



DENMARK

SELECTED ISSUES

December 2014

This Selected Issues Paper on Denmark was prepared by a staff team of the International Monetary Fund. It is based on the information available at the time it was completed on November 17, 2014.

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International Monetary Fund
Washington, D.C.



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November 17, 2014

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HOUSEHOLD DEBT IN DENMARK¹

Danish household debt is the highest among the OECD countries, standing at about 300 percent of disposable income. This paper examines Danish household balance sheets and assesses factors that have contributed to the high level of household debt and their policy implications. Various factors seem to account for the size of household debt, including large pension assets, a highly developed mortgage market, the availability of flexible mortgage products such as deferred amortization loans, indirect subsidies through tax preferences for home ownership, and a regulated rental market that limits mobility. While direct risks of high household debt to financial stability have been contained so far, macroeconomic risks with possible indirect impact on financial stability still remain in the event of large adverse shocks. High debt may also be weighing on consumption, contributing to Denmark's still-significant output gap. Policy measures could be considered to facilitate further deleveraging in ways that minimize adverse effects on growth and to prevent rapid debt accumulation in the future, including reducing tax preferences for home ownership and using the fiscal savings to fund high-multiplier stimulative measures, removing distortions in the rental market, introducing tighter limits on interest only loans, and applying macroprudential tools.

A. Danish Household Balance Sheets

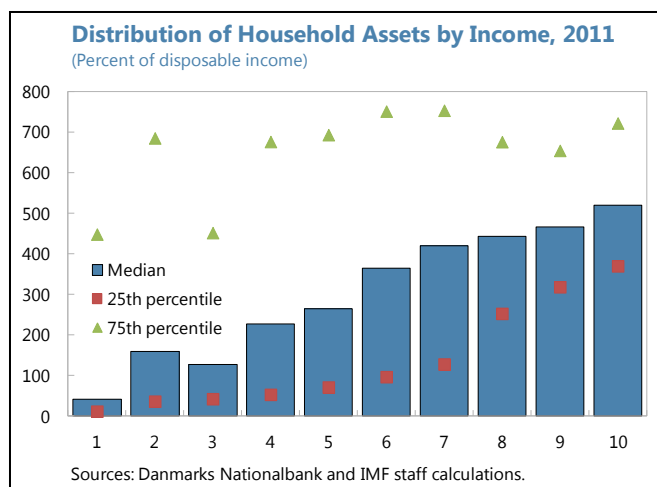
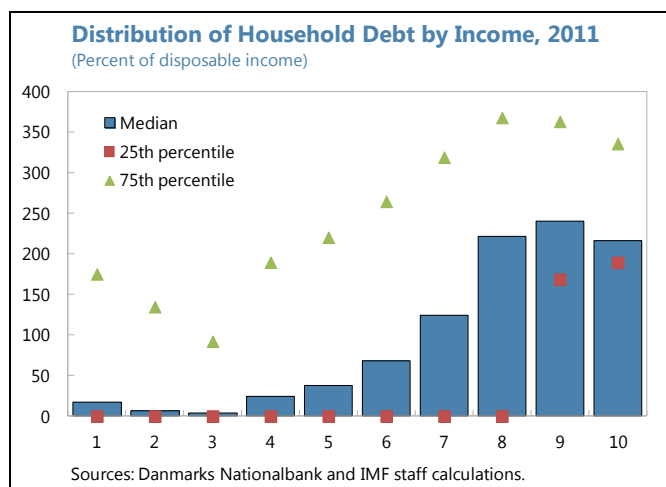
- 1. Danish household debt stands currently at about 300 percent of disposable income, the highest among OECD countries** (Figure 1.A). Household debt has been always relatively high in Denmark, well above 100 percent of disposable income even in the 1970s (Figure 1.B). The recent upward trend in household debt started in the late 1990s, reaching 300 percent of disposable income by 2008. This coincided with the period of rapid house price appreciation that peaked in 2007. The housing boom eventually ended with large house price corrections, but household debt remains elevated with only moderate deleveraging having taken place so far.
- 2. Household assets are also high in Denmark** (Figure 1.C). Danish household financial assets are among the highest in OECD countries, and together with non-financial assets (mostly housing wealth), Danish household assets stood at over 800 percent of disposable income in 2013.
- 3. Danish household assets have grown substantially over time** (Figure 1.D). While liabilities reached high levels, assets have risen even more rapidly for the past few decades. What is most noticeable about the asset side development of the Danish household balance sheets is the steady increase in pension assets. Pension assets (before taxes) were well below 100 percent of disposable income in the 1970s but continued to grow for the past decades, having reached above 300 percent recently. Assets in the form of securities and shares have also risen significantly in recent years while cash and deposits, the most liquid form of assets, have been relatively stable.

¹ Prepared by Kazuko Shirono (EUR).

4. While total household assets are high in Denmark, most of the assets are illiquid such as individual pension accounts and housing wealth (Figure 1.E). The size of illiquid assets is larger in Denmark than in most of its peers. On the other hand, the size of liquid assets is comparable with peers, only slightly higher than the peer average. Net worth is more than 500 percent of disposable income in Denmark, which is high but not significantly higher than other OECD countries.

5. Financial net worth gives a somewhat different picture about the financial position of Danish households (Figure 1.F). Once housing wealth is taken out, net worth drops significantly, even though it is still positive. Non-pension financial net worth, which takes out pension assets from financial net worth calculation, therefore taking account of only liquid assets, is negative for Denmark, which is also the case for the Netherlands and Norway. Negative non-pension financial net worth illustrates the importance of housing wealth and pension assets for household financial positions in these countries.

6. Danish household micro data show that high income families tend to have higher household debt while most households have substantial amount of assets. Median debt higher than 100 percent of disposable income is concentrated in families from income deciles 7-10, but 75th percentile numbers show that more indebted families tend to have much higher debt ratio than median in all income deciles. On the other hand, median household assets are substantially higher than median debt levels in all income deciles.²

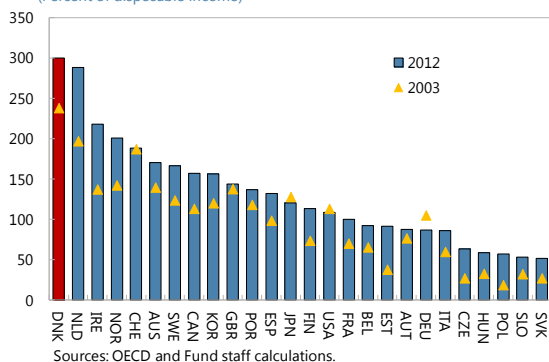


² However, households at the 25 percentile in debt are not necessarily in the 25 percentile in assets. If the highly-indebted households within each decile tend to be the low-asset households with each decile, then there could still be more distressed households than suggested by these figures.

Figure 1. Danish Household Balance Sheets

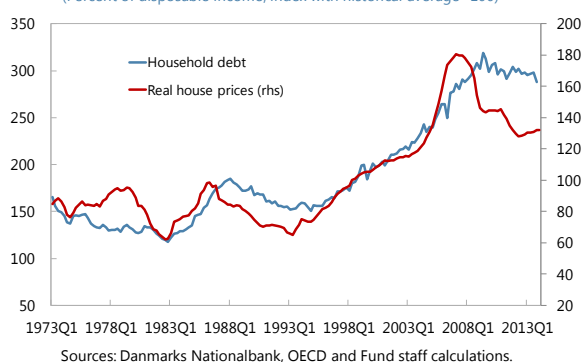
Danish household debt is the highest among OECD.

A. Household Debt in Selected OECD Countries, 2012
(Percent of disposable income)



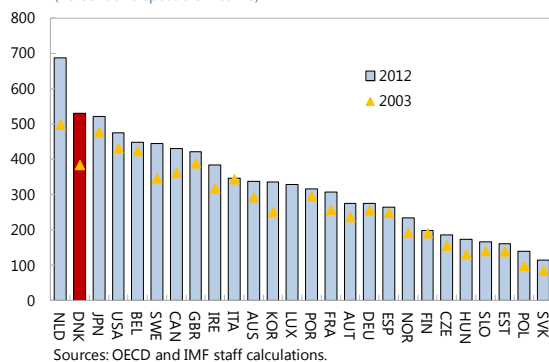
Household debt grew rapidly during the housing boom..

B. Danish Household Debt and Real House Prices
(Percent of disposable income, index with historical average=100)



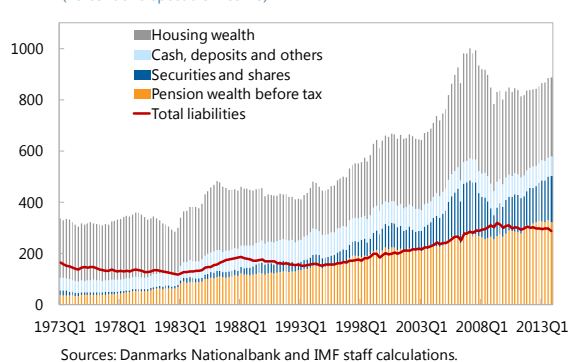
Danish household assets are also high...

C. Financial Assets in Selected OECD Countries, 2012
(Percent of disposable income)



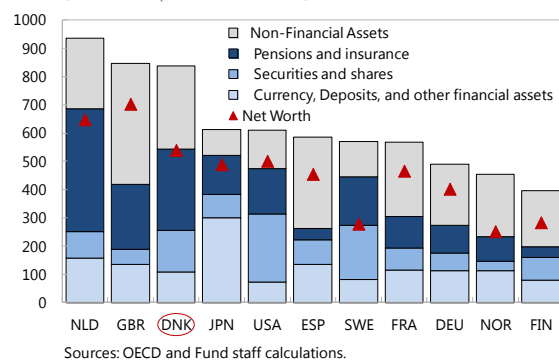
...in part due to the steadily growing pension assets.

D. Danish Household Balance Sheet
(Percent of disposable income)



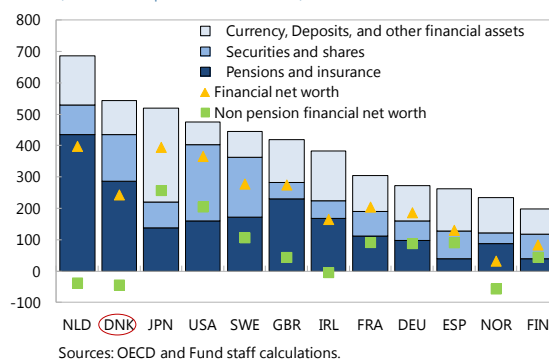
While Danish household net worth is positive and large, the asset side consists of mostly illiquid assets...

E. Composition of Household Assets
(Percent of disposable income, 2012)



...leaving Danish households more prone to liquidity constraints in the face of shocks.

F. Financial Assets and Financial Net Worth
(Percent of disposable income, 2012)



7. In sum, Danish household balance sheets are characterized as large liabilities and assets, and assets consist mostly of illiquid assets in the form of housing and pensions. In light of these findings, the next section analyzes factors that account for high levels of Danish household debt.

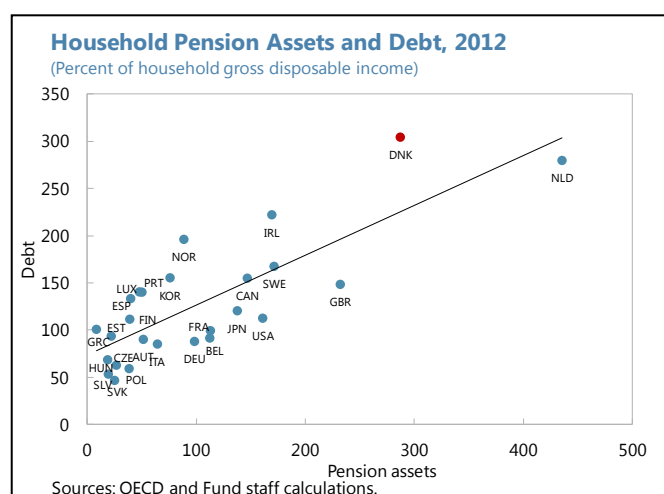
B. What Determines the Level of Household Debt?

8. **Social and institutional setups are likely to matter in accounting for household debt.** In simple economic models, household consumption is determined based on expected lifetime income, interest rates, and preferences for current and future consumption. The current level of spending, together with the current level of household income, determines the level of saving or borrowing. The life-cycle and permanent income hypotheses suggest that households will tend to take on debt when they are young, gradually shift to positive net worth as their incomes rise over time, and eventually run down their net worth in retirement. While these are well accepted theories, in practice, various institutional factors also affect households' decision to take on debt. This subsection focuses on institutional aspects – including the pension system, mortgage products, tax preferences for home ownership, and the rental market – to shed light on factors behind Denmark's high level of household debt.

Pension assets

9. **Social institutions affect households' consumption-smoothing decisions.** Where the welfare system is well developed, households take account of transfers and welfare and pension benefits provided by the government as part of their lifetime income. Cross-country differences in household debt are thus likely to reflect, at least partly, differences in welfare system. In particular:

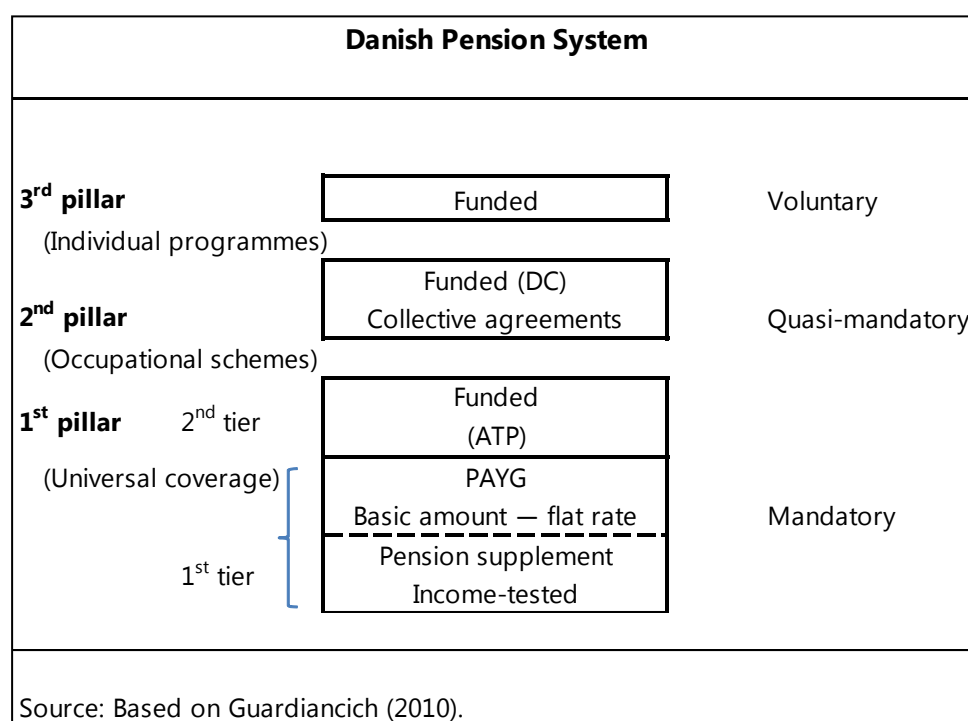
- Pension contributions tend to reduce the amount of current disposable income, thereby increasing the need for households to borrow more when they are young. Large pension benefits also reduce the need to save for retirement.
- As noted earlier, the size of pension assets as a share of disposable income is very large in Denmark (see Box 1 for a description of the Danish pension system). Occupational pension schemes, which started in the late 1980s and early 1990s, are likely to have contributed to the persistent increase in pension assets for the past decades. As the system is not fully phased in, the accumulation of pension assets relative to disposable income is likely to continue increasing over the next two decades or so.



Box 1. Danish Pension System

The Danish pension system consists of multiple pillars:

- The first pillar is state retirements and **statutory schemes**, which are mandatory. The first pillar has two components: (i) Basic pension; and (ii) labor market supplementary pension (ATP). ATP is a fully funded defined-contribution scheme.
- The second pillar is quasi-mandatory **occupational pension schemes** which are agreement-based and cover about 90 percent of labor force. These schemes are also fully funded defined-contribution schemes. Occupational pension schemes were established as part of collective bargaining at the end of the 1980s, and they are typically sector-specific. Contributions to occupational pensions range between 9 and 17 percent of gross wages
- The third pillar is a voluntary **supplementary pension schemes**, typically managed by banks and insurance companies.



The Danish pension system resembles the Dutch pension system which also consists of three pillars: The first pillar is basic state old age pension under a statutory insurance scheme. The second pillar is quasi-mandatory occupational schemes which cover about 90 percent of employees (OECD, 2013). The third pillar is voluntary private pension schemes. The key difference between Danish and Dutch pension systems is that while Danish pension schemes are mostly defined-contribution schemes with individual accounts, the Dutch system is mostly based on defined-benefit schemes.

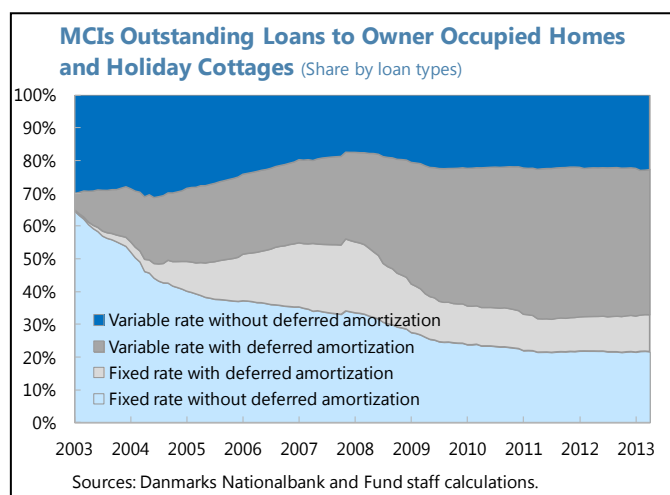
The increasing size in pension assets is likely to have supported, at least partly, the recent rise of Danish household debt. On the other hand, Danish household debt was relatively high even back in the 1970s when the size of pension assets was smaller. This suggests that some other factors were also at play.

Housing market

10. The way the housing market is organized is likely to affect households' behavior as well. A large portion of household debt consists of mortgages. Thus institutional factors that affect the effective cost of credit and mortgage affordability are likely to influence households' behavior. These factors include mortgage product innovation and tax preferences for mortgage debt and home ownership.

11. Mortgage market. The Danish mortgage market is highly developed. The Danish market for covered bonds backed by mortgage loans is one of the largest in the world. The stock of covered bonds is equivalent to 143 percent of GDP, more than four times larger than in other countries (IMF, 2014). Mortgage credit is readily available in Denmark, and the average price of mortgage loans is among the cheapest in Europe when adjusted for fees and the cost of pre-payment options (Erlandsen et al., 2006). The well-developed mortgage market has supported Danish households to finance their home purchases and build housing wealth throughout the past few decades.

12. The Mortgage product innovation. Mortgage lending has seen significant product innovation since the late 1990s. The Danish mortgage market was dominated by fixed rate mortgages until variable rate loans were introduced in 1996. The share of variable rate loans made by mortgage credit institutes (MCIs) to households grew from zero to about 35 percent by the end of 2003 and stands at close to 70 percent as of March 2014. "Interest only" (IO) loans—these are called deferred amortization loans in Denmark as they normally come with a deferred amortization period of up to 10 years—were introduced in 2003, joining the group of



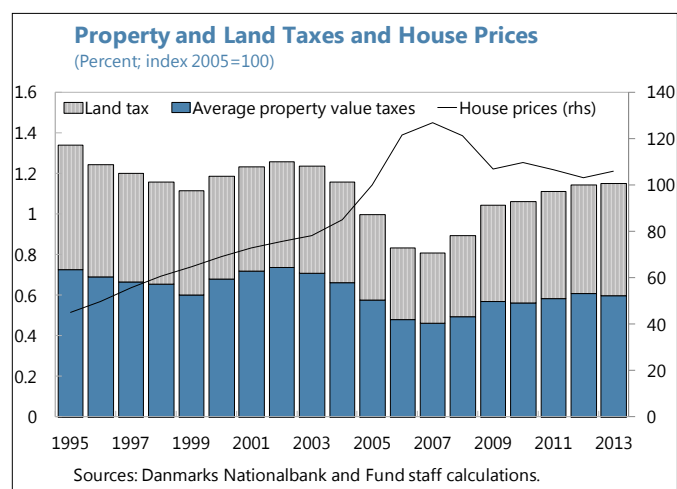
Availability of interest-only mortgage loans		
	1995	2005
Australia	NA	A
Denmark	NA	A
Finland	NA	A*
France	A	A
Germany	A	A
Greece	NA	A*
Ireland	A	A
Korea	NA	A
Netherlands	A	A
Portugal	NA	A
Spain	?	A
Switzerland	A	A
UK	A	A

A= available NA=not available
*With associated repayment vehicle
Source: Scanlon et al. (2008)

European countries which have IO loans.³ The use of deferred amortization loans grew rapidly since then, and these loans account for a little over half of outstanding loans by MCIs in recent years. These new mortgage products, particularly the use of deferred amortization loans are likely to have increased the affordability of mortgages among households with limited capital and therefore have contributed to the rapid increase in household debt in Denmark since 2003.

13. Tax preferences for owner-occupied housing and mortgage debt contribute to high household debt.

- Denmark, like many other advanced economies, allows mortgage interest deductibility from taxable income. The degree of mortgage interest deductibility has been lowered in stages over time. The 1994–98 tax reform reduced deductible interest payments to about 46 percent, and deductibility was lowered further to 33 percent in 2002 (Erlandsen et al., 2006). Starting from 2012, mortgage interest deductibility for interest payments exceeding DKK 50,000 is planned to be reduced to 25 percent by 2019.⁴ In 2014, interest deductibility still remains at 33 percent (Table 1). Despite the gradual reduction in mortgage interest deductibility, the degree of tax relief on debt financing cost, measured by the difference between the market interest rate and the after-tax debt financing cost of housing, is high in Denmark among OECD countries, the third most generous after the Netherlands and Czech Republic (Andrews et al., 2011).⁵
- Tax rates for property tax in Denmark are higher than those in most peer countries listed in Table 1. However, a tax freeze was introduced in 2002 and there are also special reductions, so the actual tax burden is lower than the rates suggest. The taxable value for property value tax is effectively frozen at the assessed value in 2001, implying that a nominal ceiling is imposed on the property value tax so that a rise in the value of property will not increase tax payments for the home owner.⁶ In addition, a limit of 5 percent for the annual increase in payments of land taxes was introduced in 2002, further reinforcing the pro-cyclical



³ The text table shows the availability of IO loans as of 2005, which could differ from the current practice. For example, IO loans are no longer offered in Ireland.

⁴ This applies to both new and existing mortgages.

⁵ This assessment refers to the condition in 2009.

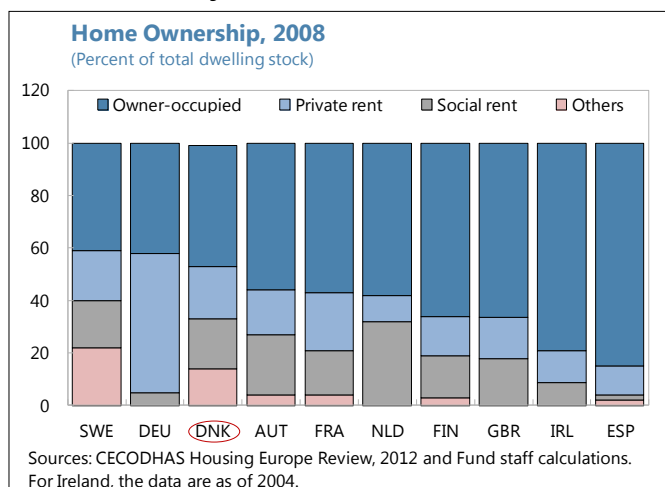
⁶ With the tax freeze and other special reductions for houses and flats bought before July 1998 and for pensioners, the average effective rate paid in 2006 was 0.55 percent of the assessment value even though the statutory rate of real estate tax is 1 percent (and 3 percent above a certain threshold) (Erlandsen et al., 2006).

pattern of house prices and implied tax rates (Callesen, 2013). These limits on property tax payments not only serve as an implicit subsidy for housing but also could amplify economic cycles through the pro-cyclicality.

Rental market

14. The structure of the rental market also affects the demand for housing and mortgage debt. A well-functioning rental market would allow people to make non-distorted choices about housing and asset structure. Distortions in the rental market may make rental properties inaccessible to those household who would prefer to rent (e.g., new families) and thus force households to pursue homeownership earlier than they would otherwise or when it is otherwise not the best option, creating excess demand for housing and mortgage debt, possibly increasing price volatility for owner occupied houses.

15. The rental market exists in Denmark, but it has many distortions.⁷ The share of rental dwellings is relatively high in Denmark compared with other OECD countries, but Danish rental housing (both private and social) is subject to rent regulation and also receives more direct/indirect public subsidies than owner-occupied housing. Housing allowances are the major direct support, covering both social housing and private rental housing. About 20 percent of the population received cash allowances for rental costs.⁸ These allowances on average cover 40 percent of the actual rents paid in Denmark.



16. Rent regulation for social housing based on cost-based principles implies that rents may deviate from the market-clearing level in both directions. On average, the rent level in social housing is estimated to be below the market-clearing level, being reflected in waiting lists for attractive apartments (Erlandsen et al., 2006). However, given mortgage products innovations and tax subsidies for owner-occupied housing, the after-tax monthly financing costs of owner-occupied housing could be lower than rents in recently constructed social housing in some areas.

⁷ More recent data for Denmark (2013) also shows a similar composition of home ownership. "Others" for Denmark in the text chart is mostly cooperative housing.

⁸ Danish Ministry of Economic Affairs and the Interior. Andrews et al., 2011 also report that the share of population receiving cash allowances for rental costs is higher in Denmark than most other OECD countries.

17. In the private rental market, tenant rights are highly protected. Open-ended leases are the standard contract, and the landlord cannot terminate the contracts except in certain cases. Tenants are also given the right to sub-let. Buildings built before 1991 are subject to rent control, and more than 80 percent of the private rental housing market stock in Denmark is under rent regulation (Erlandsen et al., 2006). Cuerpo et al. (2014) reports that the degree of rent control in Denmark is the third highest among their sample of 20 European countries. These distortions are likely to have limited mobility and may constrain the private rental market, which is much larger in neighboring Germany.

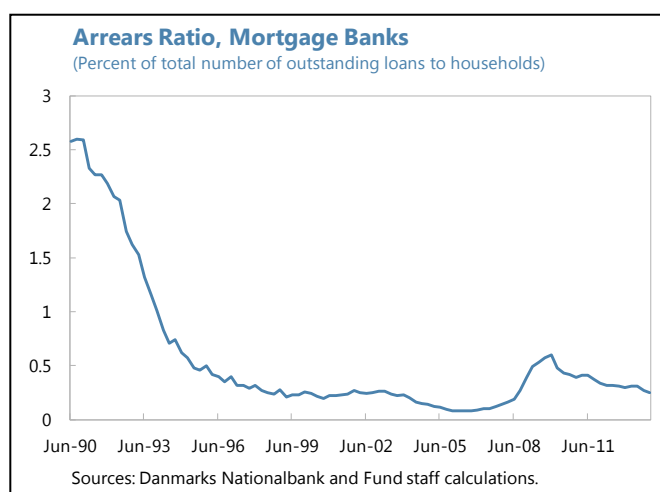
18. In sum, the interaction of various institutional factors seems to explain high household debt in Denmark. While Denmark's mortgage market is well functioning and highly developed, there are large direct and indirect subsidies for all types of housing, and the highly regulated rental market is likely skewing housing needs and use in Denmark. The coexistence of a well-developed mortgage market and regulated rental market, together with large tax preferences for owner-occupied housing and mortgage debt seems to have supported the underlying tendency of high household debt in Denmark. The 2000-07 housing boom, combined with mortgage product innovations and the rise in financial assets (especially pension assets), are likely to have contributed to the further surge in household debt since the late 1990s.

C. Macroeconomic Impact of High Household Debt

19. High household debt could pose direct risks to financial stability if the number of mortgage loan defaults rises sharply in the face of adverse shocks. In practice,

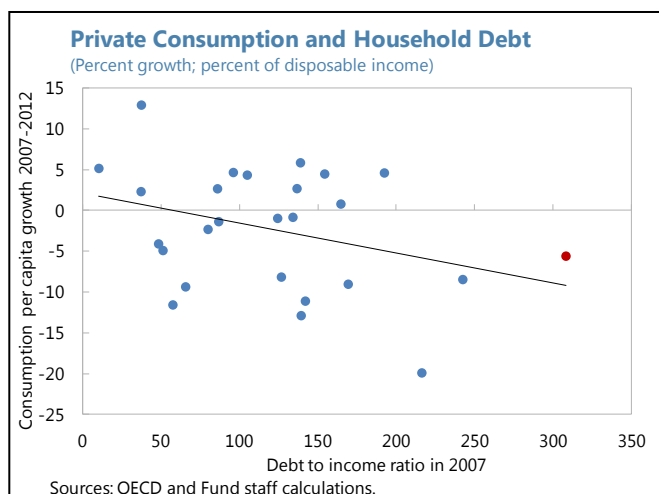
however, despite the high level of household debt, the household arrears ratio remains relatively low in Denmark, after rising slightly during the global financial crisis. The low level of arrears reflects the strong legal and regulatory framework in Denmark: The LTV ceiling of 80 percent on new mortgage loans limits lender losses in the event of a default. In addition, mortgage loans are full recourse backed by quick repossession and forced sale procedures. A mortgage loan is

considered in default after 3 ½ months of non-payment, and forced sale procedures are initiated unless alternative workout procedures are agreed with the borrower. It typically takes less than nine months from the payment becoming overdue to the property being sold. This also contributes to limiting mortgage banks' potential losses. If the sales of the property do not sufficiently cover the mortgage bank's claim, the uncovered claim remains as an unsecured claim against the borrower.



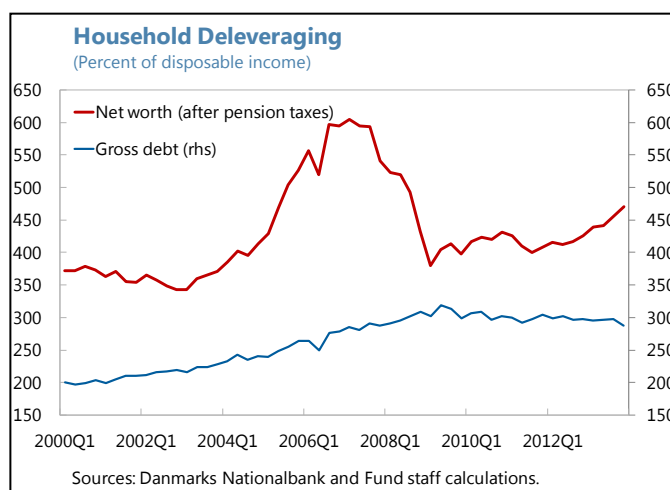
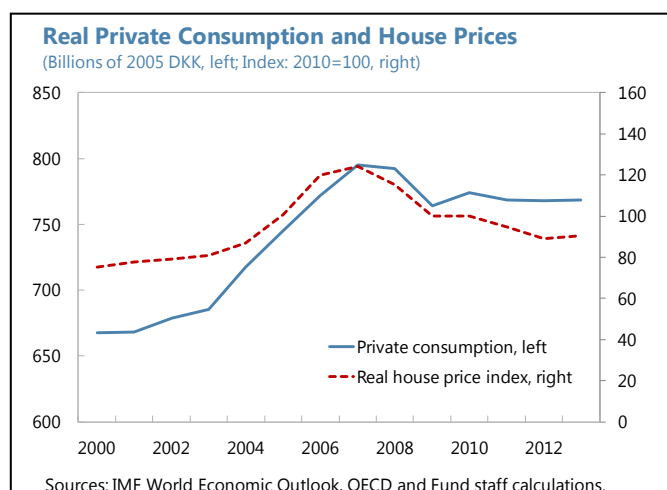
20. Previous studies have found that direct risks from high household debt to financial stability are limited in Denmark. A series of papers by the Danmarks Nationalbank using Danish household micro data have demonstrated that gross debt is highly concentrated among high-income families as well as households with larger financial assets. The Nationalbank's stress tests have also shown that most households are resilient to interest rate shocks and the number of families in arrears remains relatively low even in stress scenarios (Danmarks Nationalbank, 2012; Danmarks Nationalbank, 2013). Overall, these studies have concluded that elevated household debt does not directly threaten financial stability.

21. However, high levels of household debt may pose risks to macroeconomic stability by dampening consumption. Case et al. (2005) and Case et al. (2013), examining the link between increases in housing and financial wealth and household spending, find a large effect of housing wealth on household consumption using a panel of country level and U.S. state-level data. Dynan (2012) uses U.S. household level data to examine the effect of leverage and debt overhang on household consumption. She finds that highly leveraged homeowners had larger declines in spending between 2007 and 2009 than less leveraged ones even when the former had smaller changes in net worth. Her results support the view that excessive leverage has contributed to the weakness in consumption. More aggregate cross-country studies have also shown that high household debt is linked to lower consumption. IMF (2012) finds that housing busts preceded by larger run-ups in gross household debt are associated with significantly larger contractions in economic activity, with larger declines in household consumption and real GDP and more increases in the unemployment rate, and the reduction in economic activity persists for at least five years.



22. Recent empirical results about Denmark are also in line with the earlier findings. A study by Danmarks Nationalbank, based on Danish household micro data, has also shown that households with high loan to value (LTV) ratios cut consumption more than households with low LTV ratio during the global financial crisis (Andersen et al. (2014)). The larger drop in spending among the high-LTV households reflects the fact that these families consumed a larger fraction of their income than their less-leveraged peers prior to the crisis. These results suggest that consumption was lowered more than would have been the case if Danish households did not have so much high debt levels.

23. These findings suggest a need for measures to facilitate further deleveraging and prevent excessive debt accumulation in the future. Denmark's real private consumption has been flat in recent years and the deleveraging process has been slow. As a result, the recovery after the global financial crisis has been anemic. While high household debt may have had limited direct impact on financial stability, risk associated with household debt still remains in the Danish economy and could appear somewhere else (e.g., problems with commercial loans due to reduced consumption, especially in retail, commercial real estate and construction sectors) if further large shocks hit the economy. These macroeconomic impacts could feed back into financial stability (most likely in the commercial banks rather than the mortgage banks) if loan problems in the affected sectors are large enough.⁹ High levels of household debt thus increases the vulnerability of the economy, and therefore policy measures are needed to ease debt levels gradually and facilitate the rebuilding of buffers so that these risks are mitigated. The next section discusses possible policy options.



D. Policy Options

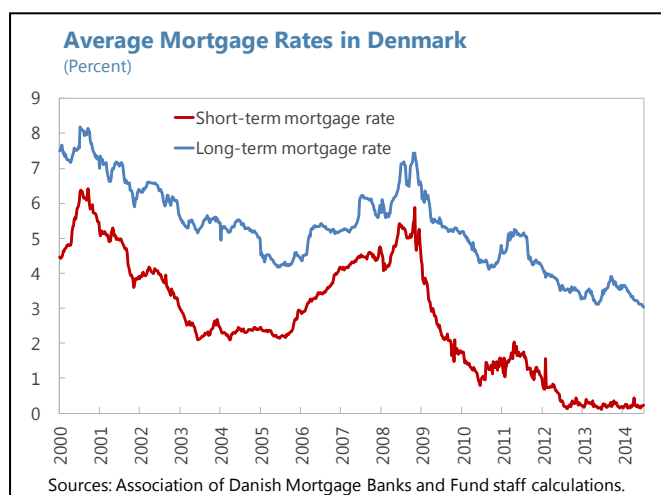
24. Policy changes could be considered in several areas. The discussion in Section B suggests that the functioning of the housing market could be improved by removing various direct and indirect subsidies to owner-occupied housing and by making the private rental market more flexible, while ensuring that risks are better managed in the mortgage market. Possible policy options include the following:

- **Reducing tax preferences for owner-occupied housing and mortgage debt:** As discussed earlier, tax relief on the debt financing cost of owner-occupied housing is relatively large in Denmark. Mortgage interest deductibility is expected to be reduced gradually by 2019. Given

⁹ See Andritzky (forthcoming) for discussion on negative feedback loops of household debt.

the current low interest rate environment which limits the effective benefit of interest deductibility and improving housing market conditions, now seems to be the right time to implement the reduction. Some countries are implementing these measures recently. For example, the Netherlands, where mortgage interest was fully deductible, introduced changes in January 2013 (Box 2): Only interest on fully amortizing mortgages is now tax deductible for new loans.¹⁰ Mortgage interest deductibility will be also reduced to 38 percent in steps of ½ percent per year. Moreover, the valuation of properties for tax purposes should also made more in line with the market value so as to remove the pro-cyclicality of effective tax rates and house prices due to the tax freeze. Fiscal savings from such tax changes could be used to fund stimulative measures with a high multiplier, thereby providing a “balanced-budget stimulus.”

- Reforming the rental market to enhance flexibility:** Distortions in the rental market should be minimized to allow the rental market to function as a complementary alternative to home ownership. Cueropo et al. (2014) argues that rent controls have a significant destabilizing impact on the aggregate housing market. They also advise against using rent controls for redistribution purposes, noting that more targeted policies would be welfare-enhancing without affecting rental market efficiency. Spain and Portugal have implemented reforms recently to increase the rental market efficiency (The size of rental market is small in these countries). In Spain, rent increases for new leases are now set freely by the contractual parties without the need to explicitly index the increase to the consumer price index. The tenant-landlord relationship is also now more balanced—previously, tenants were heavily protected and landlords’ rights were limited—through measures such as reducing the minimum contract duration from five to three years.
- Discouraging the use of deferred amortization loans:** Adjustable and variable rate loans with and without interest only periods are the dominant form of mortgages in Denmark. These loans played an important counter-cyclical role during and after the financial crisis as borrowers were able to reduce payment obligations by shifting as rates on existing adjustable-rate loans fell and as households shifted from high fixed rates to the lower rates on adjustable rate loans. However, these loans have potential adverse effects on loan default risk and impairments, as they increase the sensitivity of the economy to interest rate hikes. Deferred amortization loans also delay the process of



¹⁰ However, mortgages outstanding as of January 1, 2013 are unaffected.

deleveraging. Measures aimed at reducing the use of deferred amortization loans could be considered. For example, eligibility for such loans could be limited to loans with LTVs well below 80 percent or borrowers could be required to amortize the portion of the loan above a lower LTV ceiling, or risk weights and/or generic provisioning for IO loans could be escalated.¹¹ The recent proposals for Supervisory Diamond for mortgage credit institutions which include limiting short-term bonds and loans with interest only periods go in the right direction. Gradually removing the tax deductibility of interest payments on deferred amortization loans could also be considered to encourage borrowers to use such loans more sparingly. As mentioned earlier, the Netherlands has taken this measure recently by ending tax deductibility for non-amortizing mortgages (Box 2).

- **Using macrorudential tools:** To prevent rapid accumulation of household debt in the future and mitigate vulnerabilities, new policy instruments could be considered. The use of limits on LTV ratios and debt service-to-income and/or debt-to-income ratios could be explored.¹² In the Netherlands, the LTV limit of 100 percent was introduced in January 2013. It will be reduced further by 1 percent per year until it reaches 100 percent. A lower LTV limit of 50 percent applies to IO loans. In addition, higher risk weights, increased sectoral capital requirements, or higher provisioning can be also applied to sectors with higher LTVs or to loans exceeding certain thresholds for LTVs.
- **Easing liquidity constraints:** The Netherlands has recently taken a measure to temporarily raise the exemption threshold on the gift tax to €100,000 if the recipients use the gift to pay down mortgage debt ahead of schedule (see Box 2). This is unlikely to have a large effect, but this may be a relatively costless way to facilitate deleveraging.

¹¹ See the 2014 Financial System Stability Assessment report for a set of recommendations on the mortgage market and covered bonds including ones on deferred amortization loans,

¹² Although Denmark has an LTV limit on mortgage loans that are funded by covered bonds, borrowers can exceed the limit by taking out other loans.

Box 2. Measures to Reduce Household Debt in the Netherlands

The Netherlands' household debt stands at about 300 percent of disposable income in 2013, only slightly higher than in Denmark. House prices fell by 27 percent in real terms in Netherlands, resulting in a loss of housing wealth of about 60 percent of GDP. The loss is concentrated mainly among younger cohorts where an estimated 60 percent have mortgages that are underwater.

To address household debt overhang, the Dutch authorities introduced a series of policy measures in January 2013, targeting the owner occupied housing sector. These measures include:

- Tax deductibility was also partially removed. Only interest on fully amortizing mortgages is now tax deductible. Unlike in Denmark where deferred amortization loans typically come with a limited interest-only period, IO loans without any amortization are common in the Netherlands.
- LTV was capped to 106 percent, which will be reduced further by 1 percentage point per year to reach 100 percent in 2018. Lower LTV limit of 50 percent applies to IO loans.
- Prepayment on mortgage with 10 years or less of remaining maturity is made possible without penalty.
- A temporary tax exemption (until end 2014) for monetary gifts of up to €100,000 used to reduce mortgages debt was introduced. More than 50,000 households have used the scheme so far. This measure is an attempt to encourage more transfers between the elderly and younger households, thereby easing liquidity constraints facing the latter and helping to boost their consumption and support aggregate demand.

Netherlands shares many similar features to Denmark: A highly developed mortgage market, large pension assets, tax preferences for owner-occupied housing, and distortions in the rental market. Despite these similarities, however, issues facing the Netherlands are somewhat different from those in Denmark, in part due to the differences in the institutional setups.¹

For example, the Dutch pension schemes are mostly defined-benefit schemes. Occupational pension accrual rates are equal for all participants and younger employees contribute in excess of the present value of their pension benefits. This implies that savings are transferred from the relatively poorer young to the wealthier old. In this context, Mirkaic (forthcoming) shows that reducing pension contributions to an actuarially fair level and keeping the accrual rate unchanged could free up income to increase consumption and lower debt of younger households by 2-4 percent annually. On the other hand, this issue does not arise in the case of Denmark because the Danish pension schemes are mostly define-contribution schemes with individual accounts.

1/ See Hassine (forthcoming) for institutional details on the Dutch housing market and its mortgage financing system.

Table 1. Taxes on Housing							
	Finland	Denmark	Norway	Sweden	Ireland	Spain	Netherlands
Mortgage interest tax deductibility	75% of interest paid are deductible from taxable capital income.	32.7 % of mortgage interest can be deducted in other taxable income. The value of deduction is reduced by one percentage point per year between 2012-2019 to 25% (33% during 2002-2012)	Fully deductible	30% of interest expenditure is deductible from other taxable income.		Up to 30% of mortgage interest paid for first-time buyers, and 15% for others up to a certain number of years and up to an absolute ceiling. Only mortgages taken out before end 2012 qualify, and all relief terminates at end 2017. Mortgage interest payments are not PIT deductible for properties purchased after January 1st 2013	Fully deductible with no cap (limited to fully amortizing loans, extended since Jan 2013; earlier non-amortizing loans continue to be eligible to the full mortgage interest deductibility.)
Capital gains tax	30% applicable to income up to EUR40,000 and 32% on income exceeding that amount	Exempt if the owner lived	Exempt if lived for one year	0.3	33% unless owner occupied, with special exemptions for properties purchased in 2012-14	19% < EUR6,000 21% > EUR6,000	Exempted if dwelling is main fiscal residence
Inheritance tax (inheritance to family members)		15 % of the estate exceeding DKK 264,100 (2012). No tax on spouse.	Abolished in 2014	Abolished in 2005	33% > EUR225,000 (to children). No tax for transfer to spouse or family members living in	0.8%-36.5% (2013)	€100,000 exempted if donated to reduce mortgage debt (temporary)
Property tax							
Municipal tax	<i>Real estate tax</i>	<i>Municipal real estate tax (land tax)</i>	<i>Municipal tax</i>	<i>Municipal property fee replaced real property tax on private residence in 2008</i>	<i>Local property tax</i>		
	0.6-1.35% (0.32-0.75% for primary residence)	1.6-3.4%	0.2-0.7 %	SEK7,074 fee or 0.75% of the assessed value of the property if that amount is lower	0.18-0.25%	Temporary surcharges of up to 10% for 2014 and 2015	0.1-0.3% of property value
Municipal tax valuation	Levied on the tax value of the real property.	Levied on the land value. A limit of 5 percent for the annual increase in payments of land taxes introduced in 2002.	The taxable value is 20-50 % of the market value.		Self-assessed market value	Levied on the cadastral value, which is adjusted every eight years with respect to the property's market value	
State tax		Property value tax 1% < DKK3,040,000 (taxable value) 3% > DKK3,040,000 (taxable value)					
State tax valuation		The taxable value is the lowest of (i) the assessed value as of Jan 1 of the current tax year; (ii) 105% of the assessed value as of Jan 1, 2001; or (iii) the assessed value as of Jan 1, 2002.					
Wealth tax	Net wealth tax abolished in 2006.	No wealth tax, but property value tax, see above	Municipal net wealth tax (individuals) 0% < NOK 1,000,000 0.7% > NOK1,000,000 State net wealth tax (individuals) 0% < NOK 1,000,000 0.4% > NOK1,000,000 The taxable value is 30% of the market value for the primary residence and 60% for secondary residences.	Net wealth tax abolished in 2007	No wealth tax (abolished in 1978)	Net wealth tax was reinstated for years 2011-2014. 0.2-2.5%	No wealth tax
Wealth tax valuation							
Tax on imputed rents							Taxable; rates increased from 0.6 to 0.7 percent for houses < €1,040k, from 1.55 to 1.8 percent, for houses above €1,040k

Sources: Deloitte international tax highlights, www.kpmg.com, National tax authorities websites, Sveriges Riksbank (2014), Citizens Information (Ireland).

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POTENTIAL GDP IN DENMARK¹

This paper looks at potential GDP, the output gap, and structural unemployment in Denmark.

Estimates of potential GDP vary across Danish institutions and international organizations. The first section examines the differences behind these estimates and the reasons for them. The second section illustrates how various methodologies used to derive potential output lead to different results in the Danish case. The last section proposes a benchmark in order to assess the various estimates of potential output.

A. Differing Estimates Across Institutions

1. Potential output estimates are the most common approach to assessing the aggregate capacity of an economy. However, there is no consensus on the best approach to estimating potential output, and it is difficult to assess estimates even *ex post*, given that potential output is unobservable.

2. The output gap is the deviation of actual GDP from potential GDP, expressed as a percentage of potential. Since it is the most frequent measure for the cyclical position of an economy, the output gap represents a key indicator for the design of macroeconomic policies. Estimates of potential GDP, which are contingent on the methodology and assumptions made, may result in a wide range of values for the output gap.

3. Danish institutions derive different estimates of the output gap. There appears to be consensus on the sign of the output gap, but a relatively large divergence about the magnitude of the cycle (Table 1). On average, estimates of the output gap diverge by 2.5 percentage points of GDP for the period 2007-2014, with the largest divergence in views in 2014.

Table 1. Output gap estimates
(Percent of potential output)

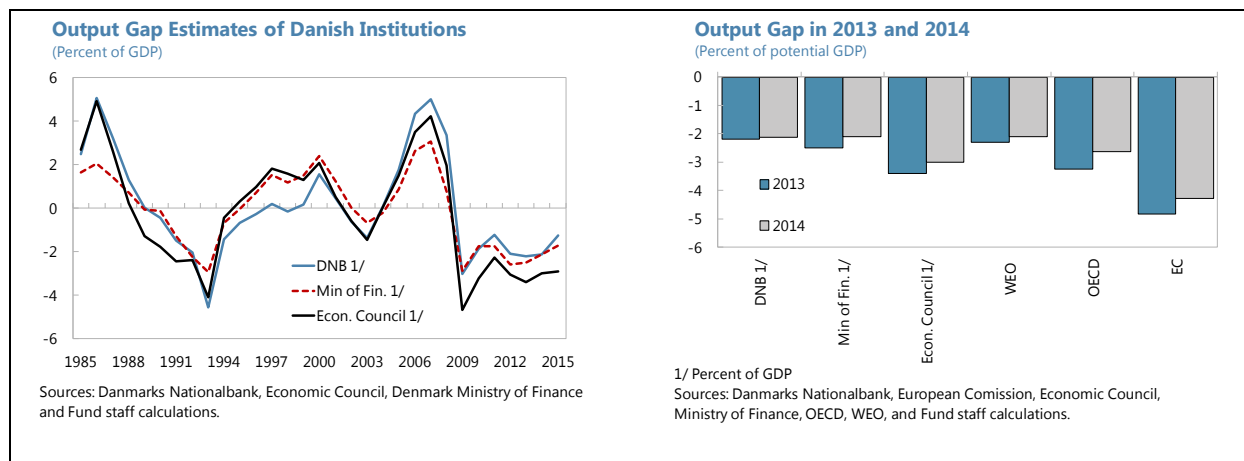
	2009	2010	2011	2012	2013	2014	2015
IMF	-3.1	-1.7	-0.7	-1.7	-2.3	-2.1	-1.6
Danmarks Nationalbank Output Gap 1/	-3.0	-1.9	-1.2	-2.1	-2.2	-2.1	-1.2
MoF Output Gap 1/	-2.9	-1.7	-1.7	-2.6	-2.5	-2.1	-1.7
The Economic Council Output Gap 1/	-4.7	-3.2	-2.3	-3.1	-3.4	-3.0	-2.9
EC	-4.7	-4.0	-3.6	-4.6	-4.8	-4.3	-3.6
OECD	-3.6	-2.7	-2.2	-3.0	-3.2	-2.6	-1.8
Standard deviation	0.8	0.9	1.0	1.0	1.0	0.8	0.9
Difference max-min (percentage points)	1.9	2.3	3.0	2.9	2.6	2.2	2.4

1/ Percent of GDP

Sources: WEO, DN, Ministry of Finance Denmark, Economic Council, AMECO, OECD, and Fund staff calculations.

¹ Prepared by Thomas Dowling and Aurora Mordonu (EUR).

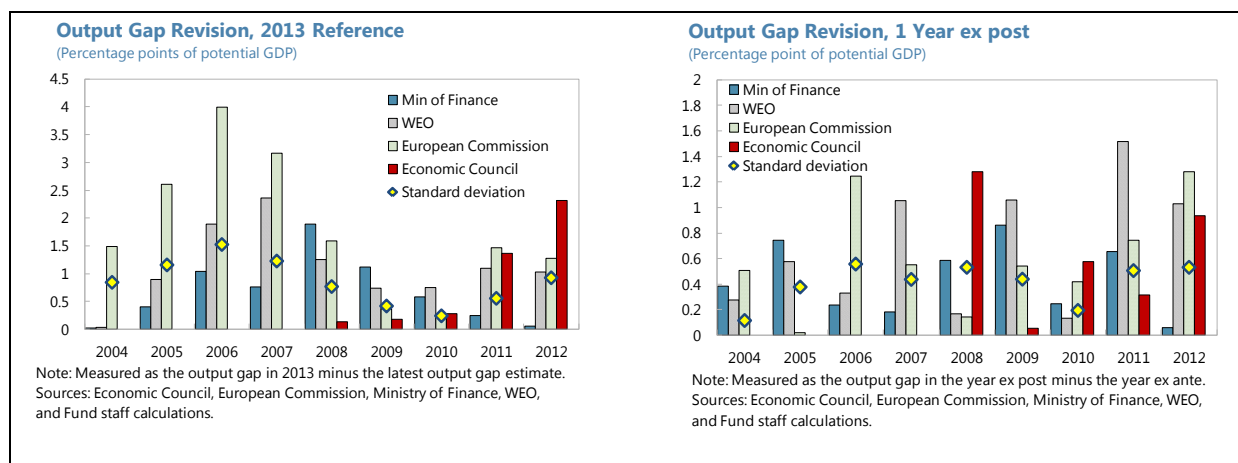
4. These differences imply large differences for the desirable fiscal policy. Using simple back of the envelope calculations, the 2.5 percentage point divergence in output gap implies a divergence of roughly 1.5 percentage points of GDP in the structural balance estimations.² This is based on a 0.59 elasticity of the structural balance with respect to a 1 percent change in the output gap (Girouard, N. and C. André, 2005).



5. However, there does not seem to be an institutional bias towards over/under estimating potential output. Over time, the institutions estimating potential output and output gaps for Denmark do not seem to have been systematically on the high or low side of the range of estimates. This may suggest that the methodologies used (see section II) rather than strong priors have been at the origin of the differences in estimates.

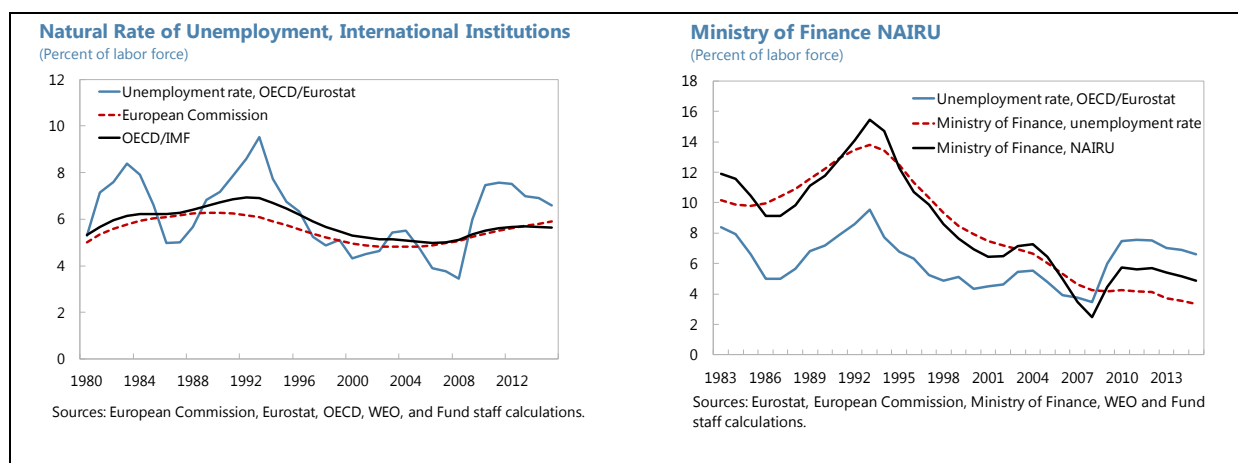
6. Revisions of the output gap were common across institutions and they were higher around the time of the financial crisis. Looking back from a reference point we choose the 2013 vintage available and one can notice that the pre-crisis period witnessed the largest revisions. This has to do mainly with a tendency to overestimate potential and assume that part of the cycle is structural. When changing the reference point and looking at the budget evaluation period, which is $t+1$ minus $t-1$, revisions are clearly concentrated in 2009. This is because the one year ex-post estimate of the 2009 output gap turned to be substantially more negative than the ex-ante hopeful view in 2008.

² An additional caveat to this simple calculation, which is just made for illustrative purposes, is that the output gap that informs the policy action is estimated prior to the fiscal year and not contemporaneously.



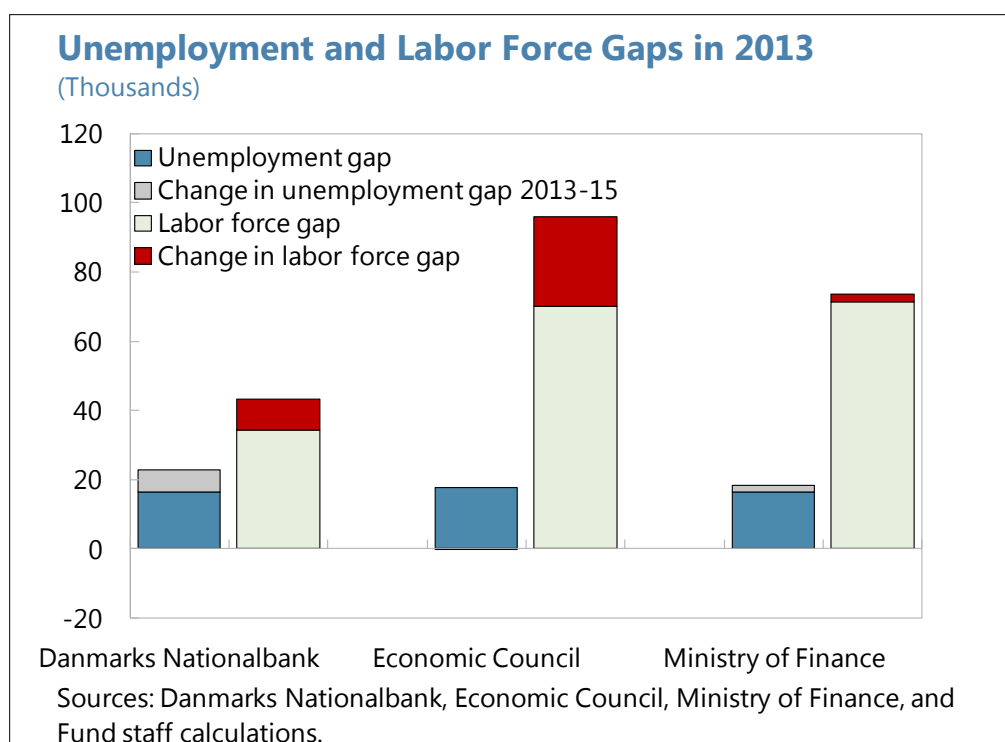
The output gap estimates differ significantly for the period 2013-2014/2015, mainly due to different views of the labor market

7. Estimates of the natural rate of unemployment also span a wide range of values. As with potential output, most of the divergence in estimates originate in various methodologies employed. What is more, there is no single definition of unemployment available, and the variety of data series broadens further the range of results and renders comparison difficult. The definition of unemployment used by the OECD and the European Commission (Eurostat), is different than the main one used by the Danish authorities that comprises unemployed persons insured against unemployment and unemployed non-insured persons claiming cash benefits.³



³ All three Danish organizations are using very similar definitions of net unemployment and labor force. Eurostat uses a harmonized across EU definition.

8. But the estimation of the structural labor force is the main source of disagreement over potential output estimations in the projections for 2013-2015. Three Danish institutions have three different takes on structural labor force. The Danmarks Nationalbank (DN) estimates a potential increase of 40,000 in the labor force if the economy normalizes, whereas the Economic Council finds the spare capacity in the labor market to be twice as large. The unemployment gap is estimated at around the same level by the three institutions.



9. One significant difference comes from the view the institutions have on the number of working hours. Another way to look at capacity in the labor market is to consider the number of working hours. The Economic Council has estimated that the number of working hours is currently below its structural level. Conversely, in DN's assessment, there is little potential for increasing average working hours. Based on surveys, DN considers that working hours fell from a high level during the overheating to a more normal level, and there is no significant mismatch between actual and desired hours.

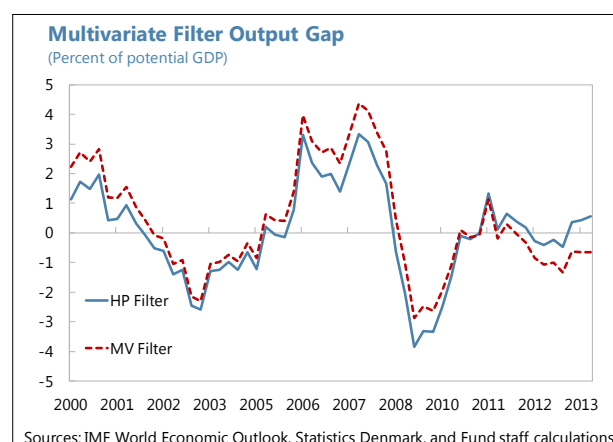
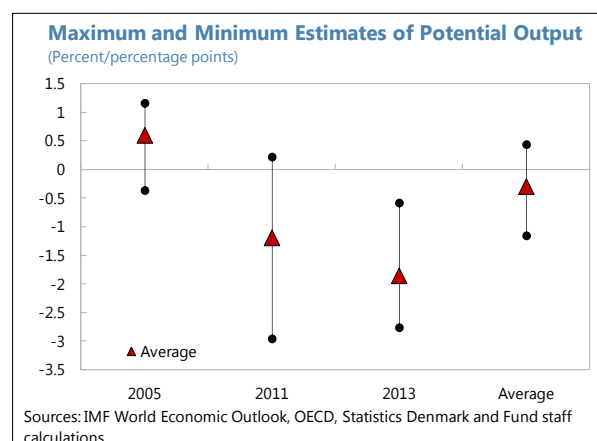
B. Different Methodologies for Estimating Potential Output

10. Potential output can be estimated using a number of methodologies, of which the most common are described in detail in Annex 1. Depending on the degree to which they rely on economic theory, methodologies can be divided into structural models that make use of economic theory and aggregate/statistical methods that rely on the statistical properties of the data.

11. In practice, there is a continuum of methodologies between fully structural and purely aggregate/statistical methods. The simplest way to estimate potential GDP is the HP filter that decomposes GDP into a trend and cyclical component. Despite well-known weaknesses (e.g., endpoint sensitivity), the HP filter remains popular due to its simplicity as well as ease of use. The various Multivariate Filter (MV) approaches add additional covariates that help identify the transitory part of GDP and employ different rules about frequency and amplitude of the cycle. Structural methods can be based on assumptions about the nature of shocks in structural VARs, on a DSGE approach, or on a structural model such as the Phillips Curve. The production function approach can be seen as a growth accounting exercise because output can be expressed as a weighted average of the factor inputs: labor, capital, and a residual TFP, but commonly uses filtering to obtain estimates of structural inputs and TFP.

12. Different methods lead to varying estimates of potential output. Panel 1 illustrates a range of estimates that can be obtained with an HP filter using different smoothing parameters, a production function approach employing different smoothing parameters and definitions of labor, and a multivariate approach. The output gap averages about 1.5 percentage points between the minimum and maximum estimates and is as high as 3.0 percentage points estimates and is as high as 3.0 percentage points; particularly during the crisis (specific comparison can be seen in the chart to the right). This corresponds to a 0.9 average percentage point difference in the structural balance, but could be as high as 1.9 percentage points.

13. Financial variables, absent so far from the methodologies calculating potential output, shed additional light on potential estimates. A multivariate filter incorporating information about financial variables shows



that potential output was influenced by the house prices. This led to an overestimation of potential output and underestimation of the output gap prior to the crisis. The unemployment rate also proved to be a good predictor of the potential output.⁴

C. Benchmarking the Authorities' Estimates

14. This paper proposes a benchmark to analyze the authorities' estimates. Despite the volatility of revisions and the sensitivity of estimates to the methodology and assumptions used, it is useful to ascertain which institutions tend to produce more consistent estimates. However, since potential is unobservable, we propose to let the average of the estimates produced by the various models in Panel 1 serve as an “agnostic” benchmark.

15. Historically, the variation in the output gap estimates displayed less deviation from the average than in the period following the crisis. Following the results of the analysis above, the crisis period put a strain on the models' ability to estimate potential and the large swings in real GDP were reflected in uncertainty and the dispersion of the estimates. The post-crisis period suggests that the models continue to have difficulty with the large boom and bust which is a known weakness of filtering. (See Panel 2). Given the similarities in the approaches taken by the Ministry of Finance and the Nationalbank, it appears that similar shocks drive the identification of the cyclical elements for the estimates. The decomposition done by the Economic Council seems to drive the post-crisis estimates further from the benchmark.

D. Conclusion

16. Estimates of potential GDP vary across Danish official institution and international organizations. The crisis period contributed to large revisions of the output gap by most of the institutions. For the period 2013–2015 there is a large divergence across institutions about the magnitude of the output gap. This stems in part from the estimates of the unemployment gap, but mainly from estimates of the labor force gap.

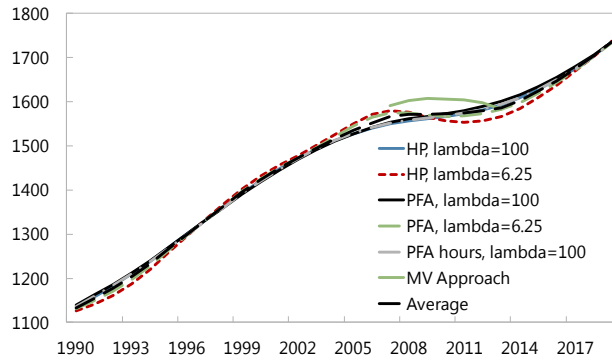
17. Estimates of potential output for Denmark are an important part of the toolkit for policy makers—but they come with a degree of uncertainty. As this paper illustrates, the use of different methodologies and assumptions can lead to different results. Under the HP, PFA, and multivariate approach, the choice of smoothing can just as reasonably produce a negative growth rate as well as a positive one. Likewise, output gap estimates, critical to fiscal policy, should also be carefully considered.

⁴ The multivariate filter (MV) approach is only estimated on 2007–2013 due to data limitations and that the model is not set up to estimate projections. The story did not change if the MV estimates were dropped from the averages and were therefore not included.

Figure 1. Estimates of Potential Output

Potential GDP, levels

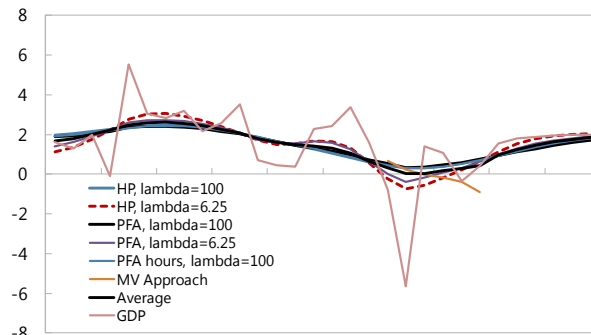
(Billions of DKK)



Sources: IMF World Economic Outlook, OECD, Statistics Denmark and Fund staff calculations.

Potential GDP, growth

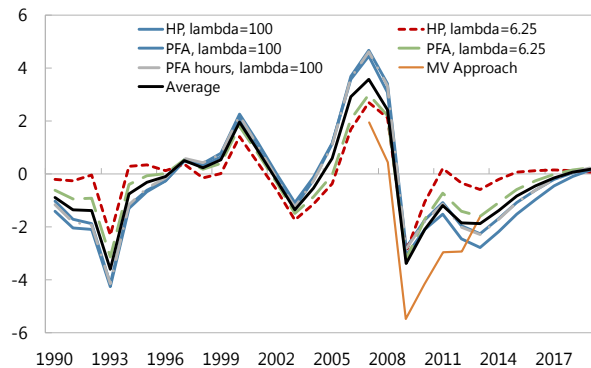
(Percent change)



Sources: IMF World Economic Outlook, OECD, Statistics Denmark and Fund staff calculations.

Output Gap

(Percent of potential GDP)



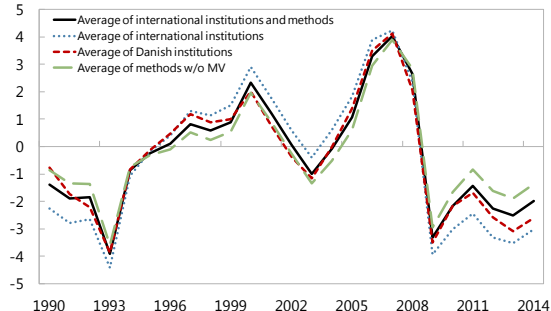
Sources: IMF World Economic Outlook, OECD, Statistics Denmark and Fund staff calculations.

Figure 2. Benchmark Analysis of Output Gap Estimates

Average output gap estimates have widened since the crisis...

Output Gap Averages by Group

(Percent of potential GDP)

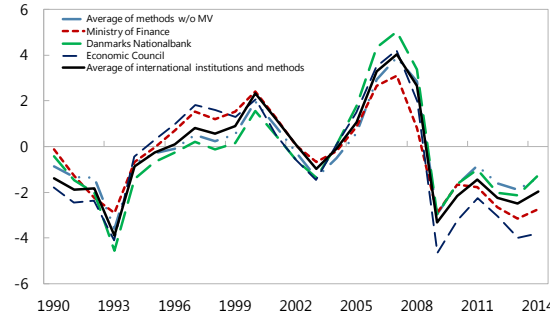


Sources: Danmarks Nationalbank, Economic Council, IMF World Economic Outlook, Ministry of Finance, OECD, and Fund staff calculations.

...while Danish estimates are likewise dispersing post-crisis.

Output Gap Averages by Institution

(Percent of potential GDP)

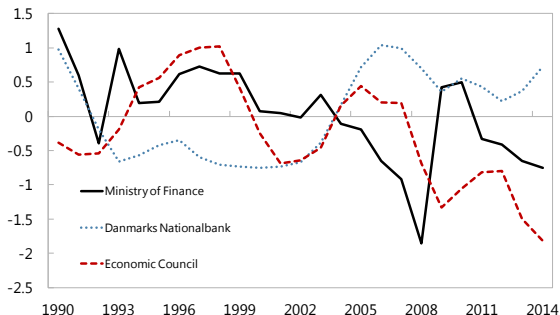


Sources: Danmarks Nationalbank, Economic Council, IMF World Economic Outlook, Ministry of Finance, OECD, and Fund staff calculations.

The authorities' differences from the benchmark appear to move around zero...

Annual Difference from Methods

(Percentage points)

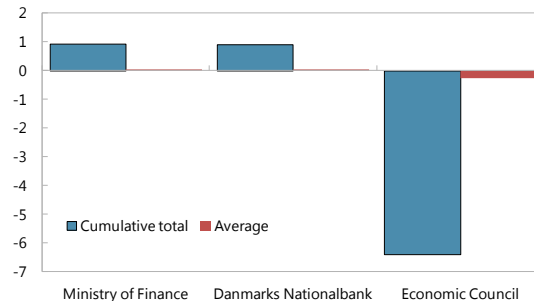


Sources: Danmarks Nationalbank, Economic Council, IMF World Economic Outlook, Ministry of Finance, OECD, and Fund staff calculations.

...but assessed over time, the Economic Council's estimates are further from the benchmark than the Ministry or Bank.

Cumulative and Average Difference from Methods

(Percentage points)



Sources: Danmarks Nationalbank, Economic Council, IMF World Economic Outlook, Ministry of Finance, OECD, and Fund staff calculations.

Annex 1.

1. Hodrick-Prescott Filter (Univariate)

The Hodrick-Prescott (HP) filter is one of the most widely used methods for decomposing time-series data into a trend component and a cycle component. Despite well-known weaknesses (e.g., endpoint sensitivity), the HP filter remains popular due to its simplicity as well as ease of use. Economically, it can be interpreted as the attempt to capture the underlying factors driving potential output—such as changes in factor inputs and their utilization, including hysteresis effects on the capital stock and structural unemployment—by looking simply at the GDP outcome itself. Following Hodrick and Prescott (1997):

$$y_t = g_t + c_t, \text{ for } t = 1 \dots T. \quad (1)$$

$$\min_{\{g_t\}_{t=-1}^T} \left\{ \sum_{t=1}^T c_t^2 + \lambda \sum_{t=1}^T [(g_t - g_{t-1}) - (g_{t-1} - g_{t-2})]^2 \right\} \quad (2)$$

where y_t is log growth decomposed into a trend component g_t and a cyclical component c_t in equation (1). Equation (2) describes how to obtain g_t where the first term is the sum of squared deviations from trend growth and the second term penalizes variability in the trend growth. λ refers to the degree of penalty incurred by the variability term and is restricted to be greater than zero. The choice of λ is critical and remains under some debate.

In this paper, the HP is estimated using annual data, using two levels for λ that yield estimates of potential output of different degrees of flexibility: $\lambda=100$, as suggested by Hodrick and Prescott (1997) and $\lambda=6.25$ as in Ravn and Uhlig (2002). The single input, GDP in constant prices, is projected to 2030 using a constant rate of growth after 2019 (which is the last year of WEO projections) to alleviate the endpoint bias problem.

2. Production Function Approach (PFA)

The production function approach derives potential output from a simple Cobb-Douglas production function with exogenously determined trend components. The model assumes constant labor and capital shares. Specifically,

$$Y^* = \theta K^{*\alpha} L^{*1-\alpha} \quad (3)$$

where Y^* is potential output determined by θ (total factor productivity), the smoothed real capital stock (K^*), smoothed volume of labor (L^*), and factor intensity α .

The PFA is estimated on annual data. The inputs are smoothed time series of employment, computed as the share of the labor force that is employed assuming that the rate of unemployment is at a level that will keep wage inflation constant (estimated separately), net capital stock, and total factor productivity (TFP), with factor intensity calibrated to the Danish economy. As for the HP filter, factor inputs are projected to 2030 to alleviate the endpoint bias.

The PFA, although stepping beyond the simple univariate approach, is not without problems. Importantly, the rate of growth of total factor productivity needs to be estimated. Following the standard approach in this case, we estimate the underlying rate of productivity growth by applying a HP filter to the Solow-residual using (unfiltered) factor inputs and production function (3).⁵ In line with the discussion above, we use two sets of calibrations for λ , 100 and 6.25, resulting in measures of productivity growth of different persistence.

3. Multivariate Filter (MV)

The state space model, an augmented version of Borio et al (2013), expands the HP Filter by adding additional covariates that help identify the transitory part of GDP, albeit without structural constraints. Reducing the state space model, the estimating equation is as follows:

$$y_t - y_t^* = \rho(y_{t-1} - y_{t-1}^*) + x_t\beta + \varepsilon_t^0, \varepsilon_t^0 \widetilde{ud} \text{ white noise } \sigma_0 \quad (1)$$

where y is real GDP, y^* is potential output, and x is a vector of observables which contains information on transitory variables. Built on the HP filter in a state-space framework — a standard method to estimate unobserved variables — this equation includes an autoregressive output gap term and additional transitory variables (without the transitory variables, the equation reduces to the HP filter). The advantage of this approach is that estimates from the HP filter can be used as a baseline benchmark for comparison. To produce comparable results with the HP filter, the signal-to-noise ratios for equation (1) and the HP filter are equated so that the frequency cutoff, namely the length of the cycles, matches. This is achieved by imposing a restriction on the variance such that:

$$\frac{\sigma_1^2}{\sigma_0^2} = \lambda_{HP} = \lambda_{SS} = \frac{\sigma_{SS}^2}{\sigma_0^2} \quad (2)$$

$$\text{such that } \frac{\text{var}(y_t - y_{(HP,t)}^*)}{\text{var}(\Delta^2 y_{(HP,t)}^*)} = \frac{\text{var}(y_t - y_{(SS,t)}^*)}{\text{var}(\Delta^2 y_{(SS,t)}^*)} \quad (3)$$

Estimation. While Borio et al (2013) employ a Bayesian approach; this paper uses maximum likelihood estimation (MLE) to estimate the model on quarterly data. ρ and β are estimated in a two-step procedure. First, the autoregressive parameter ρ is estimated by running an AR(1) regression on the output gap obtained from the simple HP filter. Then ρ is substituted into (1) and estimated using MLE. All time series are demeaned to reduce pro-cyclicality and differenced to account for unit roots. Specifically, the measurement equation becomes:

$$y_t - y_t^* = \beta(y_{t-1} - y_{t-1}^*) + \gamma_1 \Delta \text{unemployment rate}_t + \gamma_2 \Delta \text{house price}_t + \varepsilon_{4,t} \quad (4)$$

where $y - y^*$ refers to the output gap, *unemployment rate*, *house prices* is real house prices, and ε is a disturbance term.

⁵ NAIRU is obtained from the OECD. Employment at NAIRU is calculated, and then the entire series is smoothed using the HP filter.

DENMARK

To satisfy equation (2), the HP filter estimate is calculated using $\lambda=1600$ and the signal to noise ratio is computed. Then the model is adjusted by calibrating a restriction on the variance to produce the same signal to noise ratio as the HP filter to ensure full comparability.

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FISCAL MULTIPLIERS IN DENMARK¹

A. Introduction

1. **Fiscal policy plays a particularly important role in Denmark given the constraints on monetary policy from the pegged exchange rate and open capital account.** Also, the impact of fiscal measures on output tends to be amplified in a fixed exchange rate regime as monetary policy does not respond to offset the output impact of fiscal measures to balance it against other objectives as it would in a regime following a Taylor rule or an inflation target.
2. **The IMF's Global Integrated Monetary and Fiscal Model (GIMF) is used in this chapter to estimate the growth impact of different fiscal measures.** The model allows simulations to incorporate the effect of the monetary policy regime in evaluating the impact of fiscal policy. It also allows the assessment of alternative means of maintaining long-run fiscal sustainability to offset the initial fiscal measures (e.g., a reduction in transfers or an increase in labor taxes).
3. **Our simulations suggest that the Danish authorities' planned fiscal consolidation measures for 2015, based on the August 2014 budget outlook, would have a roughly neutral impact on growth.**²In light of the improving output gap, the Danish government planned to consolidate its fiscal position in 2015 through a range of discretionary measures including higher public investment, lower corporate taxes, and pension tax changes. At the same time, the composition of the consolidation package is important so that it will not have too negative impact on growth which could potentially derail the slow recovery. Our simulation further suggests the combined impact of the Danish government's plans would probably have a positive impact on growth in the short term, despite the overall budget deficit reduction.
4. **The chapter is organized as follows.** Section B presents an overview of the literature review of fiscal multipliers for Denmark. Section C describes the GIMF model as well as its calibration while Section D presents the results. Section E simulates the growth impact of a given fiscal stimulus with different financing and Section F illustrates a simulation of the current budget plan using the GIMF model. Section G concludes.

B. Literature Review on Multipliers for Denmark

5. **Fiscal multipliers for Denmark have been estimated using either econometric estimates or a structural model.** The former involves estimating a vector autoregressive (VAR)

¹ Prepared by Borislava Mircheva and Jiaqian Chen (EUR).

² The government policies announced in October 2014 are not incorporated in these simulations. The government is extending a 2013–14 window to convert certain pension assets from taxable to tax-free status upon withdrawal into 2015 as well as allowing the withdrawal of some pension assets paid in during the 1970s. A discounted rate of taxation applies to incentivize the conversion or withdrawal and generate current tax revenues.

model. However, the key challenge is to identify structural fiscal shocks from estimated reduced form regressions. In addition, the fact that fiscal multipliers vary across the business cycle makes it difficult to pin point the size of the multiplier at a particular point in time. Alternatively, fiscal multipliers can be estimated using a structural model, in particular, a DSGE model. This type of model has the advantage that agents are forward looking, where, the agents' decisions today will depend on the expectation of the future. This is particularly relevant, as in reality households' decisions indeed depend on their outlook of the economy.

6. VAR and other econometric estimates of fiscal multipliers for advanced economies are much higher for spending than for revenue measures. The average first-year multiplier for these countries is around 1 for government spending measures and much smaller for revenue side measures. Model estimated short-run fiscal multipliers are in general smaller than 1. However, they vary significantly depending on the policy instrument used and the openness of the economy, with more openness associated with smaller multipliers (Table 1).

7. One empirical study focusing on Denmark suggests that the fiscal multiplier of government spending is relatively large but rather short lived. Ravn and Spange (2012) use an SVAR to estimate the fiscal multiplier of government spending for Denmark to be around 1.3. The estimate is towards the upper range of the existing ones for the US which is between 0.8 and 1.5. However, the effect on GDP is only significant for 1 year. This relatively large initial impact reflects the fixed exchange rate framework. In addition, the authors estimate the fiscal multiplier associated with tax measures to be 0.8, where the effect on GDP appeared to be significant for 2 years.

8. A DSGE model for Denmark estimates a multiplier for government spending at around 0.6 on impact. Pedersen (2012) uses the Danish National Bank's large scale DSGE model to study the effect of a 1 percent of GDP temporary increase in government purchases of goods and services. The increase in spending is initially financed by issuing debt and is subsequently stabilized by means of (lump sum) taxes. The higher government purchases increases real output of around 0.6 percent in the first quarter, which diminishes to zero after 6 quarters. The short-lived nature of the effect could be partly driven by the forward looking agents. In this model, the increase in government debt (due to government expenditure) is assumed to be stabilized by lump sum taxes in the future. As a result, the forward looking agents reduce today's (private) consumption in anticipation of lower future wealth. In addition, higher government expenditures put an upwards pressure on domestic produced good prices, which leads to a deterioration of competitiveness of Danish firms and in turn dampens the effects of fiscal stimulus.

C. Description and Calibration of the GIMF Model

9. The IMF's GIMF is a multi-country dynamic stochastic general equilibrium (DSGE) model. It features forward-looking households and firms optimizing their objective functions subject to given constraints. The model also includes frictions such as sticky prices and wages, real adjustment costs, liquidity constrained households, along with finite planning horizons of households, leading to an important role for monetary and fiscal policy in affecting macroeconomic conditions.

Table 1. Summary of selected papers

Source	Methodology	Data sample	Fiscal shock	Country	Fiscal multipliers
Empirical approaches					
Blanchard and Perotti (2002)	Structural VAR	Quarterly data 1960:Q1 - 1997Q4	Government spending Taxes	United States	1 quarter 0.8 1 year 0.5 2 years 0.5 3 years 1.1
Batini, Callegari and Melina (2012)	Nonlinear threshold VAR	Quarterly Data 1985Q1 - 2009Q4	Government spending Taxes	Euro area	1 quarter 0.4 4 quarters 0.1 2.1 2.6 2.5 -0.1 -0.2 -0.1 -0.4 Cumulative 1 year 1.3/0.4 3 year 1.7/0.1
Perotti (2005)	VAR	Quarterly data 1939Q1 - 2008Q4	Government spending	United States	1.4/-0.7 23.9/-1.6 Peak
Ramey (2011)	VAR	Quarterly data 1939Q1 - 2008Q4	Government spending	United States	0.6 - 0.8
Ravn and Spangse (2012)	SVAR	Quarterly data 1971Q1 - 2011Q2	Government spending Taxes	Denmark	1 quarter 1 year 1.3 0.5
Model-based					
Barrell, Holland, and Hurst (2012)	NI-GEM model with one-year shock		Consumption Benefits Indirect tax Direct tax Consumption Benefits Indirect tax Direct tax Consumption Benefits Indirect tax Direct tax Government spending	Denmark	0.5 0.1 0.1 0 0.6 0.1 0.1 0.1 0.1 0.2 0.2 0.1 0.2 1.1
Christiano, Eichenbaum, and Rebelo (2009)	DSGE model		Government spending	United States	No zero bound is binding Zero interest bound is 3.7 binding
Danmarks Nationalbank	DSGE model		Government spending	Denmark	1 year 0.8 2 year 0
OECD (2009)	OECD global model		Government expenditure (consumption and investment)	10 OECD countries plus monetary policy	1 year 0.9 2 year 1.3
Sources: Mimeshima, Poplawski-Ribeiro and Weber (2014) and fund staff calculations.					Income tax cuts euro area 0.6 1

10. Both spending-based and revenue-based fiscal measures are non-Ricardian in the model. This allows contractionary fiscal policy to dampen the level of economic activity in the short run while lower government expenditure encourages higher private investment in the longer term. In addition, GIMF enables us to model Denmark as a small open economy with pegged exchange rate to the euro, while allowing the real effective exchange rate to fluctuate depending on the behavior of inflation.

The non-Ricardian features in the model, in order of importance, are:

- i. Overlapping generations (OLG) households who value government debt as part of their wealth. These households plan and smooth their consumption over time and their marginal propensity to consume from a stock of wealth depends on taxes or transfers.
- ii. Liquidity constrained households who do not have access to capital markets. These households consume their post-tax labor income as well as any transfers they receive from the government in full every period.
- iii. Multiple distortionary taxes that affect decisions by households and firms such as: labor income, corporate income and consumption (VAT) taxes.

11. Fiscal policy is modeled using multiple tax and expenditure measures, where the government respects its long-term inter-temporal budget constraint. Government spending can take the form of consumption, investment expenditure or lump-sum transfers, to either all (general) households or targeted towards liquidity-constrained households. Government investment spending augments public infrastructure, which depreciates at a constant rate over time. Taxation includes labor and corporate income taxes as well as consumption (VAT) taxes.

12. We consider a 3-region version of the GIMF model, based on Denmark, the euro area, and the rest of the world. To calibrate the model, we use variety of data sources. For instance, we use national accounts ratios, tax revenues for the different components, general lump-sum transfers, and trade decomposition data for 2012. The debt-to-GDP ratio is chosen to be 40 percent (equal to Denmark's medium term value). The share of liquidity-constrained households is set to be 25 percent, similar to other advanced economies, however lower than the rest of the world.³ We calibrate the degree of nominal rigidity in Denmark as similar to the euro area, which is 50 percent higher than the rest of the world owing to the persistence of inflation.⁴

³ The share of liquidity constrained households does not play an important role in permanent shocks (which are used in our simulations). Liquidity-constrained households cannot save, and hence are forced to consume all of their current income. Therefore, in a forward looking model with permanent shock, these agents are not forced to adjust their consumption as they would be in the case of a temporary shock.

⁴ Changing the degree of nominal rigidity does not significantly affect the simulation results.

13. We estimate the impact of a permanent 1 percent of GDP improvement in the budget balance through one of seven fiscal instruments. On impact, the fiscal instrument will change by 1 percent of GDP. The government debt level will decrease as a result of the fiscal consolidation as well as the interest rate payment, in turn, this provides additional fiscal space to reverse as much as possible the change in the fiscal instrument being used in the consolidation process. Moreover, we assume that government announcements of any fiscal consolidation are credible, in the sense that households and firms believe the fiscal adjustments are permanent.

D. Fiscal Multipliers in Denmark

14. The estimated multipliers differ across the different measures and over time. The results are presented in Table 2 below with the effect on output over the first five years. It should be kept in mind that even though the consolidation is permanent, the change in the fiscal instrument is temporary because the lower debt level implies lower debt service and interest payments, as explained in the previous section.

15. Fiscal consolidation via government consumption and investment are both associated with higher multipliers although they are larger for investment. Government spending has a direct impact on aggregate demand, while other instruments have to enter through indirect channels on trade, consumption and investment. Government investment has larger and more persistent multipliers due to the loss of productivity from a lower stock of public infrastructure, in addition to the direct effect on real GDP. For both measures, there are two effects offset the impact on GDP: crowding out and leakage. However, given the permanent nature of the shock, the crowding out effect is small. At the same time, because Denmark is a “very” open economy, lower government spending translates immediately to a reduction in import which in turn offsets the direct impact of lowering government spending on GDP—leakage effect. In general, our results are in line with the findings by the Denmark Nationalbank’s DSGE model. However, our estimates suggest that the impacts are more persistent, which is driven by the structure of the model and the underlying rigidities embedded in it.

16. Government transfers to liquidity constrained households or to the general public have lower multipliers in the model. Unlike cuts in government consumption and investment, fiscal consolidation with general transfers does not have a direct impact on aggregate demand. A cut in government transfers targeted towards the liquidity constrained households has a more pronounced and immediate impact on their income, and subsequently consumption, as they consume their present income. At the same time, when government decreases transfers to OLG households, these agents respond by borrowing in the short-run in order to finance their consumption, which they prefer to smooth. Therefore, for general transfers, the impact on output is not large because of the small share of liquidity constrained agents in the economy.

17. On the revenue side, the degree of economic distortion determines the multipliers for the different taxes. Corporate income taxes lead to lower investment and therefore long-run decreases in the level of capital stock and lower capacity. Labor income taxes decrease households’ incentives to supply labor which also reduces the productive capacity of the economy. Moreover,

they also reduce the consumption level of the liquidity-constrained households, while the effects on non-credit constrained household are smaller owing to the temporary nature of the tax cut. Consumption taxes have the lowest impact on GDP, as they affect consumption demand and not the factor of production. It is also interesting to note that the effect of higher capital and labor taxes on output accumulates over time as the factor supply is adjusted gradually in response to the tax change. As a comparison, the impact of lower government consumption and transfers is higher in the first year.

18. The estimated effects on GDP are smaller and less persistent if the fiscal consolidation is temporary. A one-off reduction in government consumption of 1 percent of GDP leads to 0.65 percent reduction in GDP on impact but becomes negligible in the second year.

19. Fiscal consolidation has a larger effect on GDP if it is immediately and fully credible. However, the effect of such a policy fades relatively quickly. At the same time, multipliers have smaller but longer impact when economic agents do not perceive fiscal policy as immediate and fully credible.

Table 2. Fiscal Multipliers Based on 1 Percent of GDP Permanent Change in the Budget Balance (Percent deviation from baseline)

	Year 1	Year 2	Year 3	Year 4	Year 5
Government Investment	0.86	0.81	0.71	0.67	0.76
Government Consumption	0.71	0.57	0.33	0.05	-0.10
Targeted Lump sum Transfers	0.24	0.19	0.05	-0.14	-0.24
General Lump sum Transfers	0.19	0.10	-0.05	-0.24	-0.33
Corporate Income taxes	1.00	1.14	1.00	0.90	1.00
Labor Income Taxes	0.29	0.48	0.62	0.71	0.81
Consumption Taxes (VAT)	0.29	0.29	0.19	0.10	0.00

Sources: Fund staff calculations.

E. Fiscal Stimulus: Financing Matters

20. This section simulates the growth impact of a given fiscal stimulus with different financing options. We consider a one percent increase in government consumption or investment financed by either a reduction in lump sum transfers or an increase in the labor tax 3 or 5 years after the stimulus package is being implemented. It is important to note that these re-financing options are pre-announced at the time of implementation of the stimulus. In other words, households fully anticipate the stimulus package and that it will be fully financed in the near term.

21. Our simulations suggest that the growth impact is dampened by the anticipated re-financing but varies considerably depending on the measure and timing. As households anticipate the future consolidation, the positive growth impact from the initial stimulus is dampened as household save more. Financing the stimulus with higher labor tax would have the lowest

dampening effect on growth in the short run, which will grow over time. This is consistent with our findings in the previous section, where the fiscal multiplier associated with labor income tax is small initially and becomes larger over time. At the same time, financing through lump sum transfers will have a larger and immediate effect on growth which diminishes over time.

Scenarios	2014	2015	2016	2017	2018	2019	2020
Public consumption							
<i>finance in 3 years with ...</i>							
general transfer	0.52	0.43	0.38	0.38	0.43	0.52	0.57
labor tax	0.57	0.33	0.14	-0.10	-0.24	-0.38	-0.48
<i>finance in 5 years with ...</i>							
general transfer	0.52	0.43	0.38	0.43	0.43	0.43	0.48
labor tax	0.57	0.43	0.29	0.14	0.05	-0.10	-0.19
Public investment							
<i>finance in 3 years with ...</i>							
general transfer	0.76	0.76	0.81	0.86	1.00	1.28	1.62
labor tax	0.76	0.71	0.62	0.48	0.48	0.57	0.76
<i>finance in 5 years with ...</i>							
general transfer	0.76	0.81	0.81	0.86	1.00	1.24	1.57
labor tax	0.81	0.81	0.76	0.71	0.76	0.86	1.00

Sources: Fund staff calculations.

F. The August 2014 Budget Outlook in a DSGE Model

22. This section presents a simulation of the discretionary measures proposed by the government for the 2015 budget.⁵ The simulations are consistent with the August 2014 Budget Outlook and do not incorporate the additional policy measures announced in October 2014. The proposed budget for 2015 includes a mixture of measures, comprising reductions in public investment and lump-sum transfers and increases in public consumption and personal income taxes, implying an overall decrease in the government deficit by 0.4 percent of GDP. These measures can be best mapped into fiscal instruments available in GIMF as follows:

- An increase in public consumption by 0.09 percent of GDP;
- A reduction in public investment by 0.13 percent of GDP;
- A reduction in lump-sum transfers by 0.19 percent of GDP;

⁵ Budget Outlook 2, August 2014 <http://uk.fm.dk/publications/2014/budget-outlook-2-august-2014/>

- An increase in personal income taxes by 0.22 percent of GDP;
- A reduction in corporate taxes by 0.12 percent of GDP; and
- An increase in VAT (indirect tax) by 0.1 percent of GDP.

23. The GIMF simulations suggest that these combined measures would raise output by 0.05 percent relative to the baseline. The short run growth impact is dominated by the reduction in corporate tax which affects investment positively and has the largest fiscal multiplier attached. However, in the long run, the growth impact is negative as the effects from higher income tax start to kick in and offset the positive short run growth impacts. This suggests that the government has room to consider further consolidation in 2015.

Table 4. Estimated Growth Impacts from the Planned Discretionary Measures for 2015
(Percent deviation from baseline)

	2015	2016	2017	2018	2019	2020
Discretionary measures	0.048	0	-0.143	-0.285	-0.333	-0.38

Sources: Fund staff calculations.

G. Conclusion

24. The model suggests a ranking of fiscal instruments in terms of their growth impact, where government investment has the largest multiplier. This is the case both on impact and in the medium term. Government investment is followed by government consumption and transfers. On the revenue side, corporate income taxes have the largest multiplier, followed by labor income taxes and consumption taxes.

25. In addition, financing of the fiscal stimulus measures matters, where increasing the labor tax seems to have the least dampening effects in the short run. However, the long run impact can be significant as it takes time for the labor income tax to affect the economy. At the same time, lowering the lump sum transfers has larger dampening effects in the short run, but the effects diminish relatively quickly.

26. A simulation of the proposed discretionary measures for the 2015 budget reveals that the considered measures would have an initial positive effect on output. The combination of fiscal instruments simulated with the GIMF model would increase GDP marginally by 0.05 percent in the first year, suggesting that the government has room to consider further consolidation in 2015. In the medium to long term, the negative effect of higher income taxes would dominate, resulting in a negative effect on output.

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PRODUCTIVITY IN DENMARK¹

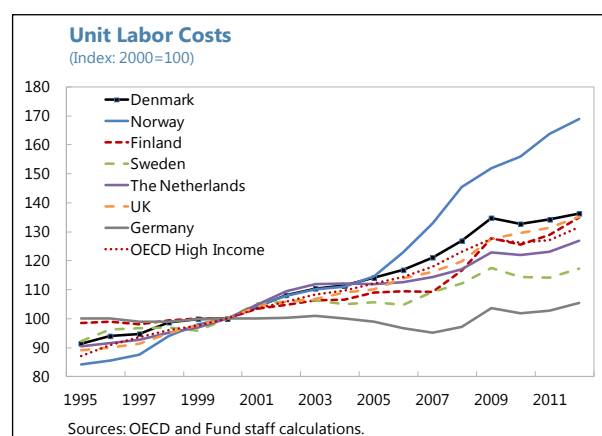
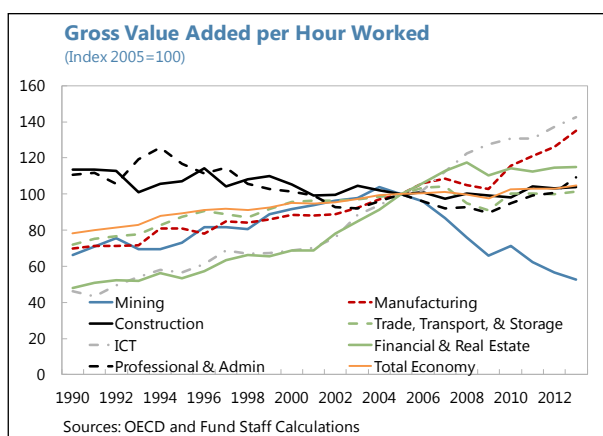
Productivity in Denmark has slowed and price competitiveness has been eroded. Nevertheless, the terms of trade have been favorable and business environment rankings are high. However, there is room for improvement in order to strengthen competition and productivity growth. To address the challenge of weak productivity growth, the government appointed a Productivity Commission which developed a set of recommendations in three main areas: (i) strengthening competition, business dynamics, and internationalization, (ii) improve the quality of education and its value for the labor market, and (iii) creating a framework for enhancing innovation and effectiveness in the public sector. The government's first response to the Commission's recommendations was addressed in Denmark's Growth Package 2014 but many of the remaining recommendations deserve further consideration.

A. Introduction

1. Productivity growth in Denmark has slowed. Productivity has grown only modestly in the past decade and a half, both compared to peers and historical trends.

2. The government established the Danish Productivity Commission in 2012 to address the causes of poor productivity and present suggestions on how to improve it. The Commission released its final report in early 2014, with more than one hundred specific recommendations in three main areas: (i) strengthening competition, business dynamics, and internationalization, (ii) improve the quality of education and its value for the labor market, and (iii) creating a framework for enhancing innovation and effectiveness in the public sector.

3. This chapter examines Denmark's productivity growth challenge and recommendations from the Commission. The next section looks at the productivity growth trend



¹ Prepared by Borislava Mircheva (EUR).

in Denmark. Section C describes the main recommendations made by the Productivity Commission. Section D discusses the government's response to these recommendations and section E concludes.

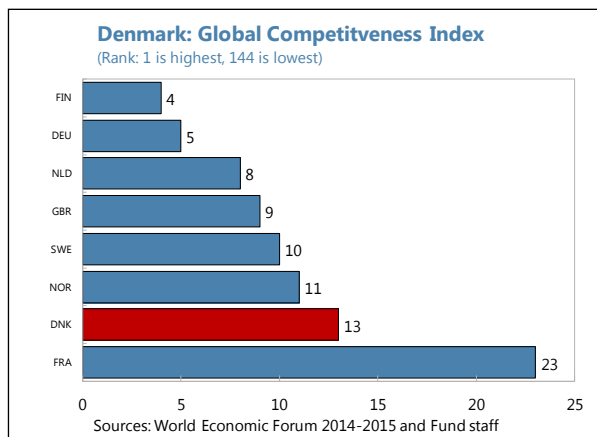
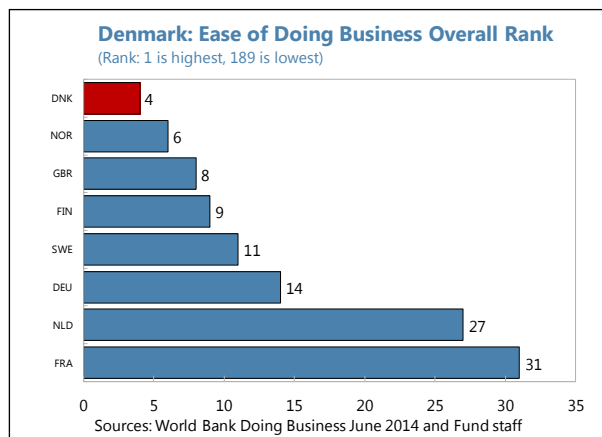
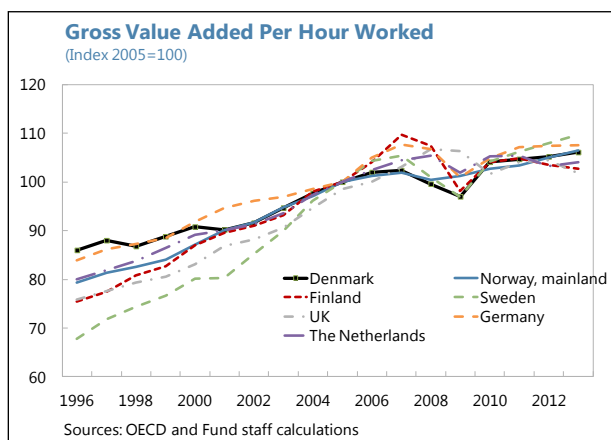
B. Productivity in Denmark

4. Labor and total factor productivity growth (TFP) have slowed in the last decade and a half. TFP growth has improved somewhat in recent years, but it is still below historical trends. Labor productivity is also lagging behind peers. However, capital deepening has contributed positively to productivity.

5. Price competitiveness has been eroded by low productivity, but other factors counter this. Price competitiveness

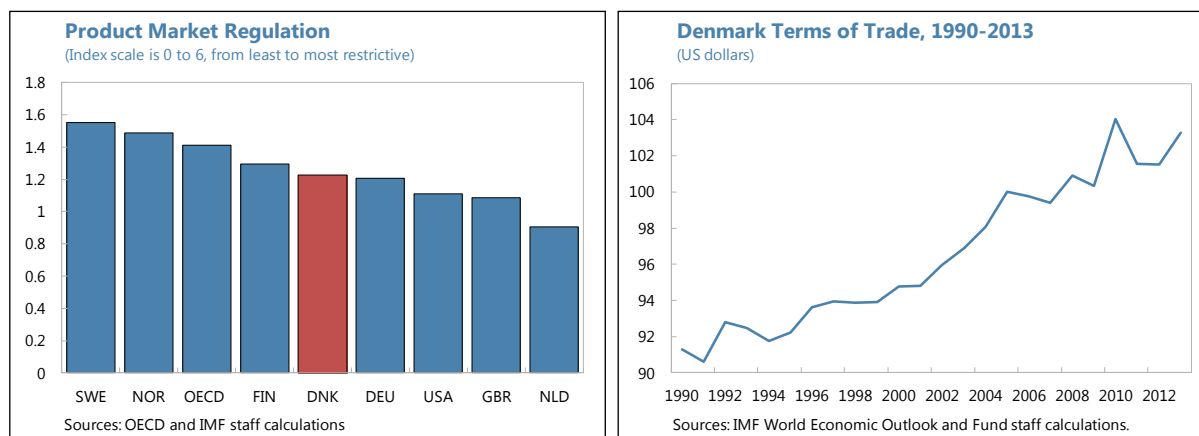
has been eroded relative to peer economies due to low productivity and high wage costs. However, the terms of trade have been improving substantially over many years, and wage growth has moderated recently.

6. Nevertheless, business environment rankings are high. The Global Competitiveness Index of the World Economic Forum for 2013 ranks Denmark 13th, while the World Bank ranks Denmark 4th in its Doing Business Indicator. Non-price competitiveness is also reflected in the persistent trade and current account surpluses.



7. However, there is room for improvement in order to strengthen competition and productivity growth. Weaker competition in some areas may have contributed to low productivity growth, particularly in non-trade services. For example, strict zoning laws and idiosyncratic standards handicap foreign firms wishing to enter the Danish market. Competition is limited in the public

sector according to OECD data. Specifically, regulations are more restrictive than many peers in four areas: (i) public ownership; (ii) governance of state owned enterprises; (iii) other barriers to trade and investment; and (iv) barriers to trade facilitation.



C. Recommendations of the Productivity Commission

8. To address the challenge of weak productivity growth, the Productivity Commission has developed a set of recommendations in three main areas. Many of these have parallel OECD or other recommendations which are also discussed in the section below:

Strengthening competition, business dynamics, and internationalization

Improve the quality of education and its value for the labor market

Creating a framework for enhancing innovation and effectiveness in the public sector

Strengthening Competition, Business Dynamics and Internationalization

9. A dynamic and competitive business environment is key to achieving higher productivity. The Commission notes that productivity growth is weakest in those parts of the services sector in Denmark which are not subject to international competition and makes recommendations to remedy this.

10. Removing regulatory restrictions which limit competition and restrict access to the domestic market. Ownership restrictions can be removed. For example, only pharmacists can own pharmacies and only Danish lawyers can own law firms. In addition to ownership, the rules can be relaxed on the size of new stores as well, as research shows that larger stores provide higher productivity gains.

11. Strengthening the competition law and aligning it with best practices in the EU. For example, for a company to be punished for violating the Danish competition law, the Danish Competition Authority (DCA) has to prove that the violation was done knowingly and intentionally.

12. The OECD concludes that regulatory barriers in Denmark are restrictive. Ownership, zoning and size regulations, as well as national standards that differ from international ones restrict entry in several sectors, which hampers competition. Therefore, removing regulations that handicap completion and harmonizing national standards with international ones in order to promote foreign firm entry would help bolster competition and productivity.

13. Prioritizing public spending towards productive investment. A large share of public spending takes the form of income transfers in order to create a social safety net. However, if those transfers are too high they may weaken the incentives to work. Similarly, if the cost of financing through taxes is too high, this may reduce incentives to work or invest in a business. Therefore, not only the level but also the composition of expenditure is important for productivity. Against this background, the Commission recommends that public resources are prioritized more toward productive investment, which would be important in order to secure high quality investments in education, health and infrastructure.

14. Employing tax policy to enhance productivity. The Commission notes the body of research supporting the view that corporate and personal income taxes are more harmful to productivity than consumption and property taxes. Therefore, the Commission recommends that taxes are reformed with more emphasis on land and real estate taxes than on corporate and personal income. It also recommends that a panel of experts is appointed to analyze the issue of taxation of entrepreneurs compared to salaried employees. The Commission further notes the importance of corporate taxes not deviating from neighboring countries.

15. The OECD has a similar perspective as the Commission regarding tax reform and productivity. Lower marginal taxes on higher incomes and higher taxes on property could help improve productivity. It would also be helpful to improve the structure of environmental taxes to raise their efficiency.

16. Infrastructure should provide net economic benefits: digital, transport, and other types of infrastructure can provide a strong foundation to productivity growth. In Denmark, digital infrastructure is developed by private companies. At the same time, transport infrastructure is developed with public funds and sometimes the costs exceed the benefits to society. The Commission concluded that one in every five projects since 2002 had an economic benefit that is low or even negative. Therefore, it recommends that public funds are invested only in infrastructure that is economically viable. Investment in infrastructure projects that do not have a positive cost-benefit analysis should be based on additional analysis of the project's social benefit.

17. Reducing traffic congestion. Denmark experiences considerable congestion on the main transport arteries as well as public transport. The Commission recommends that variable pricing of

public transport could be used to address this, making it more expensive during peak hours and cheaper otherwise. Similarly, road toll pricing could be increased during rush hour. Work underway at the Danish Technical University could help quantify these costs.²

Improve the quality of Education and its Value for the Labor Market

18. Educational institutions could be given incentives to offer education aligned with labor demand. Higher education institutions receive a subsidy for every student who completes a program. This incentivizes a larger number of students irrespective of the economic value of their education. The subsidy does not depend on the grade point average or earning potential of students. The Commission recommends that educational institutions reorient education toward fields that are in demand and with a higher earning potential for graduates. Reforms of this sort could require sweeping changes in the governance and funding model of higher education institutions. Subsidies provided to universities could be calibrated to the field of study based on the earning potential of that field or by rationing the slots by major. Furthermore, cooperation between businesses and education institutions could help students find productive employment (e.g., through internship programs or research cooperation).³

19. Providing financial incentives to students to choose training with high employment potential. Studies undertaken by the Commission suggest that only about 5 percent of students in Denmark choose their field of study based on expected employment and income, compared to about 30 percent in the UK. Students in Denmark receive free education and other financial assistance which is roughly twice as high as in Norway and three times higher than in Sweden. The Commission recommends that the financial incentives for students be targeted towards stimulating the recipients to choose fields of study with higher employment potential. Specifically, the direct subsidies received by students could be replaced by government guaranteed loans in order to incentivize students to view education as an investment and consider employment potential more seriously when choosing a field of study.

20. Providing shorter tertiary education targeted at labor market needs. The majority of graduates in Denmark can conclude their education in five years and obtain a master's degree. However, for some jobs a three year Bachelor's degree may be sufficient. For other jobs, gaining experience on the labor market before or during the educational training may be more beneficial. The Commission recommends that higher education is restructured in a way so as to allow for customization of the duration and content in order to meet labor market demand.

² For example, evidence from the Texas Transport Institute shows that extra traffic time per year due to congestion in the Washington and Los Angeles metro areas is 67 and 61 hours longer per commuter. <http://d2dtl5nnlpr0r.cloudfront.net/tti.tamu.edu/documents/ums/congestion-data/national/national-table-all.pdf>

³ The OECD estimates that the share of higher education sector research financed by the private sector is 3.4% in Denmark against a 6.3% OECD average.

21. Providing students with relevant information on employment options. When students have to choose courses during their education program, usually they do not have information regarding the employment opportunities related to those courses. For this reason, the Commission recommends that published material be made available regarding the labor market relevance of the different training courses which are offered. For example, publishing figures on employment and salary potential for the different fields of study after graduation would be useful.⁴

22. Strengthening secondary schools. Even though some initiatives have already been taken, Denmark is lagging behind in international comparisons of skills and almost every fifth student fails in secondary schooling in Danish and in mathematics. PISA scores are below average for math and only at the OECD average in reading and science in spite of very high expenditure. In order to address this issue, a teacher training reform was adopted in 2013 and an elementary school reform will come into force in the fall of 2014. The Commission recommends that schools increase the focus on students' academic achievements in national tests, exam grades, and continuing education after graduation as well as greater transparency of school results. The Commission further recommends that teacher training be made more stringent and that alternative teacher training programs are made available.

Creating a Framework for Enhancing Innovation and Effectiveness in the Public Sector

23. Working with less bureaucracy. The Commission recommends that when new rules are issued they replace existing ones or amend them, and that the government should evaluate the stock of rules on a regular basis to consider whether they are all still relevant. Local governments can apply for an exception from certain central government regulations if they can provide an argument for better use of resources in local service provision. The Commission recommends that an independent unit carries out analysis of these local experiments and successful experiments should influence the regulations for all local governments.

24. Aiming for results to citizens. The Commission recommends more efforts to collect and publish information on the use of resources, production and performance of public services, and the systemic publication of implementation of benchmarking results for productivity and efficiency. Specifically, performance management and yardstick competition as well as the benchmarking method by Wittrup et al. (2013) as described in Sorensen (2014) could be used.

25. Broad and flexible public sector collective agreements. The Commission finds that collective agreements in the public sector are more rigid than in the private sector, and it recommends more flexibility in the public services agreements. Specifically, it recommends that

⁴ Information on earning by occupation is readily available on the website of Statistics Denmark, but this is not proactively disseminated to pre-college students.

employees and local union representatives reach local agreements in order to adhere to the specific needs of the different professional categories as well as labor market demand.

26. Creating better links between employee skills, performance, and salary. Salary increases in the public sector are negotiated at the collective level and all employees usually receive the same percentage increase. The Commission recommends that a tighter link is created between employee skills, performance, and pay. This can be achieved through the introduction of flexible individual bargaining as well as rewards to employees and teams for special efforts and achievements. Furthermore, the Commission concluded that there is further scope for the use of performance-related pay where pay raises are negotiated at the individual level.

27. Making it more attractive to bid for public projects. Detailed public requirements as well as a range of specific requirements often deter effective competition. The Commission recommends that public entities prepare tender documents in a manner that is attractive to as many qualified suppliers to bid as possible - including foreign suppliers. This would require an emphasis on functional contracts where the final task is specified rather than focusing on a detailed description of how the contractor would carry out the work. In addition, a central unit could be established to assist local governments with public-private partnerships as well as innovative ways to work with the private sector. Such central units could in addition promote innovation and competition. Finally, the use of social clauses, such as requiring the company to hire a certain number of young people or unemployed, should be avoided.

28. The OECD recommends for Denmark to simplify the legislation on public procurement and increase the use of e-procurement to lower transaction costs and make the process more uniform. However, public authorities in Denmark find procurement rules difficult to apply, particularly because complaints can impose large costs on the civil servants involved in the process. A working group was set up in 2013 in order to suggest improvements of the procurement legislation. Its report on how to achieve clearer, simpler and more flexible legislation is due in mid-2014 and should be consulted by the Commission. In addition, the OECD also finds that a number of barriers exist in the participation of SMEs in the public procurement process. Such barriers are related to the limited knowledge of procurement rules, extensive documentation requirements and tight deadlines, making the bidding process costly for firms with limited expertise. Against this background, greater use of e-procurement would help cut transaction costs and make the process more uniform.

D. The Government's Response

29. The government's first response to the Commission's recommendations was addressed in Denmark's Growth Package 2014. The government has proposed legislation that would implement reforms in several areas covered by Commission recommendations. Also, many of the recommendations of the Commission are in line with policies that the government has already put into place. For example, a phased reduction of the corporate income has been put into place that will reduce the corporate income tax from 25 percent to 22 percent between 2013 and 2016.

30. The independence of the Danish Competition Council has been increased. The board of the Council would be replaced by professional economic and legal experts who have substantial experience in the areas of business, competition, and consumer matters without representatives of business groups. Furthermore, investigations related to competition by the Competition and Consumer Protection Agency would no longer be subject to government review. Such investigations would be fully independent and referred directly to the newly established board which would be able to issue reports related to competition without political approval.

31. Non-competition clauses would be removed from employment contracts in order to increase labor mobility and improve competitiveness. No-hire agreements in labor contracts would be prohibited. In addition, the legislation on non-competition and non-solicitation clauses would be harmonized so that the rules for white collar workers would apply to all salaried employees.

32. National technical standards would be replaced by international ones. The high voltage regulations as well as the standards for lighting conditions in work areas would be simplified and brought in line with international standards in order to increase competition in the areas of electrical installations, power facilities, and lighting. Specifically, 109 national standards would be removed and replaced by international ones. It has further been decided to modernize the approval procedure for construction projects involving contact with drinking water and to streamline the procedure for technical construction permits.

33. Strengthening Danish export promotion efforts, increasing effective organization, and better coordination. A new strategy for export promotion and economic diplomacy is being developed. In addition, a number of actions are implemented in the planned fiscal policy for 2015, including a yearly investment of DKK 80 million on growth advisors and strengthening agency cooperation.

34. Streamlining business regulations: Competition would be increased by removing entry barriers and increasing transparency in the following areas: (i) better regulation of the real estate agent profession; (ii) analyses of competition in the market for legal services; (iii) gradual liberalization of the maritime pilot area in 2020; (iv) transparency in mortgage services; and (v) liberalization of a number of smaller regulated professions. In addition, efficiency gains totaling DKK 3.3 billion should be achieved by 2020 in the utility services sector: (i) 1.3 billion in electricity, (ii) 0.5 billion in district heating; (iii) 0.2 billion in waste disposal; and (iv) 1.3 billion in water and sanitation. A further analysis of the efficiency of the gas sector is being undertaken as well as a separate cost-analysis of electricity infrastructure.

35. Simplify and streamline industry specific business regulation. Better regulation would be achieved through: strengthening the transparency in the legislative process by enforced assessments of new regulation, targeting to reduce the regulatory burden of business by DKK 2 billion by 2020 (0.1 percent of GDP). Additional streamlining of regulations in specific sectors would be achieved as follows:

Environmental permit system: The requirement for environmental permit for businesses not subject to IE directive would be removed. Enterprises would be able to apply for a standard permit with a set of fixed rules for common activities. This would affect approximately 5,800 businesses. In addition, the new regulation would be based on the levels of emission rather than the scale of production.

Food industry: The removal of Denmark specific regulations for foodstuff would reduce the regulatory burden on businesses by DKK 74 million yearly. The elimination of a special foodstuff license would reduce regulatory burdens additionally by DKK 18 million yearly. Furthermore, meat control would be made more efficient and reduce costs by DKK 29 million by 2020.

Administration: The recording and accounting of VAT and taxes, particularly for small businesses, would be simplified and automated by connecting bank data with the accounting system of the businesses. Furthermore, analysis of the possibility to loosen the auditing requirements for smaller businesses as well as the development of digital accounting (connecting filing systems to the authorities) would be undertaken.

36. Removal of ownership restrictions. A limited deregulation of community pharmacies would be undertaken. However, the ownership restriction would not be removed. At the same time, the agricultural law would be modernized to remove ownership barriers and the requirement for a single person to own the company. The new law would also expand the range of approved types of companies that can acquire agricultural property, which would attract additional investors.

37. Regulation of the telecommunications industry. An analysis of barriers restricting competition in broadcasting was undertaken, and possible actions to support greater competition would be examined.

38. Improving transport infrastructure. The weight limit on 7-axled road trains would be increased from 54 to 56 tons. In addition, the scheme for modular road trains would be prolonged to 2030 and the road network for modular road trains would be expanded by DKK 74 million. As a result, transport companies would be able to utilize larger economies of scale by increasing their capacity.

39. Regulation on warehouse requirements in order to increase competition in the market. The requirements for high-bay warehouses would be harmonized with regulations and requirements of the neighboring countries.

40. Decreasing companies' administrative costs in building projects. As part of the efforts to improve local business cooperation with the local authorities, the government would work with municipalities to establish one-stop-shops for companies. A large number of municipalities have already adopted, or are in the process of adopting, this reform.

41. Transferring construction permits between municipalities and setting a time limit for processing of construction projects. Currently, building permits are granted at the municipality level, which can result in different requirements for the same permit in different municipalities. The government is currently analyzing how the process can be centralized. In addition, a target for case-processing times is being implemented for building and environmental permits. The target is set to reduce case-processing times by one third by 2016.

42. Building construction pre-approval and building electricity, plumbing and sewer services. The authorities are currently examining how fire safety in new constructions can be authorized based on floor plans. In addition, the government is undertaking a modernization of the authorization scheme for electricity, plumbing, and sewer services.

E. Conclusion

43. The Danish economy can boost its productivity growth. The Commission has made a set of recommendations in areas where productivity growth can be improved. Many of the recommendations made by the Commission are in areas where the government has been making gradual reforms over time. Further reforms were included in the Growth Plan 2014 as a first response to the recommendations, which is a step in the right direction. However, the remaining recommendations by the Commission deserve further consideration in order to ensure that all options to boost productivity growth are utilized.

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