

Is energy taxation a source of long-term fiscal revenue?

A closer look at Swedish data

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The dual objectives of energy taxation

Environmental objective:
change behaviour to
eliminate inefficiency created
by environmental damage
(e.g. reduce carbon
emissions)

Fiscal objective:
raise public revenues,
without affecting or distorting
producer or consumer
behaviour



Gradually eroding tax base and
therefore limited revenue potential?



An inverse relationship?

Fuel duty taxes face £170bn hit from electric cars

Think-tank calls for road tolls to plug gap in government revenues



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Financial Times, 26 June 2017

- Electrification “threatening” fiscal tax revenues
- Can environmental progress be a fiscal problem?

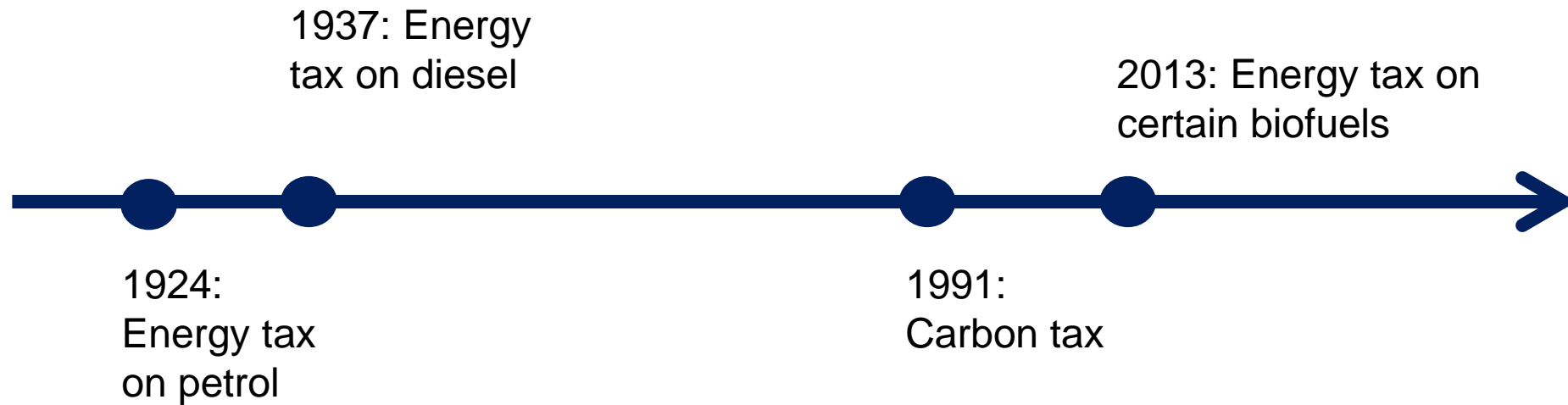


Focus on motor fuel taxation

- Importance of motor fuels from environmental perspective
- “High-end” of the oil barrel and therefore difficult to replace
- Importance of motor fuel taxes as source of fiscal revenue
- Relatively broad and inelastic tax base



Swedish motor fuel taxation



Motor fuel tax rates in 2016

Table 1 Motor fuel tax rates, 2016

SEK (US\$) per litre

| Fuel | Energy tax | Carbon tax | Total fuel tax |
|-------------------------------|-------------|-------------|----------------|
| Petrol (MK1) | 3.72 (0.44) | 2,59 (0,30) | 6,31 (0,74) |
| Diesel (MK1) | 2.36 (0,28) | 3,20 (0,37) | 5,56 (0,65) |
| Low-blended ethanol | 0.96 (0.11) | 0 | 0.96 (0.11) |
| Low-blended FAME | 2.12 (0.25) | 0 | 2.12 (0.25) |
| High-blended FAME (B100) | 1.15 (0.13) | 0 | 1.15 (0.13) |
| High-blended ethanol (in E85) | 0.99 (0.12) | 0 | 0.99 (0.12) |
| HVO | 0 | 0 | 0 |

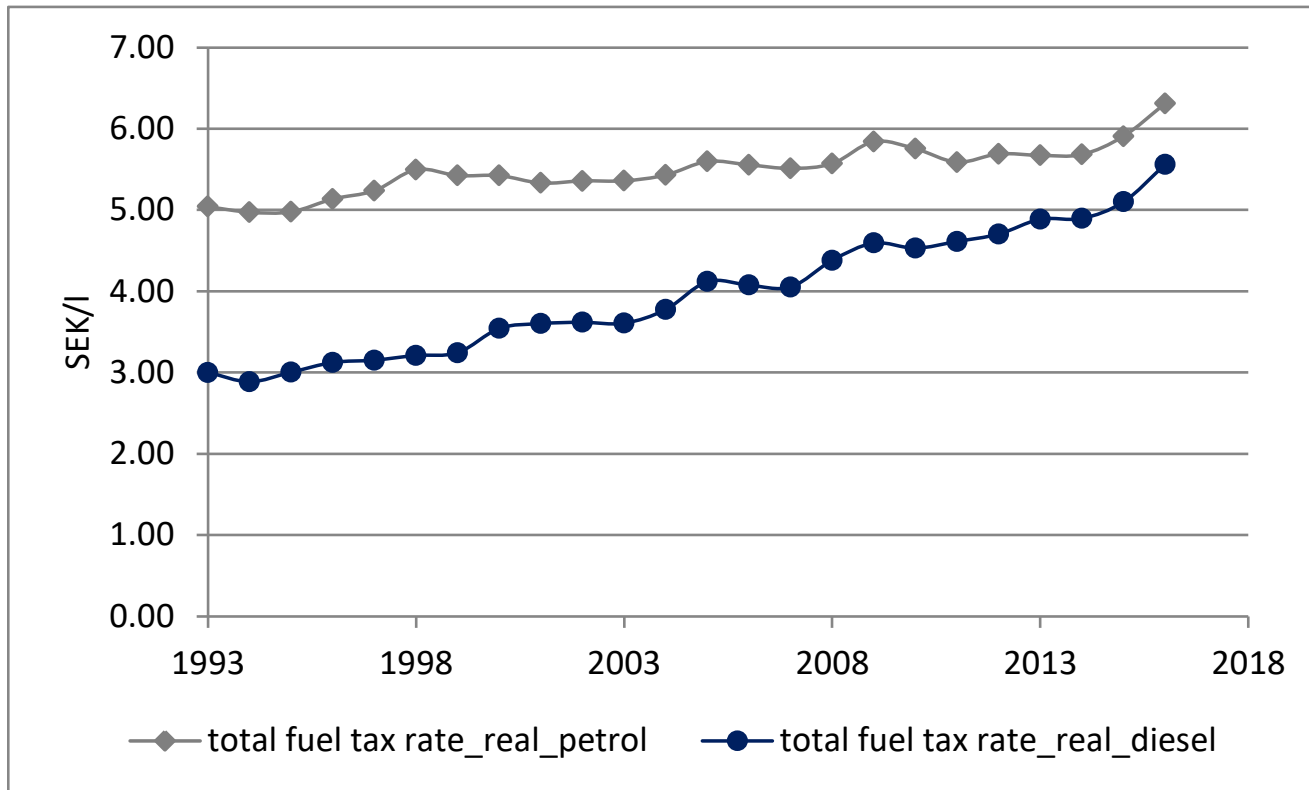
Note: Excluding VAT and according to tax rules in 2016. Tax rates on biofuel refer to biomass-based component. Fossil components in e.g. E85 are subject to taxation. Currency conversion based on exchange rate 3 October 2016, 8.54 SEK per USD. Diesel fuel used in forestry and agriculture is granted certain tax reductions. MK1 = Swedish Environmental Class 1. HVO = Hydrogenated Vegetable Oils, FAME = Fatty Acid Methyl Esters.

Source: Swedish Ministry of Finance and Statistics Sweden.



Tax rates gradually increased 1993-2016

Figure 1. Total fuel tax rates (real) on petrol and diesel, 1993-2016



- Both energy and carbon tax rates have been increased gradually over time, both in nominal and real terms

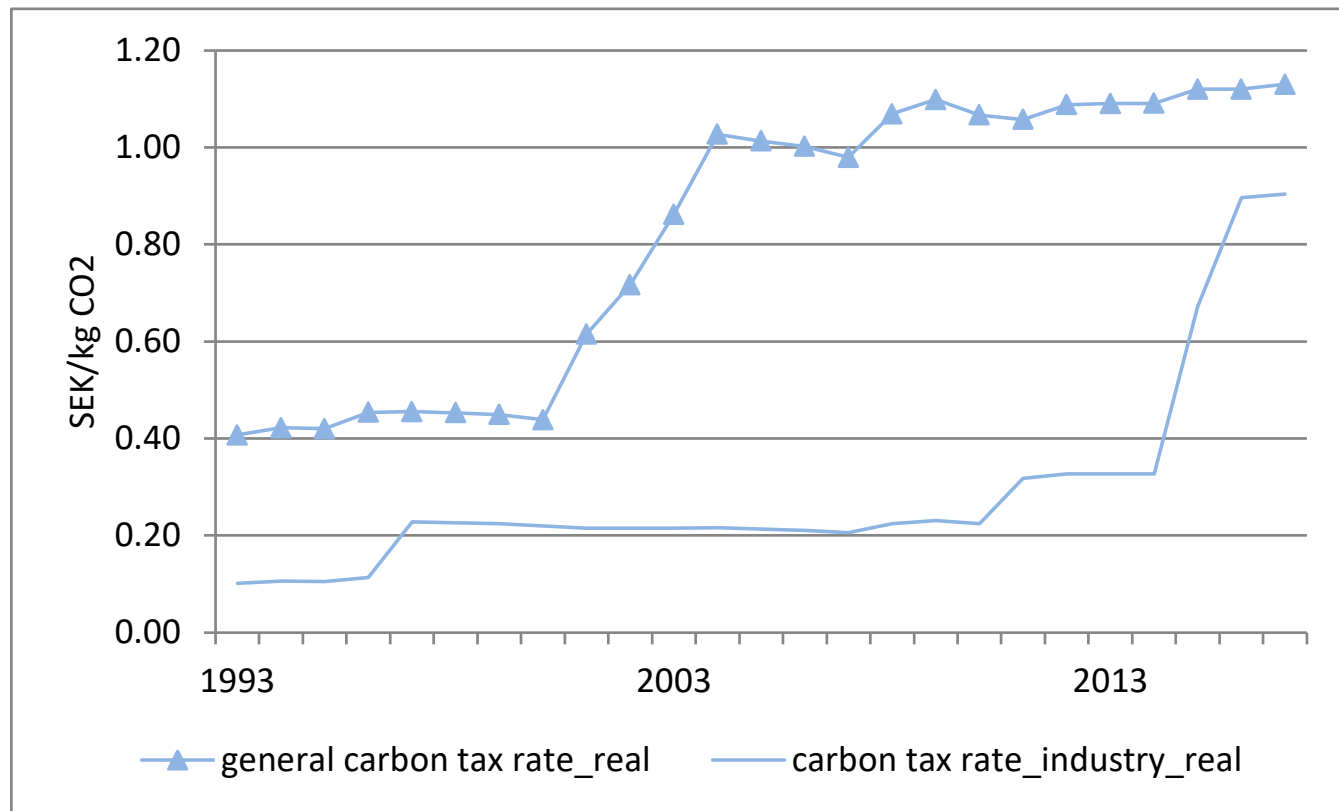
Note: Tax excluding VAT. Real prices in 2016.

Source: Swedish Ministry of Finance



General carbon tax rate

Figure 1. General carbon tax rate (real) per kilogram carbon emissions, 1993-2017



Note: Tax excluding VAT.

Source: Swedish Ministry of Finance

- In 2016, general carbon tax rate of US\$132 per tonne fossil carbon
- Industry pays reduced rates (2018 full carbon tax)
- Since 2008 major industries part of EU Emissions Trading Scheme (EU ETS) exempt from carbon taxation to avoid double regulation



Environmental objective to induce behavioural change

- Internalising negative externalities
- Increasing the price of fuel leads to reduced fuel consumption (to the extent that fuel is a normal good)
- Behavioural effects of increased fuel prices may differ depending on time horizon



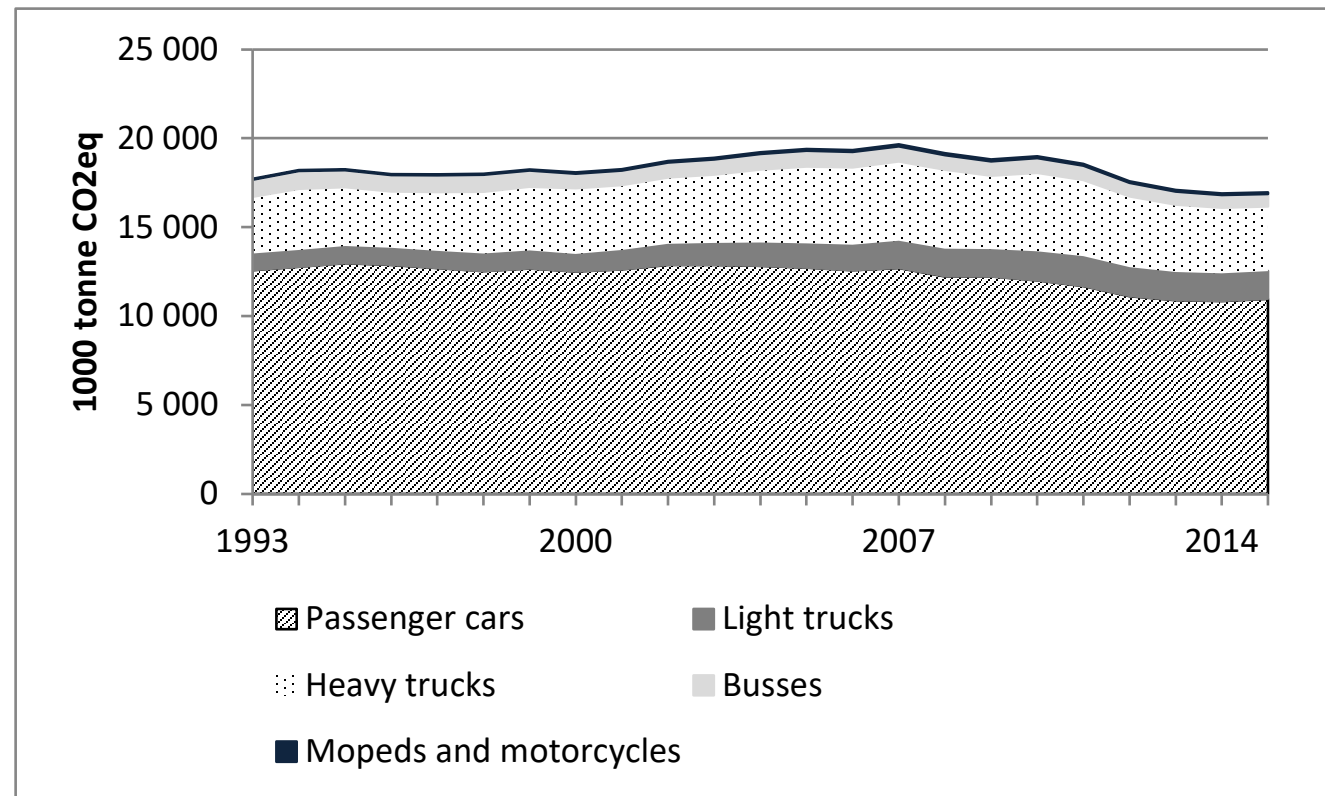
Role of transport

- Roughly one third of green-house gas (GHG) emissions from transport sector
- Road transport responsible for around 98 percent



Emissions mainly from passenger cars

Figure 1. GHG emissions from road transport by mode of transport, 1993-2015



- Passenger cars and heavy trucks responsible for main part of emissions.

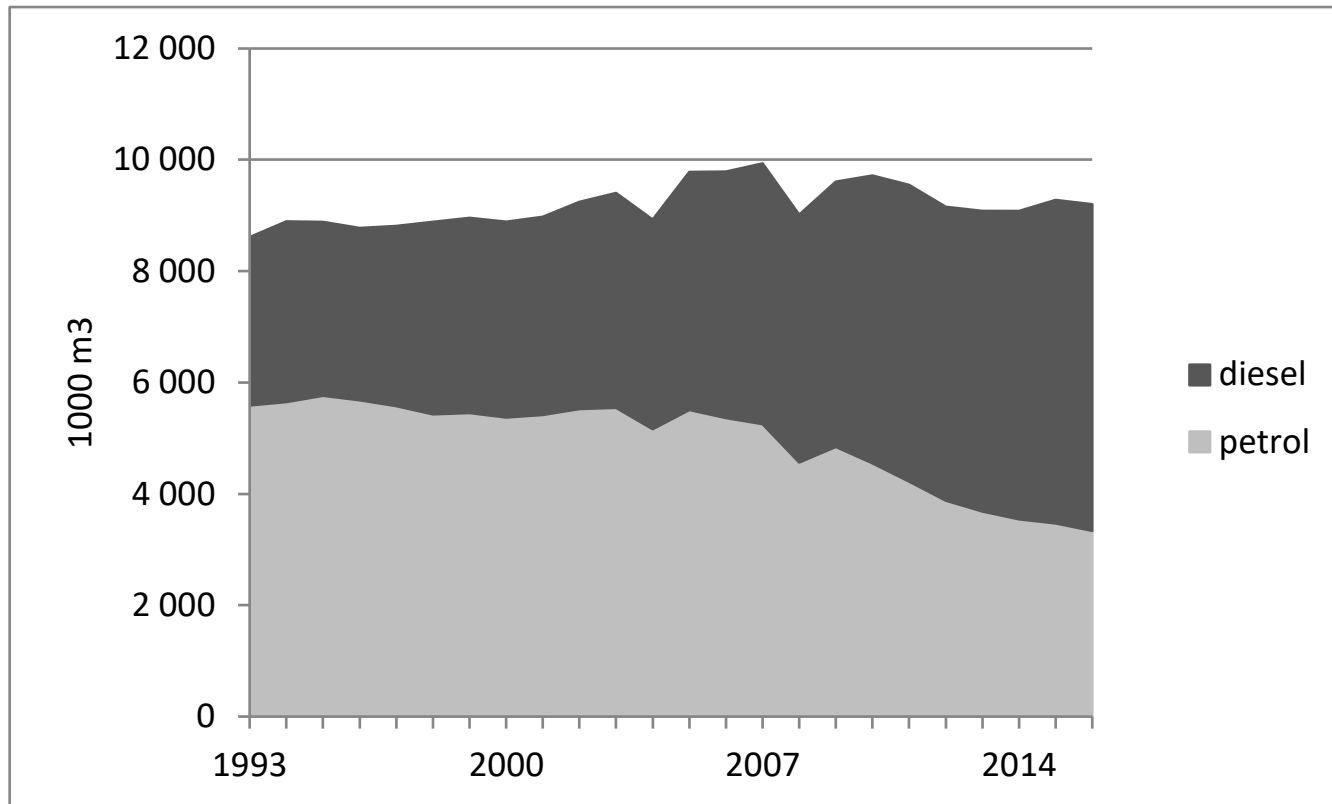
Note: Carbon dioxide equivalent (CO₂eq) is a measure of GHG emissions based on global warming potential.

Source: Statistics Sweden



From petrol to diesel to...

Figure 1. Volume petrol and diesel fuel, 1993-2016



- Clear shift towards increasing use of diesel
- Total volume of fossil motor fuel remains relatively constant, but a declining share of total fuel use

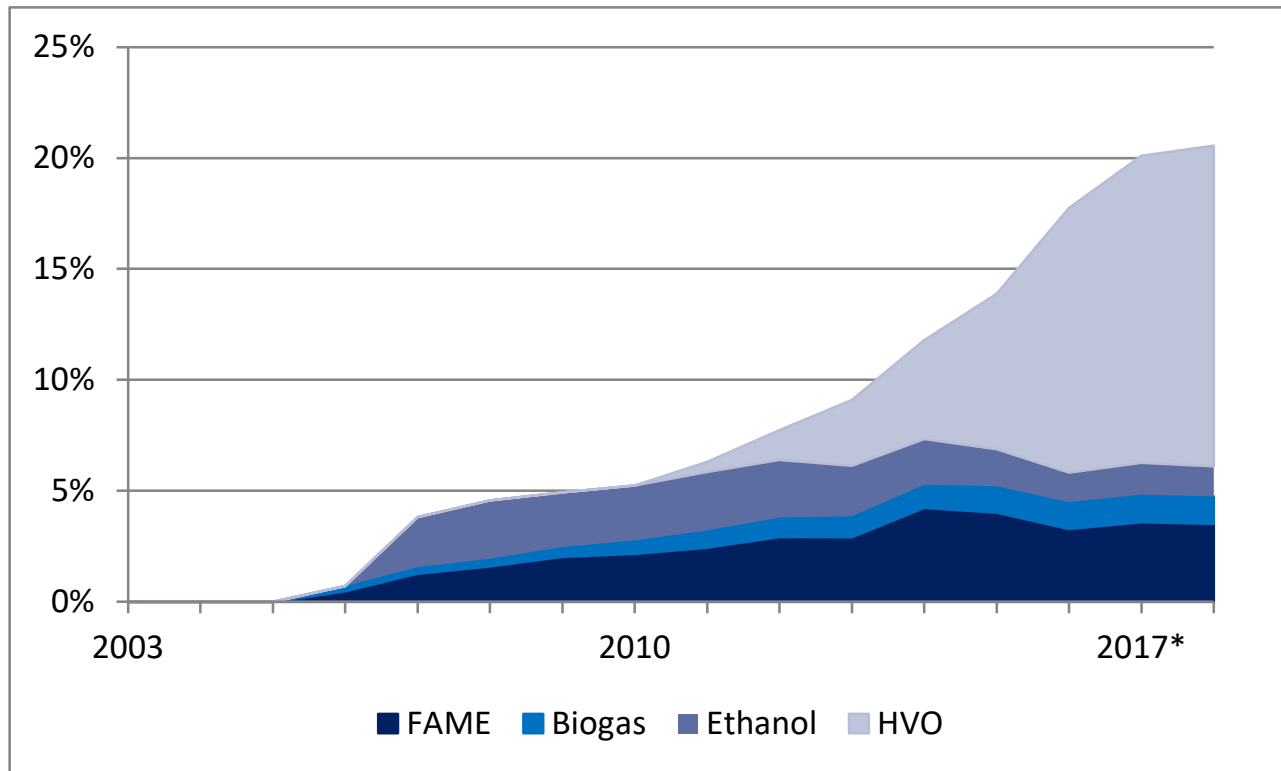
Note: Reported fuel volume made available for use.

Source: Swedish Petroleum and Biofuel Institute (SPBI)



...biofuels?

Figure 1. Share of biofuels in the transport sector, 2003-2018*



Note: *Forecast for 2017-2018, which only takes into account current policy. Share in terms of energy content. Including both high- and low-blended biofuels. HVO = Hydrogenated Vegetable Oils, FAME = Fatty Acid Methyl Esters.
Source: Swedish Energy Agency (SEA) and own calculations.

- Share of biofuels in transport sector steadily increasing since around 2006
- Electrification still limited. In 2016, electric vehicles (incl. hybrids) accounted for around 1.7 percent of passenger cars in traffic (around 7 percent of new registrations)

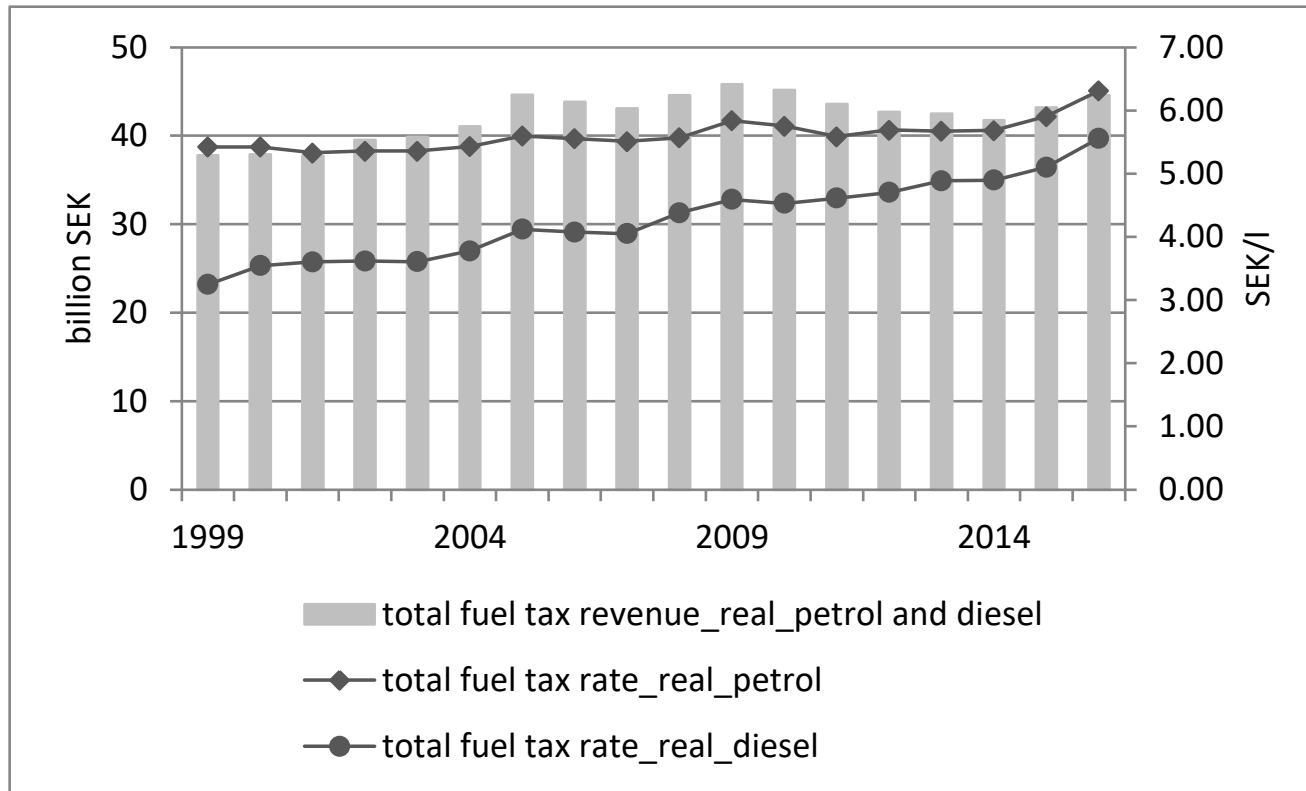
Fiscal objective of stable tax revenue flows

- In 2016, around US\$ 5.6 billion from fuel taxes on petrol and diesel (roughly half of total environmental tax revenues and three percent of total tax revenues)
- At the same time, environmental objective to curb consumption of fossil fuels
- Stability and predictability of revenue flows?



Stable total motor fuel tax revenue flows

Figure 1. Total fuel tax revenues and tax rates (real), 1999-2016

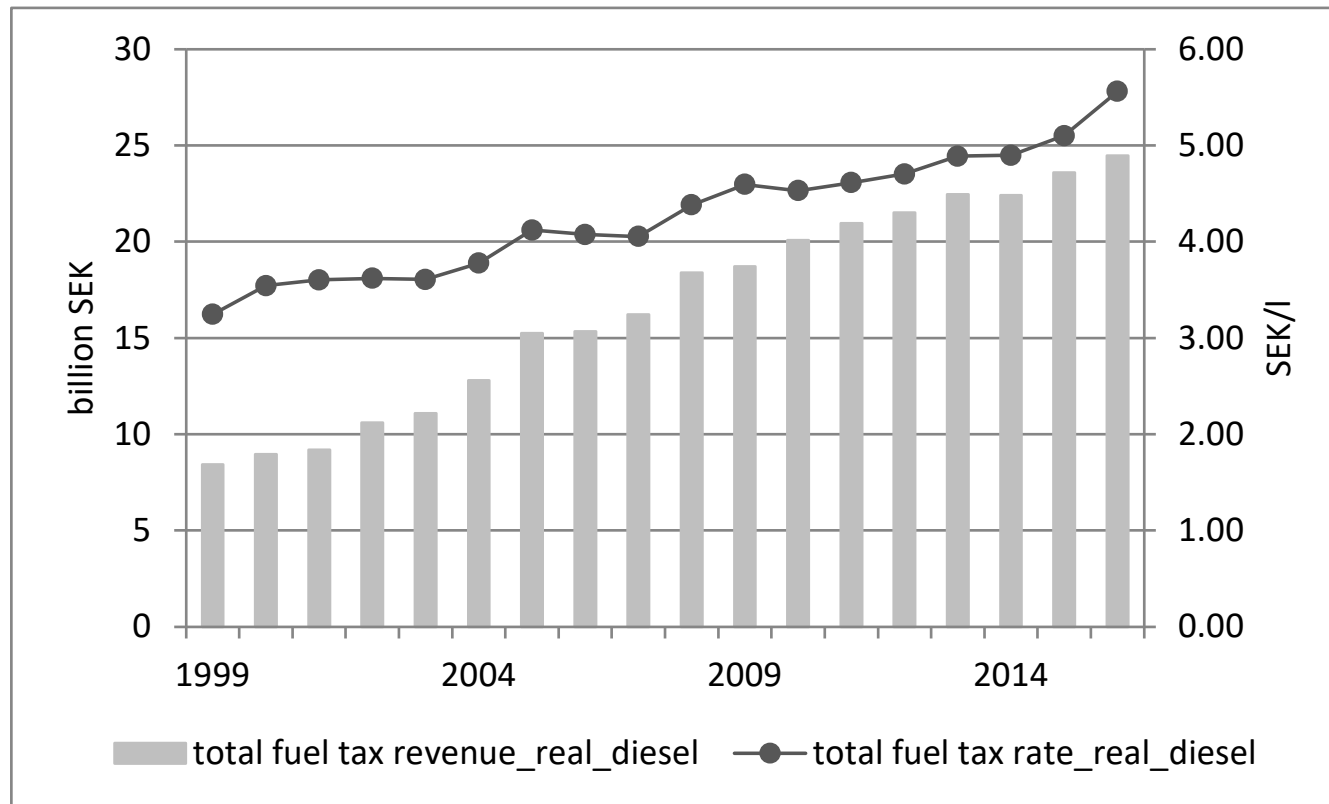


Note: Taxes excluding VAT. Real prices in 2016. Tax revenues have been calculated using fuel tax rates and energy use data.

Source: Swedish Ministry of Finance, SEA and own calculations

Increasing fuel tax revenues from diesel

Figure 1. Total fuel tax revenues and tax rates (real) from diesel, 1999-2016



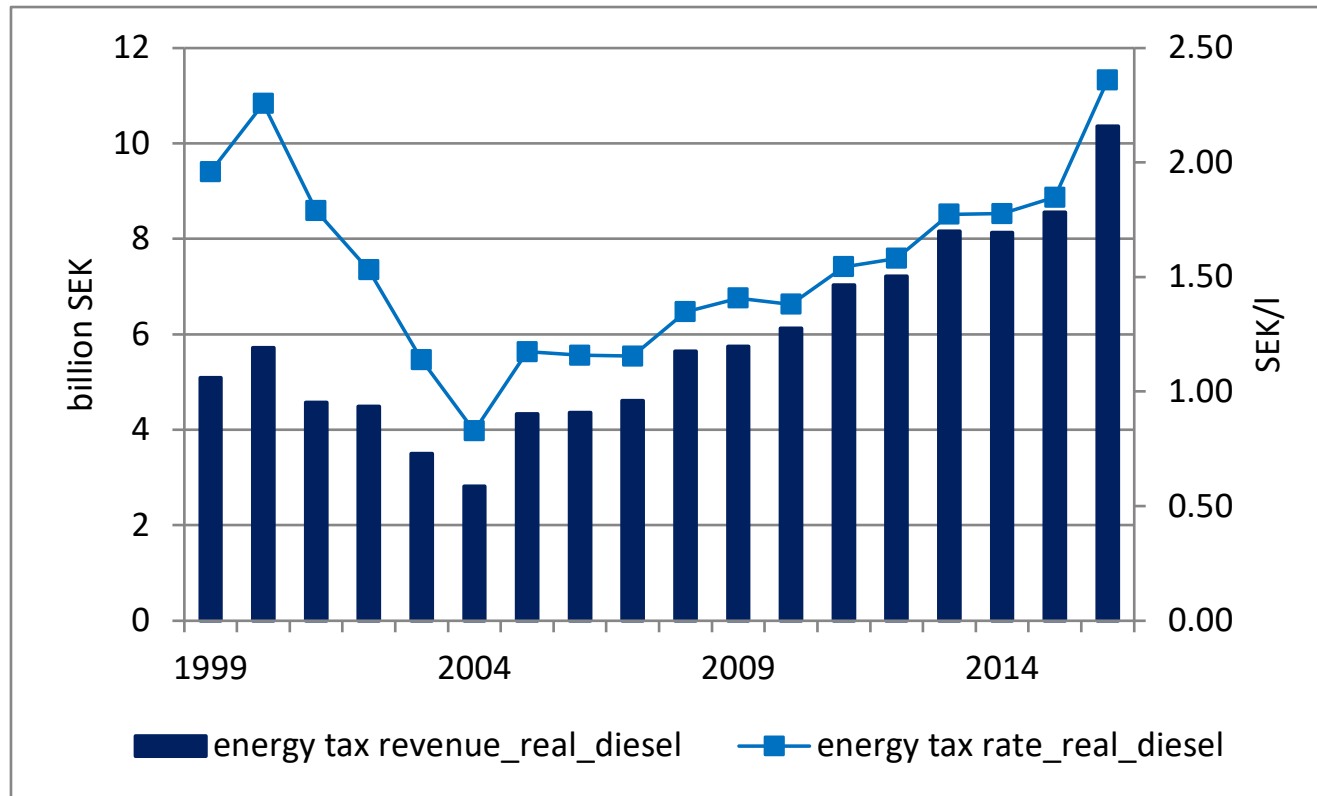
Note: Taxes excluding VAT. Real prices in 2016. Tax revenues have been calculated using fuel tax rates and energy use data.

Source: Swedish Ministry of Finance, SEA and own calculations



...mainly driven by energy tax revenues

Figure 1. Energy tax revenues and tax rates (real) from diesel, 1999-2016

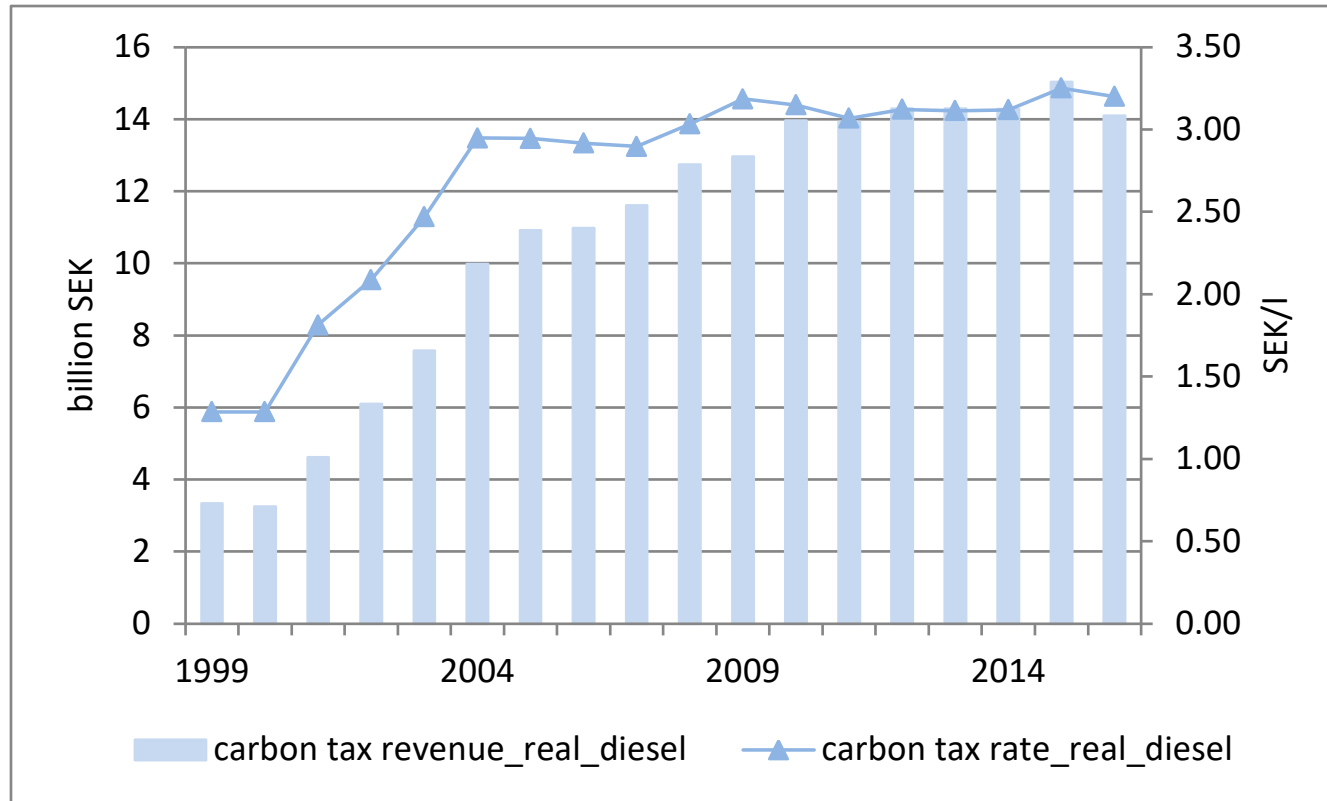


Note: Taxes excluding VAT. Real prices in 2016. Tax revenues have been calculated using fuel tax rates and energy use data.

Source: Swedish Ministry of Finance, SEA and own calculations

...less so by carbon tax revenues

Figure 1. Carbon tax revenues and tax rates (real) from diesel, 1999-2016

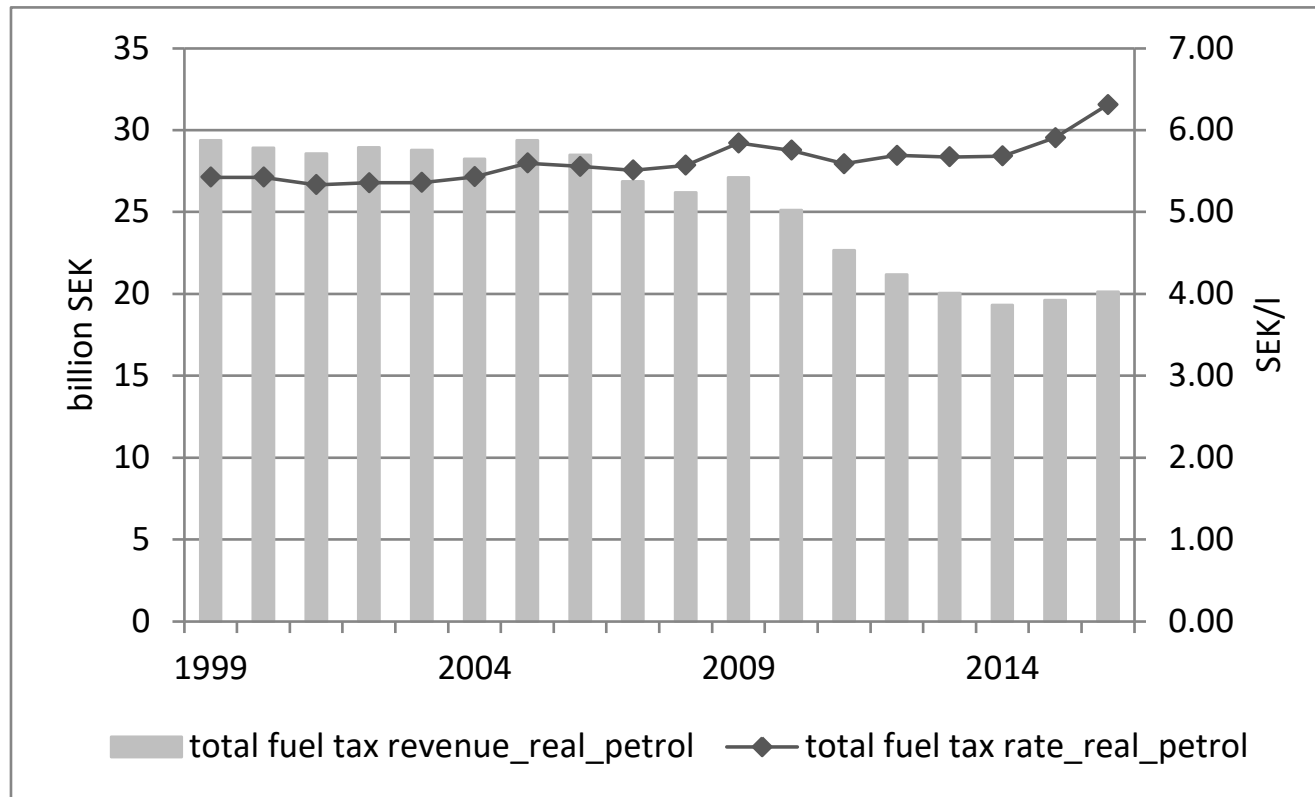


Note: Taxes excluding VAT. Real prices in 2016. Tax revenues have been calculated using fuel tax rates and energy use data.

Source: Swedish Ministry of Finance, SEA and own calculations

Declining fuel tax revenues from petrol

Figure 1. Total fuel tax revenues and tax rates (real) from petrol, 1999-2016



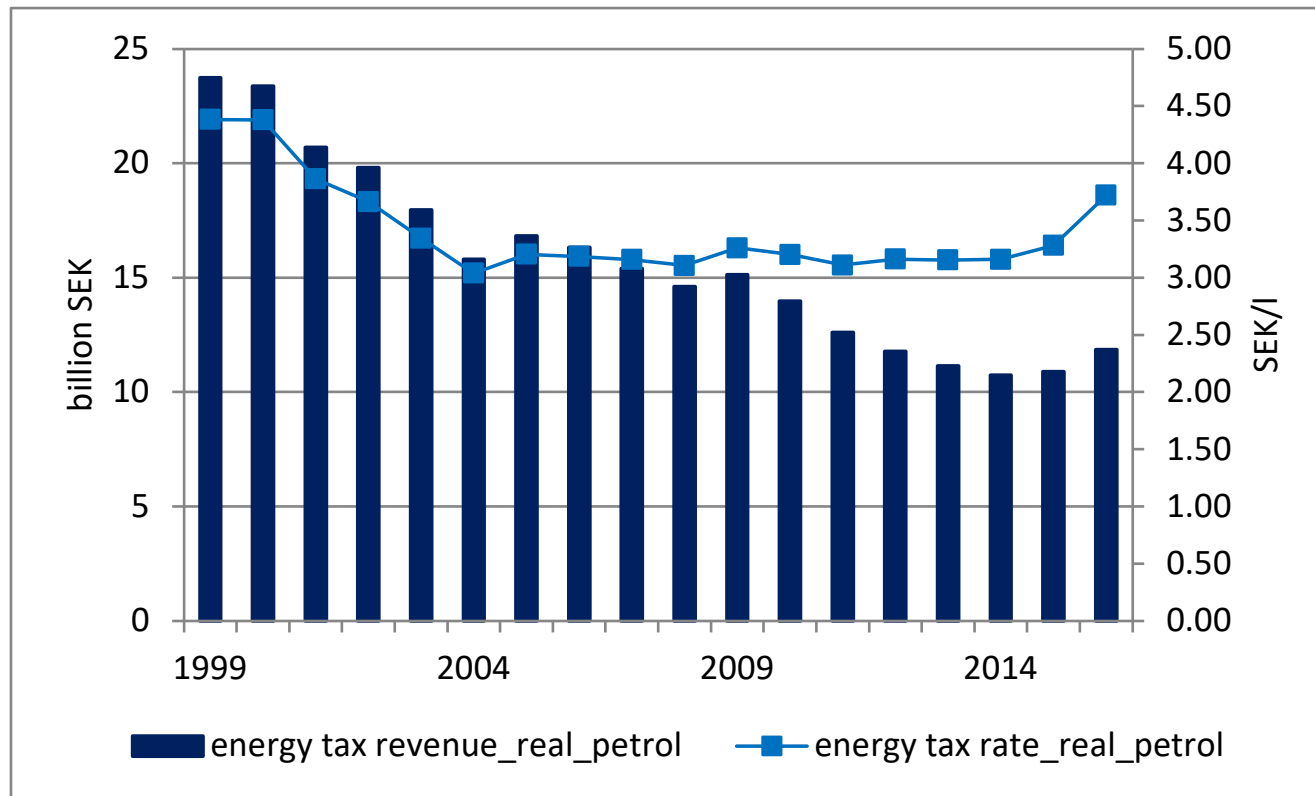
Note: Taxes excluding VAT. Real prices in 2016. Tax revenues have been calculated using fuel tax rates and energy use data.

Source: Swedish Ministry of Finance, SEA and own calculations



...both energy tax revenues

Figure 1. Energy tax revenues and tax rates (real) from petrol, 1999-2016

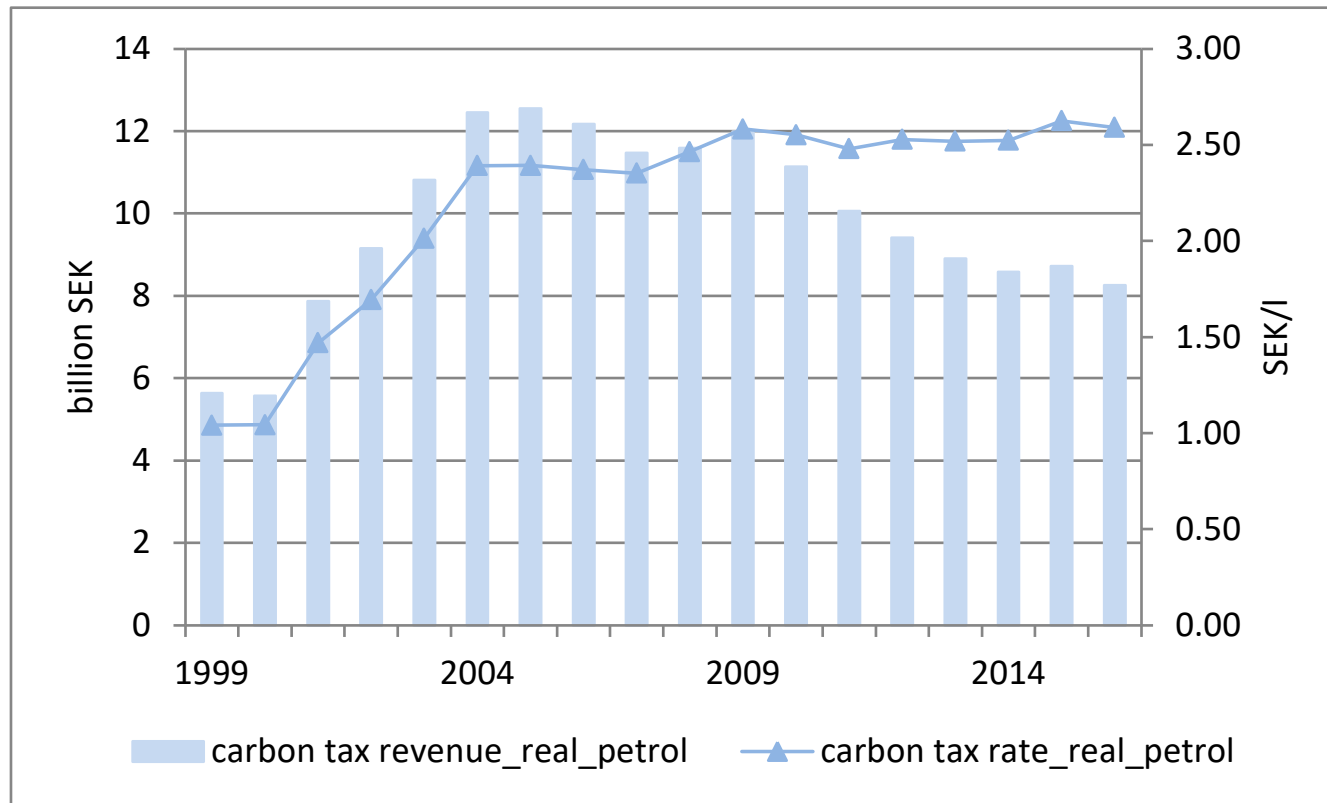


Note: Taxes excluding VAT. Real prices in 2016. Tax revenues have been calculated using fuel tax rates and energy use data.

Source: Swedish Ministry of Finance, SEA and own calculations

...and carbon tax revenues

Figure 1. Carbon tax revenues and tax rates (real) from petrol, 1999-2016

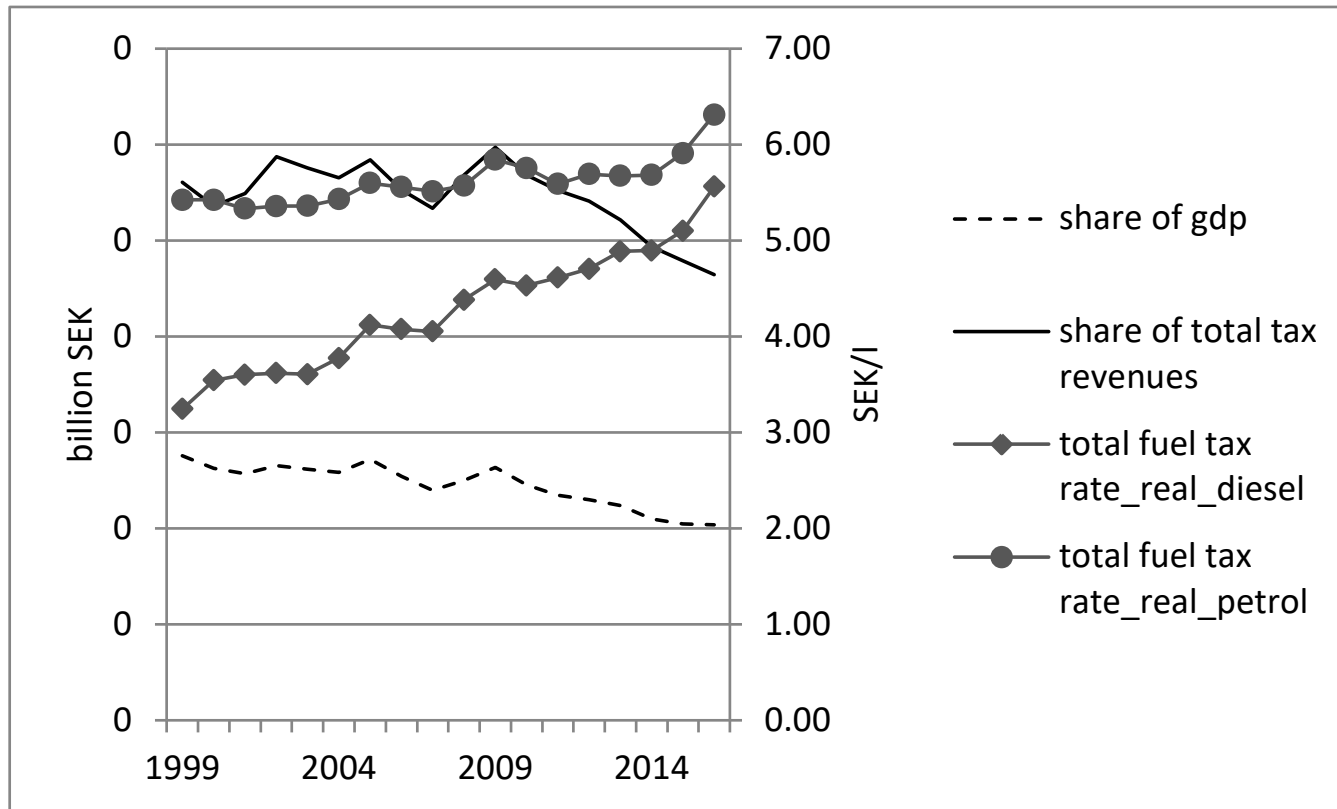


Note: Taxes excluding VAT. Real prices in 2016. Tax revenues have been calculated using fuel tax rates and energy use data.

Source: Swedish Ministry of Finance, SEA and own calculations

Declining share of total tax revenues and GDP

Figure 1. Total fuel tax rates and tax revenues as a share of national income and total tax revenues, 1993-2016



Note: Tax excluding VAT. Real prices in 2016.

Source: The Swedish Tax Agency, Statistics Sweden, ESV and own calculations.

Tax reforms and outlook

- National climate goal of reducing GHG emissions by 70 percent by 2030 compared to 2010
- Bonus malus-system for the purchase of new cars
- Emission reduction obligation for suppliers of petrol and diesel



In conclusion, stable source of tax revenue historically

- Motor fuel taxation a stable source of tax revenue over decades in Sweden
- No evidence of total motor fuel tax revenue levelling out, despite compositional changes in fuel demand
- Declining share of GDP and total tax revenues



But the policy landscape is changing

- Eroding carbon tax base among motor fuels
- Structural shift in motor fuel taxation?
- Towards biofuels and electrification
- Planning for a smooth transition



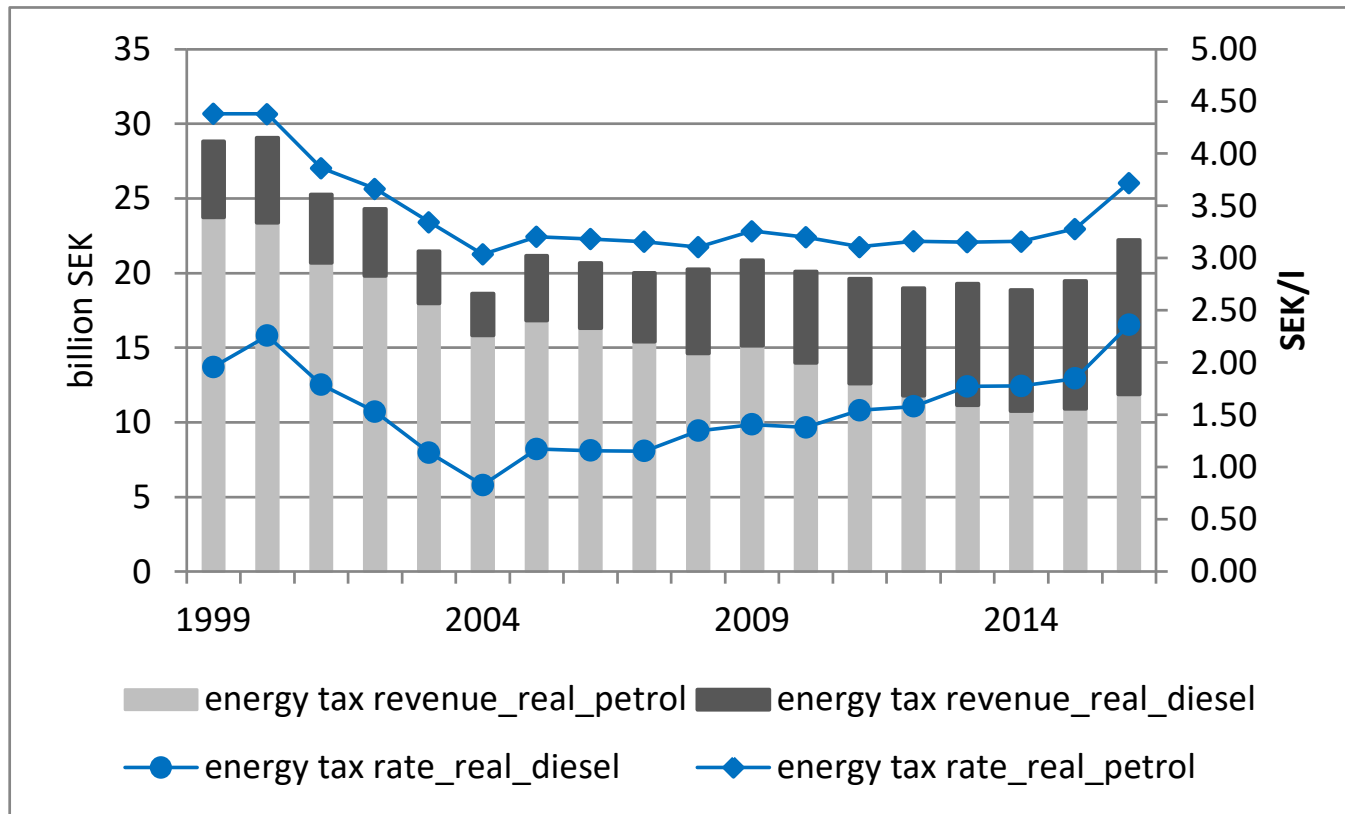
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Energy tax revenues

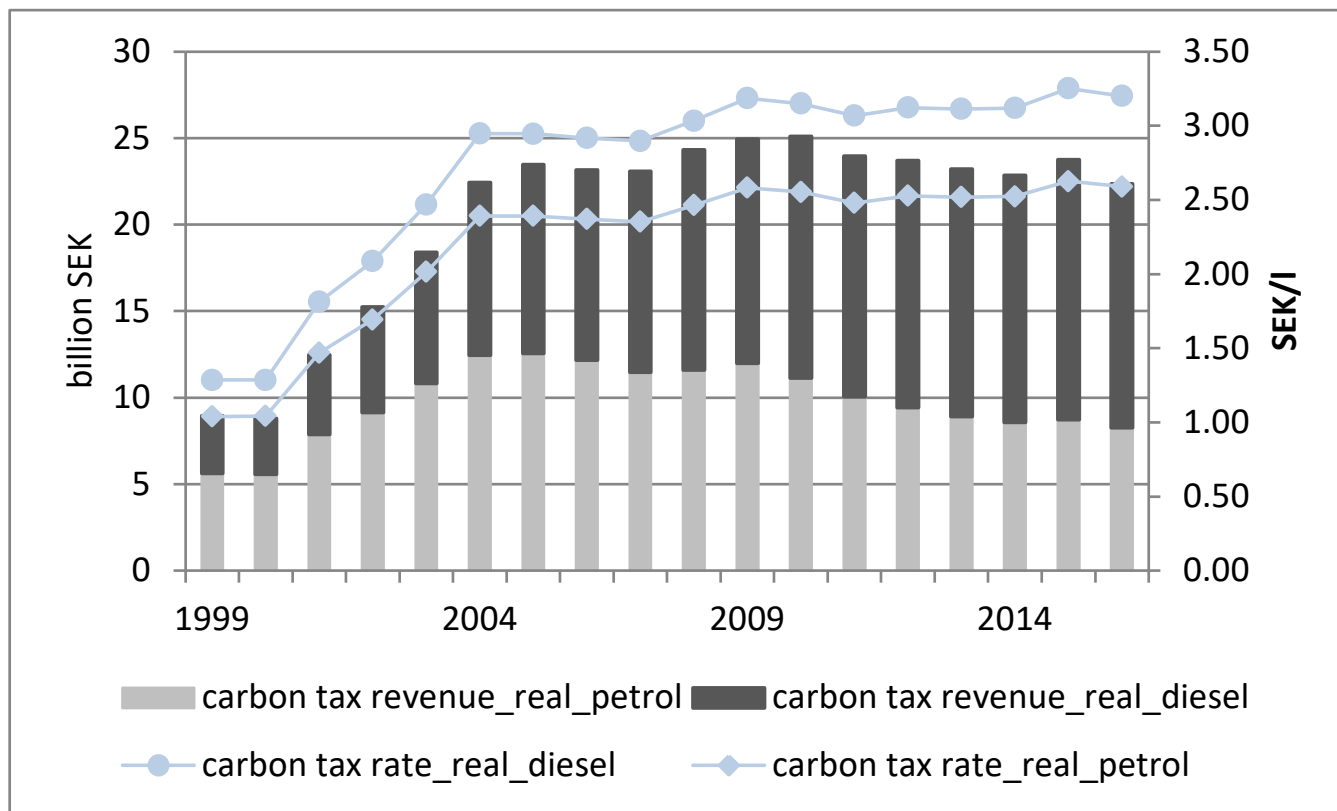
Figure 1. Total energy tax revenues and tax rates (real), 1999-2016



Note: Taxes excluding VAT. Real prices in 2016. Tax revenues have been calculated using fuel tax rates and energy use data.
 Source: Swedish Ministry of Finance, SEA and own calculations

Carbon tax revenues

Figure 1. Total carbon tax revenues and tax rates (real), 1999-2016

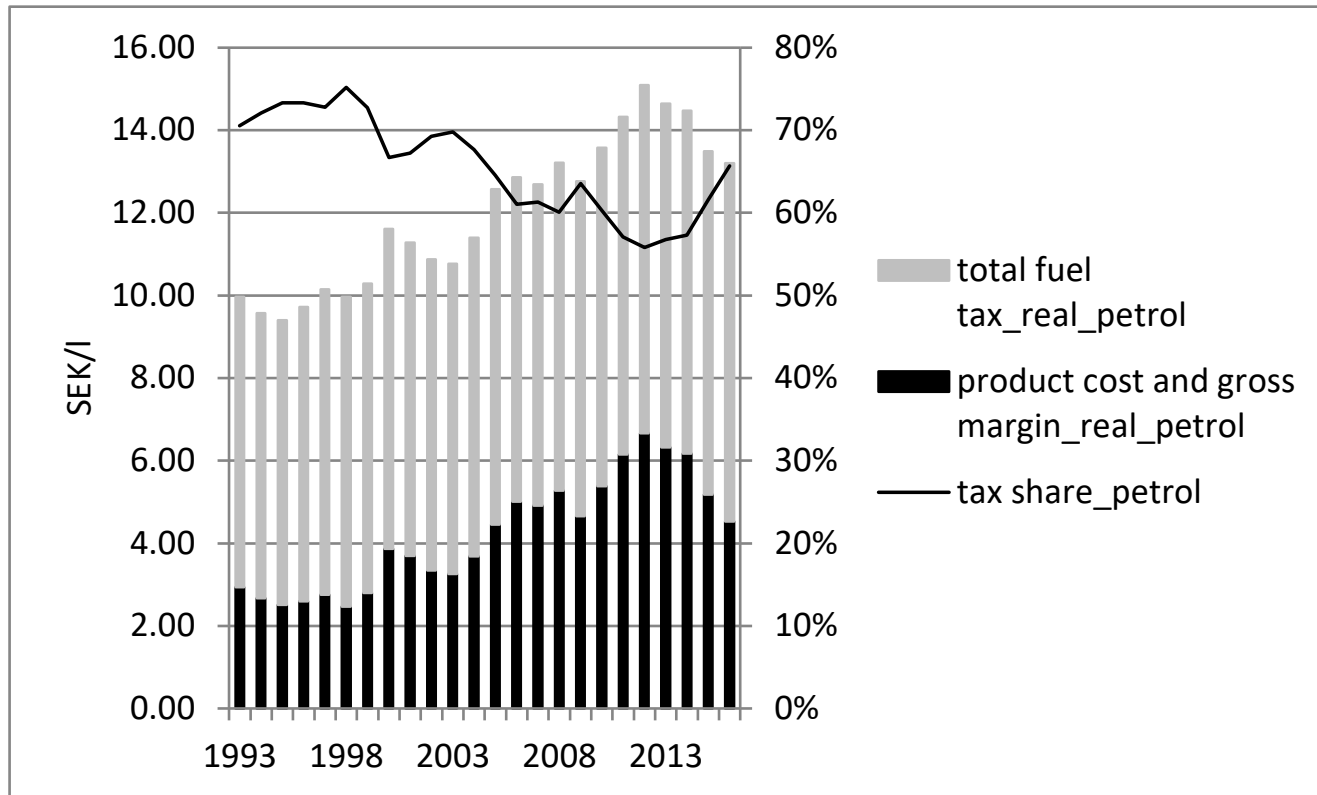


Note: Taxes excluding VAT. Real prices in 2016. Tax revenues have been calculated using fuel tax rates and energy use data.

Source: Swedish Ministry of Finance, SEA and own calculations

Final price and tax share for petrol

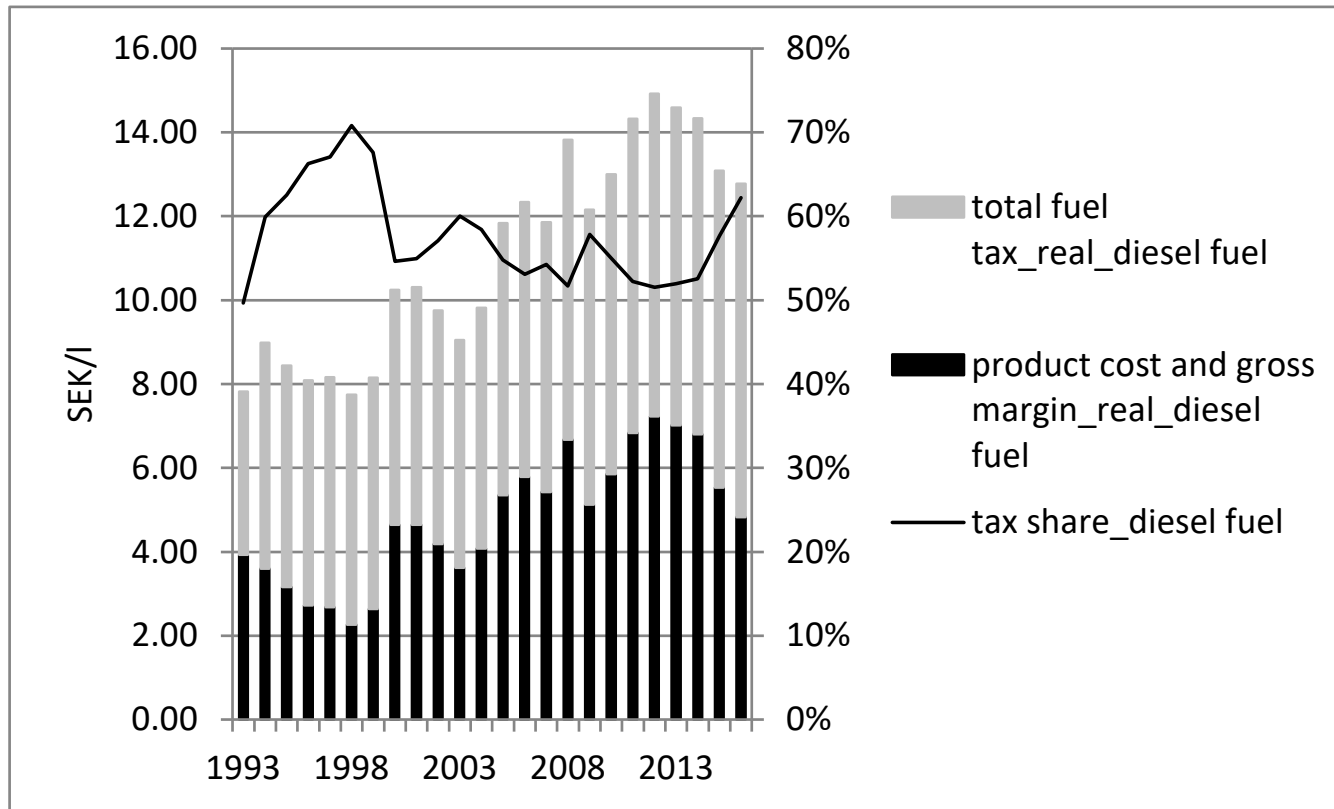
Figure 1. Final price at pump and tax share for petrol, 1993-2016



Note:
Source: SPBI

Final price and tax share for diesel

Figure 1. Final price at pump and tax share for diesel, 1993-2016



Note:
Source: SPBI