Greenland, who can acquire consumption and asset goods in Denmark for free.⁵⁹

In this regard it is true, as the Commission on business development in Greenland wrote: "Without business development - no welfare development".⁶⁰ But otherwise it is mistaken. It is not at all impossible. In Denmark many groups of the population and many islands and geographical areas carry on with a deficit on their current account and receive subventions. Nobody expects, that for example Bornholm or Årø necessarily should be profitable and able to do without the community with the rest of Denmark. The general ambition for economic policy in Greenland is probably not to make Greenland profitable and self-sustaining; there are other objectives including cultural and social ones. The challenge for economic policy in Greenland has been to create economic prosperity, nota bene subject to the condition, that living standards in Greenland should be fairly comparable with levels in Denmark, in cities as well as in villages. From a purely economic perspective Greenland could be left at the mercy of free, private markets and "cost compatible prices"⁶¹ and equally cost compatible wages, and the end result would become poverty in Greenland and depulation of large areas.⁶²

Evidently, mutual political dependence and solidarity has been perceived as a precondition for economic mutual connexion. Prime minister Anker Jørgensen's notorious "dice statement" in 1976 expresses this political basic principle: "There is nothing to cast dice for - if Greenland wants property rights of subsoil resources, then the consequences must also be accepted, and then you must declare that you want to cut the ties with Denmark."⁶³

Political and economic dependence and solidarity can be perceived as an asset or as a liability. The latter is increasingly prevailing. The law of self-governance complies with Greenland's intentions of "liberating the country from dependence upon Denmark"⁶⁴ and of "increasing self-governance, which are compatible with Danish wishes to reduce the annual block grant to Greenland".⁶⁵ It has been on the agenda for several years, that "principles for gradual reduction of the block grant can be negotiated with the purpose of making Greenland less dependent upon the block grant, but in consideration for the solidarity between the two nations".⁶⁶ The law on self-governance greazes the block

grant at the level of 2007 in real terms,⁶⁷ so that this is no longer subject to negotiations, a big step away from economic and political community.

Strong forces weaken the ties of national community. In Greenland the change of course away from economic and political dependence is in itself an objective for striving towards stronger national identity in Greenland and attainment of political and economic self-governance. In Denmark narrow economic motives are supported by the changes of basic political principles, in which solidarity with Denmark and the Nordic countries is replaced by a more European, global and private-economic orientation.

Notes:

1. Bech, 1994; Lund 2002, 2003a, 2003b.
2. Pengestrømme, 2003:47; Bech, 1994.
3. Lund, 2003b.
4. Pengestrømme, 2003.
5. Sørensen, 2003:105; jf. Benchmarkingudvalget, 2003:21-24.
6. Clemmesen, 1991.
7. Niels Thygesen, 2000.
8. Ole Bernt Henriksen, 1990.
9. Peter Birch Sørensen, 1999:360.
10. Grønland 2008:261; more about assumptions and methods below; estimates for 2001 are reported in Aage, 2004:8-10.
11. Grønlands Statistik, 2008a:7.
12. Grønland 2008:275,305-310; Grønlandsk-dansk Selvstyrekommission, 2008:170.
13. Aage, 2004:9-10; Grønlandsk-dansk Selvstyrekommission, 2008:493; Grønland 2003:216,220; Benchmarkingudvalget, 2003:23.
14. Comparisons are, however, difficult, among other things because VAT is collected in Denmark, but not in Greenland.
15. Pengestrømme, 2003:47,50; Aage, 2004:9.
16. Grønland 2008:261,275.
17. Grønland 2008:305-310.
18. Grønlands Statistik, 2008a:7; 2008; Grønland 2008:287.
19. Data provided by Statistics Greenland; Thage, 2009:15.
20. Aage, 2004:11; Grønlands Statistik, 1998; Grønland 2008:271.
21. Grønland 2008:281,285; in figure 11.5 on p 281 the current level of imports is stated as about 32% of GDP in contradiction with the 55% on p 285. The explanation for this discrepancy probably is, that the 55% is based upon the recent balance of payments statistics, and the 32% upon unrevised data; 32% imports of GDP corresponds to an implausibly low total import share of final demand of .24, lower than the share in Denmark of .27, cf. Grønland 2008:285-286; Grønland 2003:211,239,240; Aage, 2004:11. Part of the explanation could also be changes of methods of statistical accounting, as national accounting was transferred from Statistics Denmark to Statistics Greenland in 1986, and until recently it was mostly based upon income statistics, cf. Grønland 2003:281.
22. Data provided by Statistics Greenland; Thage, 2009:15,17; Danielsen et al., 1998; Grønland 2008:271; Lund, 2002; Sørensen, 1993:70-71.

23. Aage, 2004:11-12.
24. Grønland 2008:261; data provided by Statistics Greenland; Thage, 2009:8.
25. Statistisk Tiårsoversigt, 1971:48,80; 1981:56,113; 1991:84; 2003:109; 2008:157.
26. Statistisk Tiårsoversigt, 1994:92,96; 2001:103,108.
27. DØR, 1996:45,75,79,83.
28. Arbejderbevægelsens Erhvervsråd, 1991; Clemmesen, 1991.
29. Vastrup, 1999:88,91, 2002:19; Birch Sørensen, 1999:365.
30. *The Economist*, 13 December 2008, pp 75-77.
31. *The Economist*, 28 February 2009, pp 26-28.
32. Statistisk Tiårsoversigt, 2001:109,150; 2003:109,154.
33. cf. Petersen (2001), who describes various definitions of various types of debt and recent improvements in accounting principles.
34. DRUG, 2003:40,52.
35. Grønland, 2003:226-232; DRUG, 2003:54.
36. Pengestrømme, 2003:61-65,77.
37. Haagen Pedersen, 1999:72-73; Petersen, 2001:26; Vastrup, 1999.
38. Birch Sørensen, 1999:363,365.
39. cf. Lund, 2003a:92; Vastrup, 1999:86.
40. DØR, 1998:208,224,228.
41. Aage, 2004.
42. K.Z. Poznanski i *Journal of Economic Literature* 40 (June 2003, No. 2):620.
43. Pengestrømme, 2003:72,78.
44. Fællesudvalget, 2003; Aage, 2003.
45. Goul Andersen, 2000:113.
46. Grønland, 2008:301,315.
47. Lund, 2002:9,13.
48. Lund, 2002:11.
49. ADAM, 1991:220.
50. Lund, 2002:14; Paldam, 1994:31-33.
51. Grønlandsk-dansk selvstyrekommision, 2008:64.
52. The input-output table for 2004, cf. Thage, 2009:12; government consumption, G, is mainly services and constitutes also roughly 50% of GDP, cf. (1).
53. Grønlandsk-dansk selvstyrekommision, 2008:459-465,489-519.
54. Grønlandsk-dansk selvstyrekommision, 2008:516,493.

55. Grønlandsk-dansk selvstyrekommision, 2008:465,509-510.
56. Grønlandsk-dansk selvstyrekommision, 2008:105-106.
57. Pengestrømme, 2003:67.
58. Winther, 2003.
59. Lund, 2003c.
60. Fællesudvalget, 2003: the title of the report.
61. Fællesudvalget, 2003:61.
62. Aage, 2003.
63. Prime minister Anker Jørgensen i Grønlands Radio 1976, quoted by Winther, 1997:1; jf. Breinholt Larsen, 1997; Motzfeldt, 2000; Lidegaard, 1991:221.
64. Pengestrømme, 2003:76.
65. Grønlands Erhvervsråd, 2002:9.
66. Negotiations concerning the block grant in 2002 and 2003. Benchmarkingudvalget, 2003:2; Grønland, 2003:480.
67. Grønlandsk-dansk selvstyrekommision, 2008:105.169-173.

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