



SWEDEN

SELECTED ISSUES PAPER

August 2014

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SELECTED ISSUES

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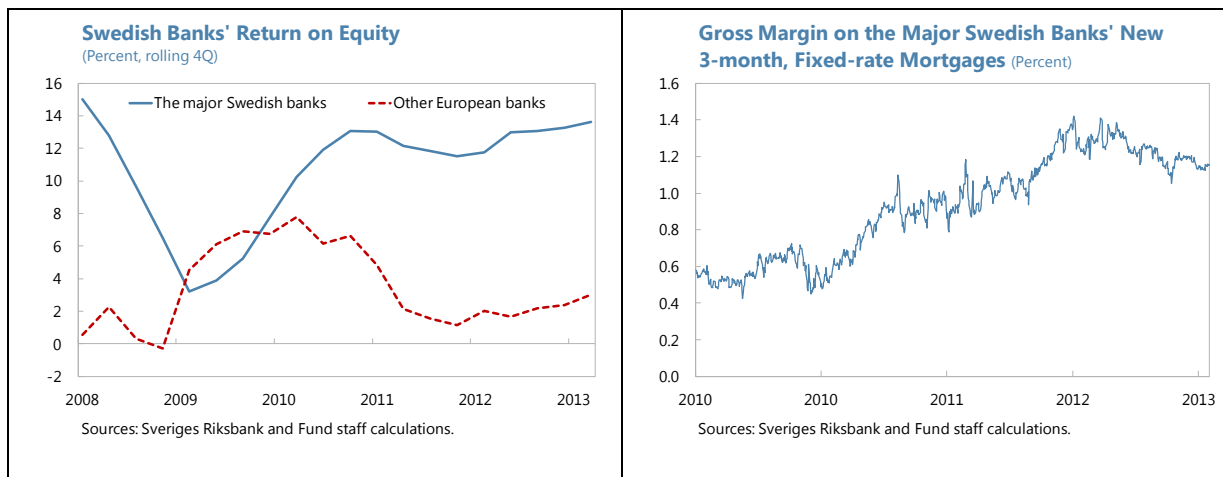
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MACROPRUDENTIAL POLICIES IN SWEDEN— AN OVERVIEW¹

Sweden's banking system meets most standard measures of financial soundness. But with its very large and wholesale-dependent banking sector, high and increasing household debt, and resurgent house price growth, additional measures are needed to contain mounting financial stability risks. On the supply side, this means continuing to strengthen capital and liquidity requirements. However, theoretical and empirical evidence points to a need to also limit credit demand, including through effective steps to increase the rate of mortgage amortization.

A. Financial Stability Assessment—An Update

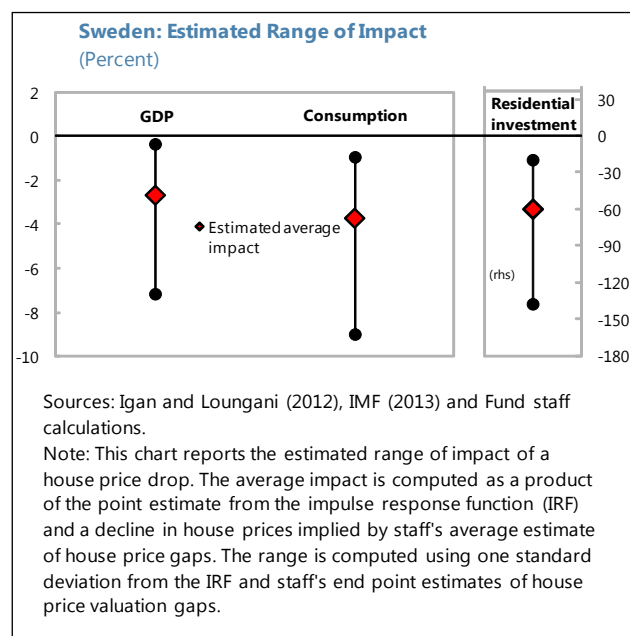
1. After a brief period of uncertainty at the beginning of the crisis, the Swedish banking system performed well. The May 2013 Riksbank stress tests suggest that major banks can absorb direct loan losses triggered by large macroeconomic shocks. This resilience stems from banks' strong earnings as well as a history of low default and loss-given-default rates. While the return on equity is still lower than during the pre-crisis period—reflecting, in part, the low interest rate environment—the gross margin on new mortgages now exceeds historical values and Swedish banks remain profitable compared to many European peers.



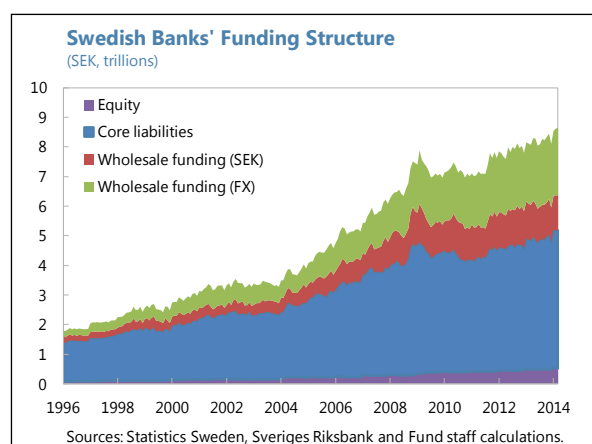
2. However, Swedish banks are very large and wholesale-dependent, and high and increasing household debt and resurgent house prices add to financial stability risks.

¹ Prepared by Jiaqian Chen.

- In the context of household debt at around 175 percent of disposable income and standard indicators placing house prices 20 percent above fundamentals or higher, an unexpected drop in housing values would affect banks not only through rising non-performing loans (NPLs) and uncertainty in financial conditions, but also through household deleveraging and its knock-on effects on investment and corporate balance sheets. Staff calculations suggest a housing price correction in Sweden by 20 percent would reduce GDP by 2.6 percent, consumption by 3.7, and residential investment by 60 percent.²



- The Swedish banks increasingly finance their liabilities from wholesale funding sources.³ The share of wholesale funding has increased from around 20 percent in 1996 to above 40 percent in 2014, with over 60 percent of the wholesale funding obtained in foreign currency. This practice introduces significant market and foreign liquidity risks that could quickly become systemic. Moreover, it is difficult to exclude scenarios where these risks could add to potential problems related to household credit (see above). Such a combination would put Sweden's banks under significant stress, with potentially drastic consequences throughout the Nordic region (see IMF 2013).



² See IMF (2013) for details of the calculations. Similarly, a recent panel study of Danish households by Andersen, Duus, and Jensen (2014) finds a positive and significant correlation between pre-crisis household leverage and the reduction in consumption during the crisis.

³ Note: wholesale funding consists of all sources of bank funding except deposits and equity.

3. In principle, a range of potential macroprudential policy tools can be applied to address these and related risks. In particular, the European Systemic Risk Board (ESRB) emphasizes measures that operate on the banking (supply) side—such as strengthening capital buffers and liquid funding structures—and tools to influence credit demand.

Table 1. ESRB Recommendations: Objectives and Macroprudential Instruments

Intermediate Objective	Suitable Macro-Prudential Instruments
Prevent excess leverage ratio, strengthen core tier-1 equity buffer	Countercyclical capital buffer Systemic risk buffer Increased capital conservation buffer Increased own funds requirements Leverage ratio
Mitigate and prevent excessive sectoral credit growth and leverage (e.g. real estate)	Sectoral RWs Sectoral LGD floors Sectoral LTV limits Sectoral LTI or DSTI limits
Mitigate and prevent excessive maturity mismatch and market illiquidity	Liquidity charges LTD limits Liquidity buffers NSFR Other stable funding requirements
Sources: ESRB and Fund staff calculations.	

B. Recent Reforms

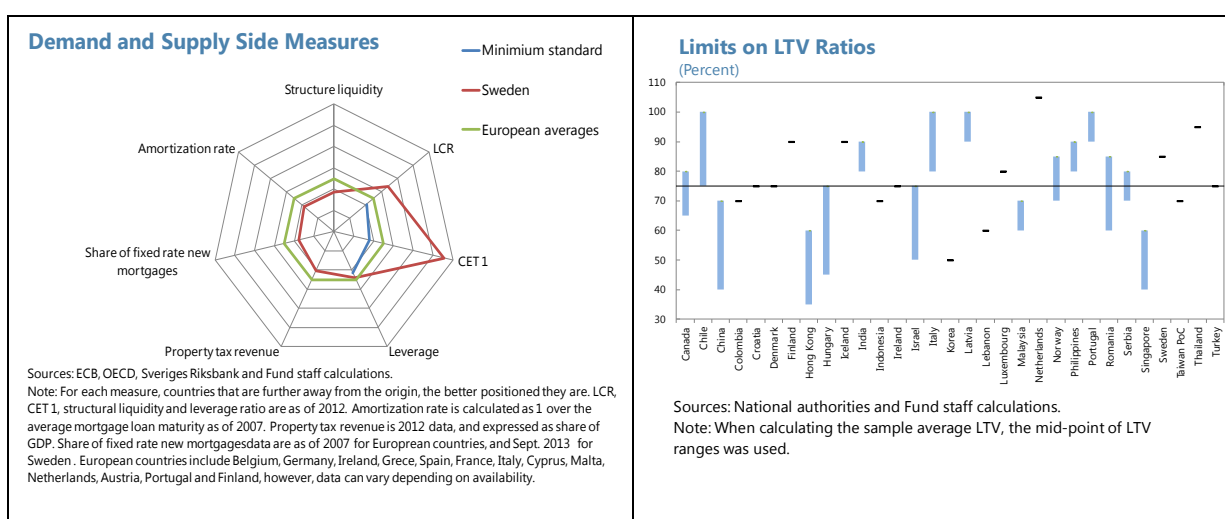
4. Recent policy reforms in Sweden have focused on the supply side. The authorities have strengthened CET1 capital levels exceeding Basel III requirements ahead of many peers. At the same time, leverage ratios have remained at levels similar to other European banks (see text figure). Similarly, Swedish banks have been asked to fully implement the Liquidity Coverage Ratio (LCR) while the Riksbank's measure of the banks' structural liquidity position is still below the average of European peers.⁴ Moreover, banks' reporting standard needs to be further improved, as transparency requirements are part of the Basel III regulations (Ingves, 2014).⁵

5. The track record regarding demand-side measures is weaker. Compared to many other European countries, Swedish households enjoy a low property tax rate along with income tax-deductible mortgage interest rate payments. For example, the Finnish government recently

⁴ The Net Stable Funding Ratios (NSFRs) of some Swedish banks have been revised upwards following the new Basel III guidance released in early 2014. However currently only two banks report the NSFR.

⁵ See http://www.riksbank.se/Documents/Tal/Ingves/2014/tal_ingves_140528_eng.pdf.

announced plans to reduce the share of mortgage interest expenses that can be deducted to 50 percent by lowering it 5 percentage points per year until 2018. At 85 percent, the LTV requirement introduced in 2010 is relatively high, and much higher compared with countries outside the Europe. In addition, some European countries are planning to reduce LTV ratios; for example, in the Netherlands, the Wijffels commission recently recommended a reduction of the LTV to 80 percent. Moreover, the average Swedish mortgage has a very long amortization period. To the extent that mortgages are amortized at all, a typical loan with a LTV ratio below 75 percent matures within 43 years. However, many mortgages are not amortized at all. Introducing minimum amortization requirements was a key policy recommendation in the 2013 Article IV consultation (see Table 2). Other countries have taken measures to limit the maximum amortization periods. For instance, the Monetary Authority of Singapore introduced a cap on maximum tenure of new mortgage loans at 35 years in 2012.



Supply Side: Progress But Not Complete

6. At around 4.1 percent, the leverage ratio for Swedish banks has improved little in recent years, despite significant improvements in risk weighted capital ratios.⁶ Banks' risk weighted capital ratios have doubled since 2008, while the core Tier 1 capital as share of total assets has improved by 27 percent. Although the leverage ratio is above the minimum requirement listed by the Basel III committee, it remains low compared to the U.S., where the largest banks are asked to have leverage ratios no less than 5 percent.⁷

⁶ The leverage ratio is defined according to Basel III.

⁷ Recent studies, including, Admati and Hellwig (2013), Chen and Vera (forthcoming), Miles and others (2013), suggest that the "optimal" bank leverage could be higher than what is proposed in Basel III.

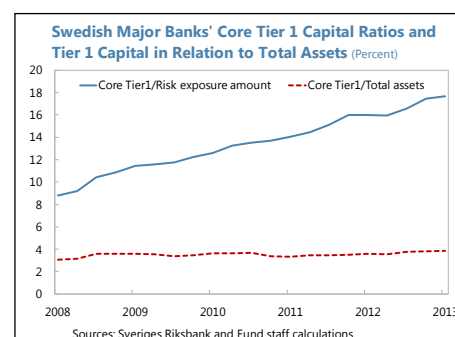
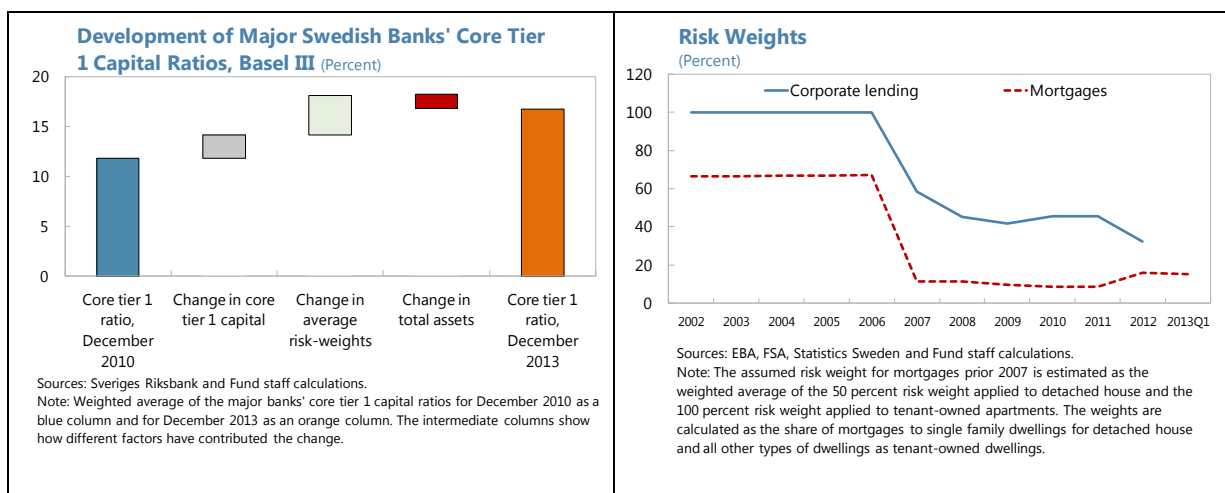


Table 2. Enhancing Financial Stability: Progress Compared to the 2013 Article IV Recommendations

Intermediate Objective	2013 Article IV Key Policy Recommendations	Specific Measures	Actions
Prevent excess leverage ratio, strengthen core tier-1 equity buffer	Fortify capital buffers	Major Swedish banks should ensure that they have a CET 1 ratio of at least 12 percent on 1 January 2015	Completed
	Improve reporting standards	The major Swedish banks should report their leverage ratios at least once a quarter starting no later than 2014Q2	In Progress (three out of the four major banks report on a quarterly basis)
Mitigate and prevent excessive sectoral credit growth and leverage (real estate)	Improve capital buffer for mortgage lending	Gradual movement to 35 percent mortgage risk weights under the standardized Basel III approach	Pending (FSA and the Riksbank discussed the possibility to raise risk weights to 25% in 2014.)
	Strengthen credit monitoring	Collect disaggregated credit data at the household level	Pending (FSA has concluded its 3rd loan survey.)
	Redesign tax incentives to balance tax treatment of household assets	Phased-in reform to lower tax deductions of mortgages; increase residential property taxation	No action
	Raise mortgage portfolio quality	Introduce minimum amortization requirements on new mortgages. Further strengthening the LTV requirement.	Voluntary amortization plans only. LTV cap remains at 85 percent.
Mitigate and prevent excessive maturity mismatch and market illiquidity	Raise liquidity standards	The major Swedish banks' LCR should amount to at least 100 percent, also in EURO and USD separately	Completed
	Raise funding stability standards	Implement 100 percent of the Basel III NSFR by 2018	No time path to Basel III recommendation
	Improve foreign currency liquidity	Making banks internalize costs of maintain FX reserves by implementing targeted charges, or bank reserve requirements	No action
	Improve reporting standards	The major Swedish banks should report their NSFR at least once a quarter	Pending (only one bank publishes)
	Improve reporting standards	The major Swedish banks should report their LCR in Swedish Kronor at least once a quarter	No action (The Swedish banks already report the LCR of all currencies together and separately in EUROs and USD)

Sources: IMF Sweden Article IV Consultation 2013 and Fund staff calculations.

7. Core Tier 1 capital ratios are relatively high and have been improving further—but primarily driven by changes in risk weights. While Swedish banks' core Tier I capital buffers improved from 11.8 to 16.8 percent between December 2010 and December 2013—significantly above major EU bank's average of 12.3 percent—only 0.9 percentage points came from higher capital while changing average risk weights contributed 4 percentage points.⁸



8. Reductions in corporate loan risk weights played a key role in this regard.⁹ In anticipation of the current minimum requirement imposed by the FSA in May 2013, major Swedish banks increased the risk weights on mortgages to above 15 percent during 2012. However, simultaneously, banks lowered the average risk weights on corporate lending from 45 percent to 32 percent. A simple calculation suggests that this shift in risk weights alone—without any change in equity buffers—improved the average risk weighted capital ratio by about 3½ percentage points, similar to what was observed in the Swedish banking system between 2010 and 2013.¹⁰

9. This points to the fact that risk weight adjustments and leverage are related. Increasing the risk weight on mortgages has two implications: for any given lending portfolio, it reduces the total amount of lending banks can make with a given capital base, and it tilts banks'

⁸ Core Tier 1 capital, in fact, increased by 2.3 percentage points, but 1.4 percentage points were offset by the change in total assets.

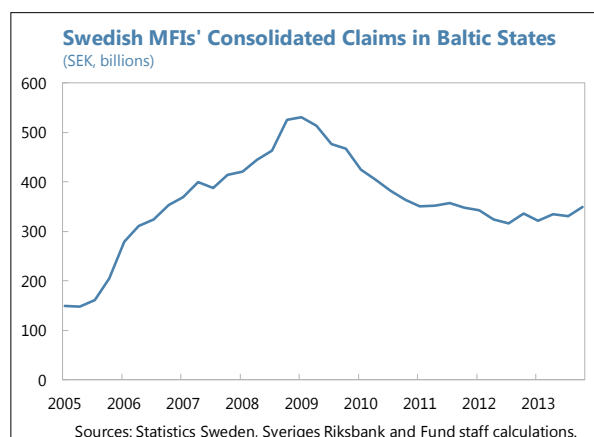
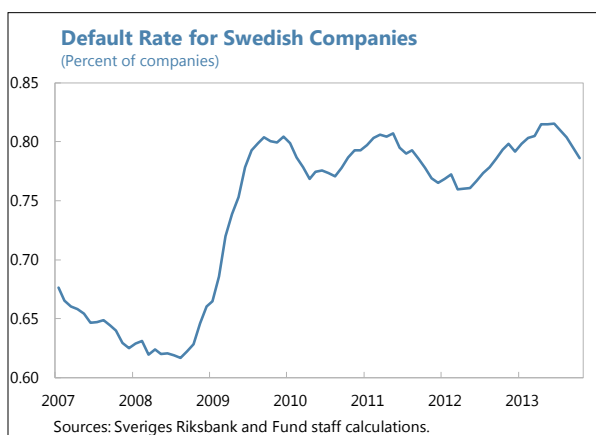
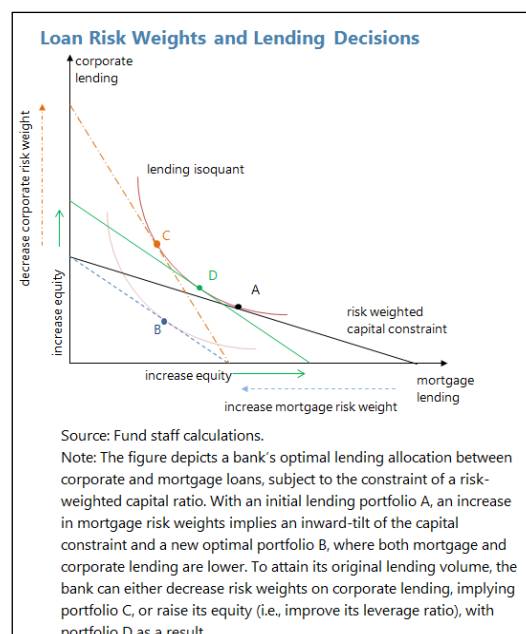
⁹ In this paper, risk weights are calculated as the ratio between risk weighted assets and exposure.

¹⁰ Consider a representative bank with a leverage ratio of 3 percent and a lending book consisting of only corporate and mortgage loans, with a 60 and 40 percent share, respectively. If this bank adjusts the risk weights for corporate and mortgage lending from about 45 and 8 percent to about 32 and 16 percent—an adjustment roughly representative of the change in risk weights observed for Swedish banks between 2010 and 2012—this implies a 1.7 percentage points improvement in the risk weighted capital ratio. Moreover, if the bank's lending book shifted to a 40 and 60 split between corporate and households, its risk-weighted capital ratio would improve by about 3½ percentage points without any change in the leverage ratio.

lending incentives toward other lending (see the shift from point A to point B in the text chart). To attain their original level of lending, banks can either decrease risk weights on other lending categories (e.g., corporate risk weights—see point C), or raise additional equity (see point D). The latter would improve banks' leverage ratio and involve a lending portfolio with a smaller proportion of the relatively riskier assets (mortgage lending). By contrast, unless reductions in corporate risk weights reflect changes in the underlying riskiness, the former would represent a distortion in lending.¹¹

10. With little evidence that the Swedish corporate risk profile improved recently, strengthening the leverage ratio would have advantages. Adaption of advanced internal rating-

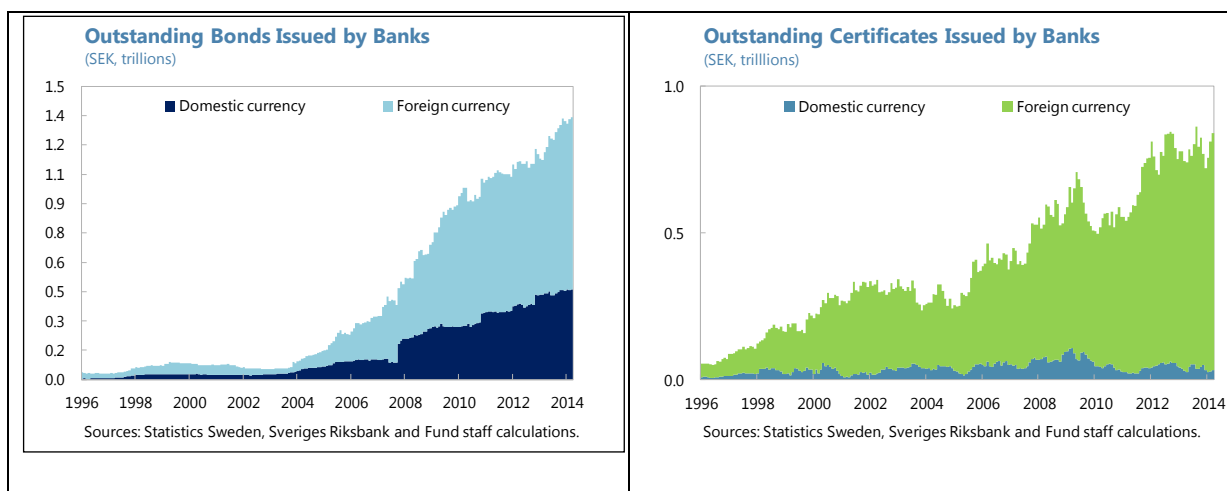
based (IRB) models contributed to the reduction in corporate risk weights; while there is little evidence suggesting the underlying riskiness of corporate lending has changed. In fact, corporate bankruptcy rates have been relatively stable after the crisis and the Baltic exposure of Swedish banks has declined well before 2012. This would suggest limited scope to preserve overall lending levels given higher mortgage risk weights through decreasing corporate risk weights. Instead, an improvement in the leverage



¹¹ Conceptually, one can think of a bank as a portfolio investor who chooses its investment allocation subject to a capital requirement constraint. Any changes in the risk weights, effectively makes it more costly to lend to that particular sector which in turn will affect bank's investment allocation (see the text chart above). In a simple example, with risk weight shifting from, say, 45 and 8 percent for corporate and mortgage lending, respectively—an adjustment roughly representative of the change in risk weights observed for Swedish banks between 2010 and 2012—to 32 and 16 percent would imply an increase in bank lending to the corporate sector by 50 percent while mortgage lending would drop by 75 percent

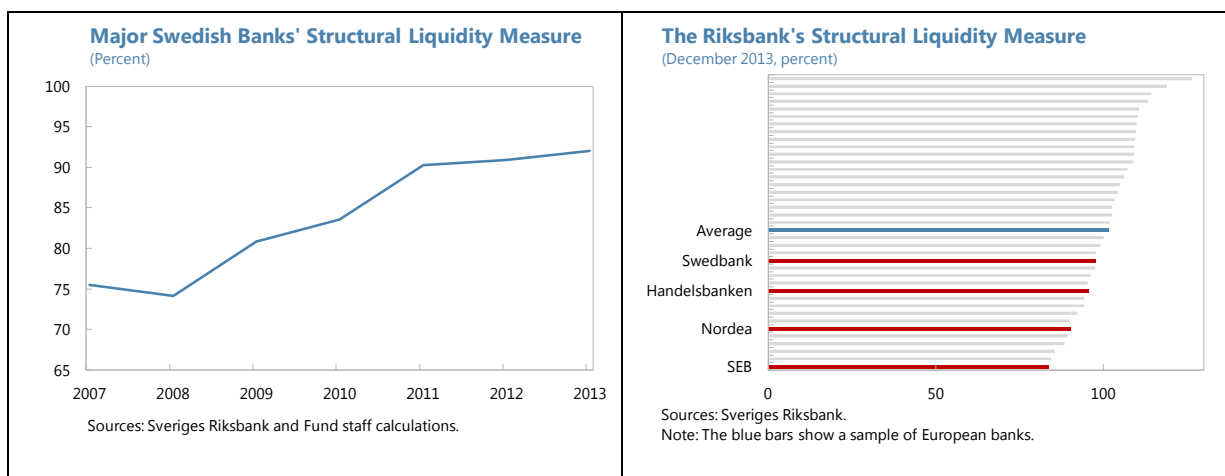
ratio would allow banks to preserve lending levels, in addition to increasing bank's shock-absorbing equity buffer more generally, which increases the resilience of the banking system as a whole.

11. Reflecting the size of their balance sheet, Swedish banks are highly dependent on wholesale funding. With a loan-to-deposit ratio of about 200 percent, around 50 percent of bank funding comes from wholesale sources. Bond loans and certificates provided roughly 20 percent and 16 percent of the outstanding wholesale funding in March 2014, respectively, out of which two-thirds of bonds and almost all of certificates are denominated in foreign currency.



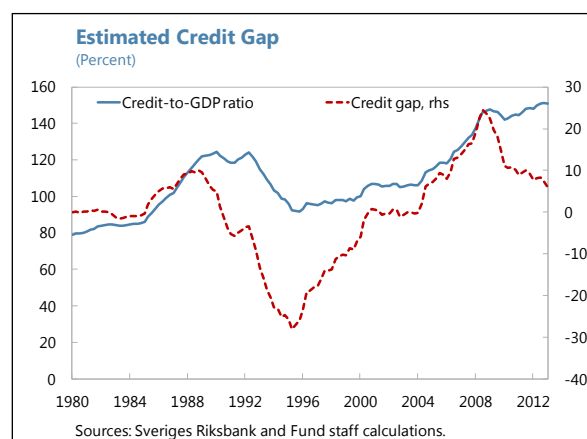
12. Structural liquidity has improved, but only gradually. Swedish banks already fulfill the liquidity coverage ratio requirement under Basel III. However, while lending largely consists of mortgages with long maturities, between 30 and 50 years, funding is predominantly through market instruments with an average maturity of four years.¹² This implies that fulfilling the NSFR requirement is more difficult, and correspondingly measures of structural liquidity point to the presence of risks in the system. Based on the Riksbank's measure of structural liquidity (which is conceptually akin to the NSFR prior to the revision in early 2014), the major Swedish banks improved their position in the aftermath of the global financial crisis—largely on the back of easy access to global funding markets. However, the speed of improvement has slowed in recent years and the levels are low compare to other European banks.

¹² This refers to the average maturity of Swedish covered bonds issued in the autumn of 2013, according to the Association of Swedish Covered Bond issuers. The average maturity for the stock of covered bonds was, at the same point in time, just below three years. Source: The Swedish mortgage market, Finansinspektionen, 2013.



13. On May 8, 2014, the FSA announced plans for additional supply side measures, including the introduction of the Basel III requirements. The FSA plans to introduce a counter-cyclical buffer and to implement, for the four largest banks, a 3 percent CET1 systemic risk buffers as well as a 2 percent CET1 buffer within the Pillar 2 framework. According to the FSA, assuming a counter-cyclical buffer of 1.5 percent, most banks already fulfill the CET1 requirement as of 2014:Q1. As a result, the FSA announcement had little market impact, and the four major banks' stock prices ended up higher at the end of the day. That said, if the counter-cyclical buffer was set at or close to 2½ percent, additional capital would be required. In addition, the FSA confirmed that risk weights for mortgages will be increased to 25 percent which market analysts expect could lead to a 20 basis points increase in mortgage rates.¹³

14. BIS methodology suggests the level of the countercyclical buffer should be set at or close to 2½ percent, the maximum value subject to international reciprocity. The buffer will be decided in the Fall 2014 after the FSA has consulted with the Riksbank, Ministry of Finance and the National Debt Office in the Financial Stability Council. Based on BIS methodology, credit growth in Sweden is much higher than its historical trend, indicating a positive credit gap above 6 percent of GDP at end 2013 (see text figure), with much of it driven by mortgage lending. Given recent upward trends in mortgage

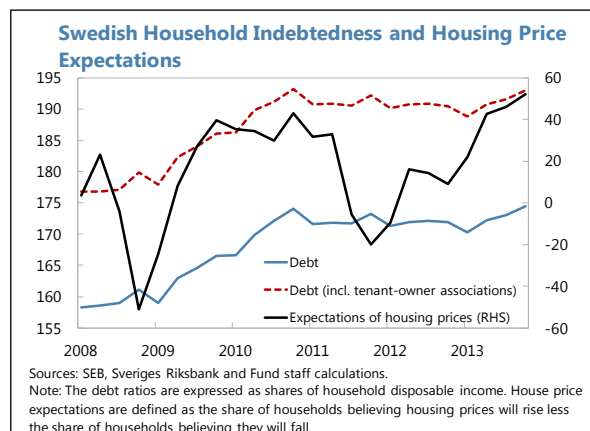


¹³ A simple model simulation implies an effect of similar magnitude (see below).

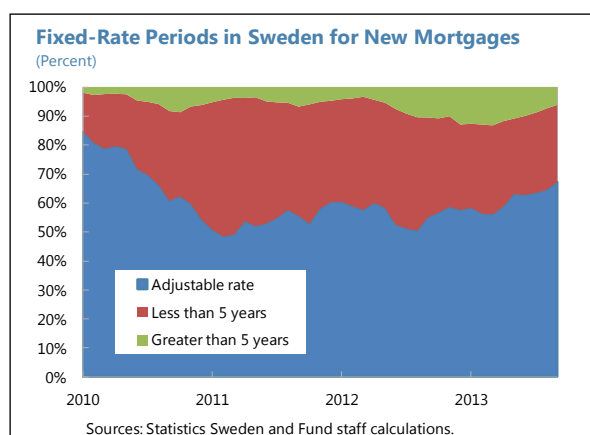
lending and house prices plus a persistent positive credit gap since 2005, these suggest a buffer at or close to the upper end of the maximum value subject to international reciprocity.¹⁴

Demand Side: The Factors Driving Swedish Household Debt

15. Swedish household debt is high and increasing. Household debt as share of disposable income approached 175 percent at end of 2013, and over 190 percent if debt from tenant-owned housing associations is included. The continued willingness of bank to lend notwithstanding, strong household demand fostered by low interest rates and expectations of further house price increases in the future is a key factor driving the continued growth of the household debt stock.

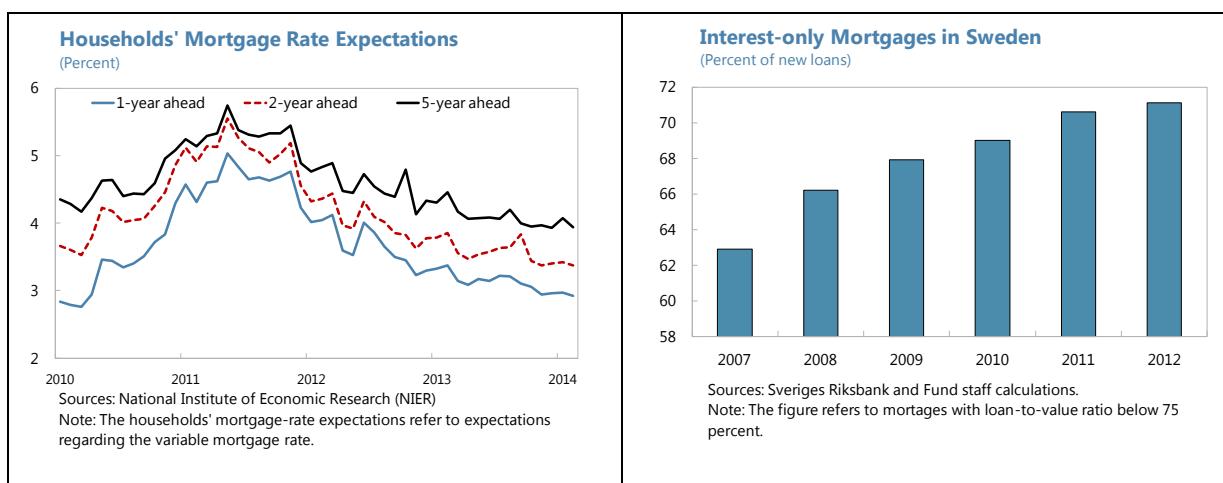


- Due to very low rates of property taxation and the income tax deductibility of mortgage interest rate payments, there are strong tax incentives to save in the form of housing rather than other assets. The link between property taxation and house prices is well established. For example, Crowe and others (2011), using US state-level data, show that a one standard deviation (\$5 per \$1000 of assessed value) increase in property tax rate is found to be associated with a 0.9 percentage point decline in average annual house price from an annual growth of around 5.6 percent per year. (See Appendix 2 for a summary of selected papers in the existing literature).
- After a long period of very low interest rates, households have taken on more debt with variable interest rates. Between 2012 and 2013, the share of variable interest rate mortgages has increased from around 55 to 67.2 percent and Swedish households expect mortgage rate to decline further.



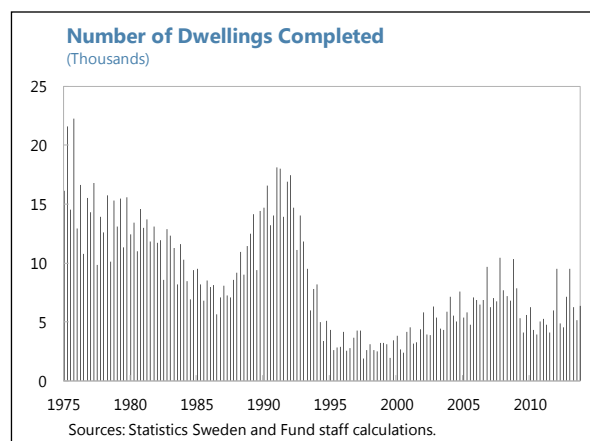
¹⁴ See <http://www.bis.org/publ/bcbs172.pdf> for the BIS recommendations.

- Related to these developments, mortgage amortization periods have declined. Between 2007 and 2012, the share of unamortized mortgage loans has increased from 63 to 71 percent of new mortgages issued.¹⁵ This runs contrary to trends elsewhere—for example, the share of unamortized mortgage loans has declined in the UK, where interest-only advances to residential mortgages fell from about 50 percent in 2007:Q3 to around 45 percent in 2008:Q3.



16. Rising household credit demand reflects rising house prices, in part resulting from very limited construction activity.

Housing construction decreased substantially after the crisis in the early 1990s and remained subdued since then. Several factors are constraining the supply, including the monopoly enjoyed by local municipalities over planning and zoning, a highly regulated rental market,¹⁶ lengthy permit processes, and strict zoning and environmental regulations. The limited expansion of housing supply contributed to rising house and apartment prices, especially in metropolitan areas such as Stockholm, and in turn continued to push up credit demand by households.



¹⁵ Focusing on households, which can hold multiple mortgages, rather than loans gives a broadly similar picture. Among the households with new mortgages and LTVs below 75 percent, about 60 percent did not amortize any of their mortgages in 2013.

¹⁶ In addition, rent controls could also have a distortionary impact on allocation of rental homes.

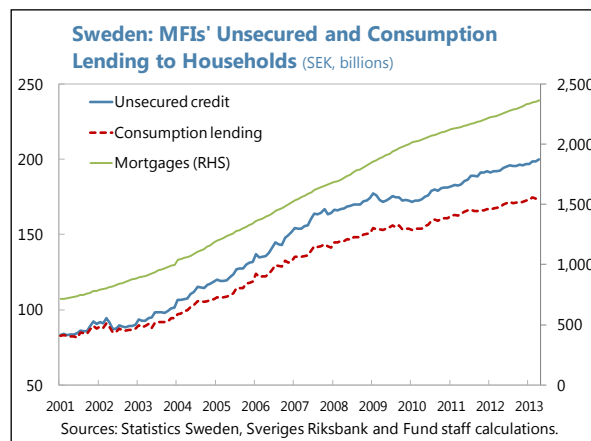
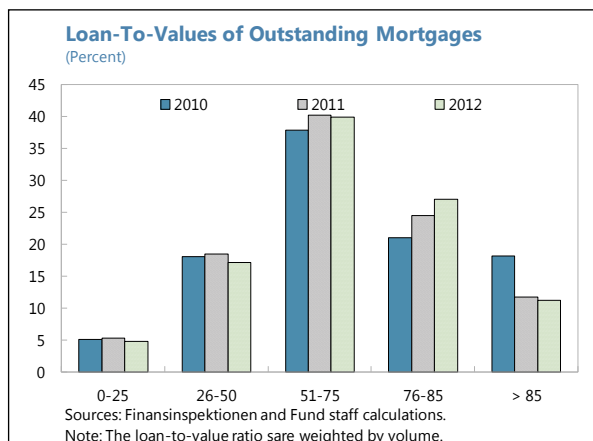
Table 3. Demand-Side Issues

Underlying Problem	Symptom	Remedy
High LTVs	High and rising household debt	Reduce LTV caps
Expectation of prolonged period of low interest rates	Long amortization period	Raise amortization requirements
Tax incentives	Large and increasing stock of variable interest rate loans	Reduce interest deductibility and increase property taxation

Source: Fund staff calculations.

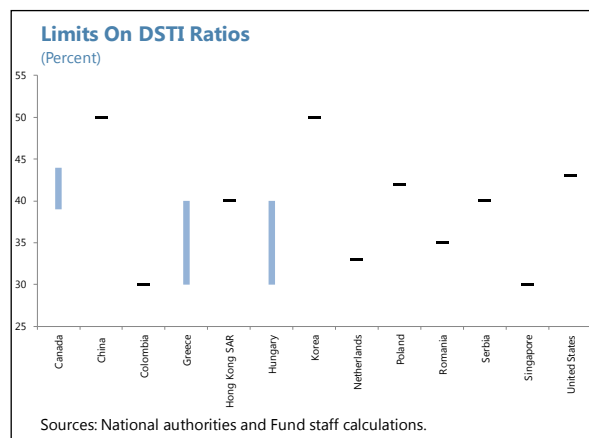
17. If progress under the current voluntary approach remains limited, a binding maximum amortization period for new mortgages would be helpful. Swedish banks are working to raise amortization through voluntary means. However, the picture remains largely unchanged. The share of new mortgages granted in 2013 that has an amortization plan has remained broadly constant from 2012. And, of the existing mortgage stock, a significant 40 percent of households either increased or did not decrease their debt in 2013. For the remaining 60 percent of households, it would take 100 years to fully pay down their debt if they continued to amortize at current speeds.

18. Lower LTV caps can contribute to address still high loan-to-value (LTV) ratios. The share of mortgages with LTV ratios exceeding 85 percent has significantly decreased after the introduction of the binding LTV cap in 2010, while the share of mortgages with a LTV ratio between 76 and 85 percent increased, indicating that there are strong incentives to keep the down payment to the minimum required by the LTV cap. The still relatively high LTV ratios, in turn, tend to lengthen amortization periods (as households seek to spread out higher mortgage payments), which leads to rising household debt. This suggests that lower, more binding LTV caps can play an important role in limiting debt accumulation. However, they do not necessary



contain debt in relation to incomes if house values are rising fast. Also, evidence suggests that Swedish households are turning to additional (unsecured) loans to comply with the LTV maximum requirement.

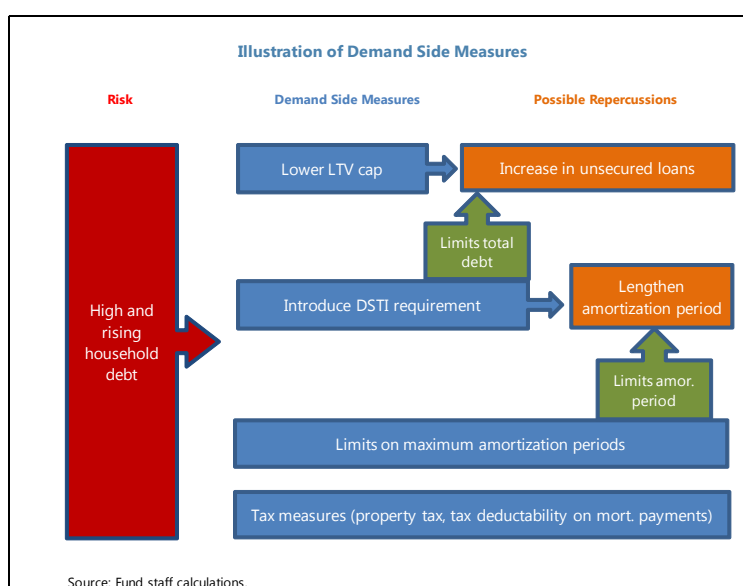
19. Debt service-to-income (DSTI) caps and binding amortization requirements are important complementary elements in the macroprudential toolkit. DSTI requirements tie households' debt levels to their income level, independent of house values, and can work as an automatic stabilizer that helps contain excessive increases in credit (and asset prices) relative to income. They can also increase households' resilience to income and interest rate shocks, complementing the LTV cap that affords resilience to asset price shocks.



In addition, DSTI limits can help address arbitrage of LTV limits through secondary loans. And minimum mortgage amortization requirements, in addition to moderating loan demand, would improve the effectiveness of DSTIs, by helping to avoid that binding DSTIs lead to lower amortization payments rather than a lower debt burden.

C. The Road Ahead: Which Tools Are Most Effective?

20. Empirical evidence suggests that demand-side measures are effective in curbing household borrowing. A survey of the growing literature on the effects of macroprudential policy instruments shows that LTV limits are particularly helpful in slowing credit growth (see Appendix 2). For example, Crowe and others (2011), using a panel of US state level data, find that a 10 percent tightening of the LTV ratio leads to a decline in the rate of house prices appreciation of between 8 and 13 percentage points. Similar results have been reported for other countries including by:



Ahuja and Nabar (2011) and Craig and Hua (2011) for HongKong; Igan and Kang (2011) for Korea, Jimenez and others (2012) for Spain, Krznar and Morsink (2014) for Canada and Elliot and others (2014) for the US housing market. In addition, other demand side measures, such as lower DSTI caps, limits on amortization periods and stamp duties have been found to be effective in

slowing mortgage credit growth. In contrast, the effectiveness of supply-side measures such as higher sectoral capital requirements is less clear.

Table 4. Incidence of Macprudential Policy Tightening

	Asia-Pacific	Central and Eastern Europe	Latin America	Middle East and Africa	North America	Western Europe	All Economies
Caps on LTV	41	8	1	0	4	12	66
Risk weights on mortgages	13	11	3	3	0	6	36

Sources: Shim, Bogdanova, Shek and Subelyte (2013) and Fund staff calculations.

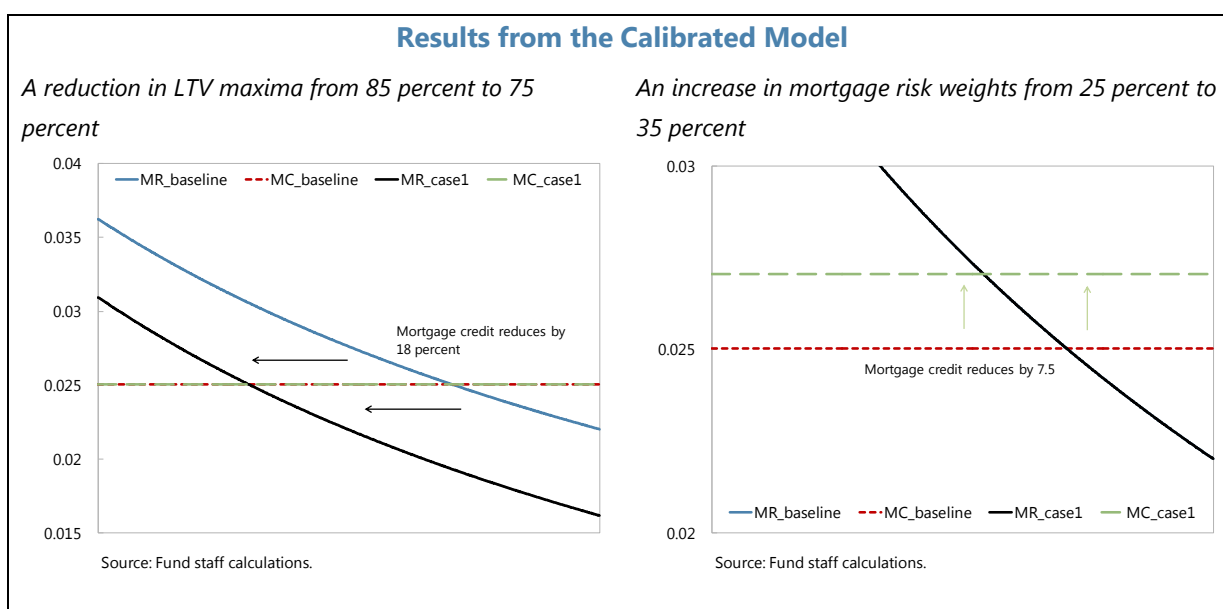
Note: The table shows number of (tightening) macro-prudential policy actions for 60 countries until June 2012.

21. There is less evidence on the simultaneous use of these tools—a scenario particularly relevant for Sweden. To shed some light on the interactions between mortgage supply (mortgage risk weights) and mortgage demand (amortization rate and LTV) side measures, consider a simple partial equilibrium model (see Appendix 1). In the model, a representative household decides between spending a fixed budget on consumption or housing over a certain period, the latter with the help of a mortgage credit drawn from a bank that draws funding from deposits and equity capital. Despite its highly stylized nature, the model suggests that a combination of demand and supply side measures is more effective in containing credit growth than supply side measures alone. In particular:

- *Mortgage risk weights, limits on maximum amortization periods and LTV ratios are each effective in reducing mortgage lending, but operate through different channels.* Higher risk weights on mortgages increase the bank's funding costs (the additional equity to fulfill capital requirements is more expensive than deposit-based funding), driving up lending costs. More binding LTV caps and shorter maximum amortization period, instead, directly affect household mortgage demand.
- *An efficient policy mix will combine both supply and demand measures.* The reason is that both types of measures are subject to diminishing returns, reflecting the (plausible) assumption that households value an additional unit of housing more when they have less of it.
- *When the level of both deposit rates and equity returns are low—along with overall mortgage rates—demand side measures tend to be more effective.* On the one hand, at lower mortgage rates, household can afford larger mortgage loans, which tends to make a given reduction in the LTV cap more effective in reducing loan demand. On the other hand, the impact of risk

weights is smaller as the spread between equity and deposit rates is low, making it less costly for the bank to switch from deposit to equity funding. A simple calibration of the model suggests that a 10 percentage points reduction in LTV maxima leads to a 18 percent decrease in mortgage credit, while a 10 percentage points increase in mortgage risk weights only reduces mortgage credit by 7.5 percent. (see Appendix 1 for the details of the calibration.)

22. The model also suggests that higher policy rates will impact both mortgage supply and demand.¹⁷ A higher policy rate reduces household wealth which, in turn, leads to lower mortgage demand. Simultaneously, a higher central bank rate will directly increase banks' funding costs and lower supply. That said, the model does not include alternative funding options such as covered bonds, which could dampen the impact on overall funding costs.



23. A simple structural VAR (SVAR) can shed light on the role of interest rates in the mortgage market. The VAR is estimated using monthly observations between September 2005 and March 2014 of inflation, industrial production growth, fixed-rate and variable-rate mortgage credit growth rates, the mortgage rate, the real effective exchange rate (REER), and the Stockholm Interbank Offered Rate (stibor).¹⁸ In addition, German bond yields and a time trend are included as exogenous variables in the system. Shocks are identified using sign restrictions in line with economic theory. Specifically, a positive monetary policy shock, as captured by changes in stibor, is assumed to have a negative impact on inflation, output, and variable-rate mortgage

¹⁷ Empirically, Crowe and other (2011) have also found policy rate is a powerful tool in reducing mortgage credits, despite other potential costs.

¹⁸ Variable rate credit accounted for over 60 percent of the stock of total mortgage credit in March 2014.

credit growth, but a positive impact on the fixed rate mortgage credit growth while the impact on the REER is left unconstrained.

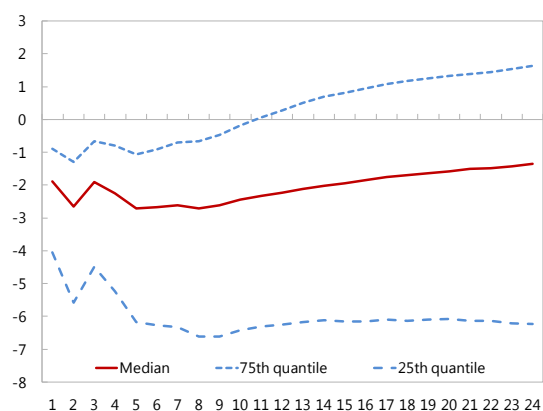
24. The results suggest monetary policy affects both the level and the composition of mortgage credit. The SVAR finds a negative relationship between the monetary policy rate and variable-rate mortgage credit growth but a positive relationship with fixed-rate mortgage credit growth, and these results remain significant for 12 months after the initial shock. In particular, an exogenous positive increase in stibor rate by 25 basis points leads to a peak-increase of 30 basis-points of the average mortgage interest rate and reduces variable-rate mortgage credit growth by 2.7 percentage points after two months. At the same time, it increases fixed-rate mortgage credit growth, as households shift to mortgage contracts which promise protection from further interest rate increases. Overall, the monetary policy shock decreases the total mortgage credit stock by 0.5 percent after two months, and household debt-to-income ratio by 0.5 percentage points.¹⁹ These results would suggest that a more restrictive monetary policy will not only reduce the household debt ratio but also reduce the vulnerability of households to interest rate shocks.

25. The main results are robust to a number of alternative specifications. The main findings are qualitatively unchanged across different sample periods and alternative sign restrictions—for example, with regard to the contemporaneous correlation between the monetary policy shock and output and inflation. Similarly, introducing additional control variables (e.g., cover bond rates or long term German bond yields) or varying lag lengths does not significantly alter results. That said, any such exercise comes with significant uncertainty—related to the simplicity of the model and the available sample size—and should be interpreted with caution.

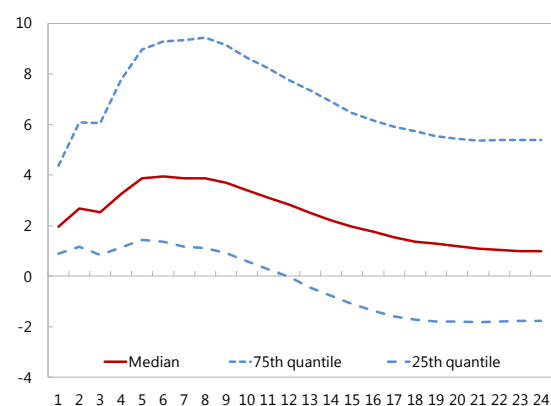
¹⁹ In calculating the impact of monetary policy on households' debt-to-disposable-income ratio, it is assumed that disposable income decreases by 0.5 percent following a 25 bp increase in the repo rate as estimated by Laseen and Strid (2013). In addition, it is assumed that a 25bp increase in the Stibor rate is equivalent to a 20bp increase in the repo rate estimated based on the historical relationship between the two rates. The impulse responses are then converted by taking the differences between the implied ratio and the assumed initial position (174.5 percent).

Impulse Responses to a Monetary Policy Shock

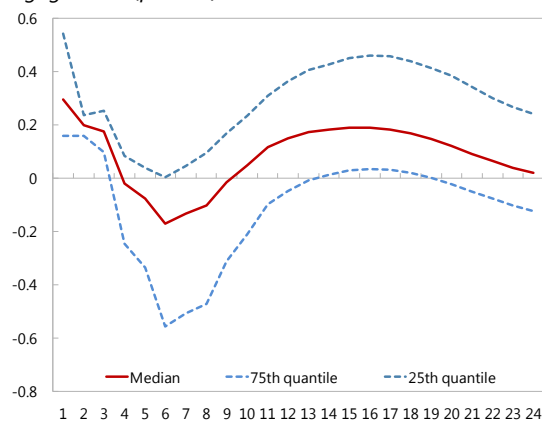
Variable-rate mortgage credit growth (percent)



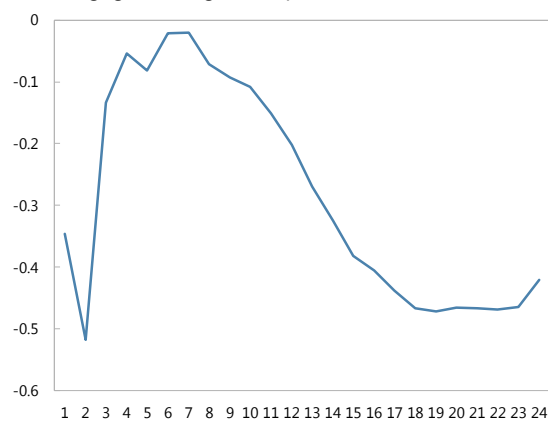
Fixed-rate mortgage credit growth (percent)



Mortgage rates (percent)



Total mortgage credit growth (percent)



Sources: Fund staff calculations.

Note: Impulse responses of variable-rate mortgage credit growth, fixed-rate mortgage credit growth and mortgage rates following a 25 basis point positive shock to the stibor rate, using a sign restriction identification scheme. Total mortgage credit growth is calculated taking the March 2014 stock of the variable and fixed rate mortgages as starting point, and applying the credit growth rates separately to the corresponding stock of mortgages.

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Appendix I. A Simple Model of Demand and Supply of Mortgages

In a simple model framework, we illustrate how mortgage supply measures (e.g., mortgage risk weights) and mortgage demand measures (e.g., LTV) interact. The main implication of the model is that both measures exhibit diminishing marginal returns in terms of their effectiveness, suggesting that an efficient policy mix will generally involve both supply and demand side measures. In addition, a calibrated version of the model shows that demand-side measures tend to be more effective when both the equity returns and deposit rates are low, implying that at the current juncture, particular emphasis should be placed on demand-side measures.

Set-Up

Household—Assume a representative household receives an income w each period, and chooses consumption c and housing stock H to maximize utility subject to a borrowing constraint. That is:

$$\max_{H,c} U(H, c) = \frac{H^{1-\gamma} - 1}{1-\gamma} + c$$

s.t.

$$\sum_{t=0}^n \left(\frac{1}{1+r_D} \right)^t (w - c) = \sum_{t=0}^n \left(\frac{1}{1+r_D} \right)^t r_m (1-\delta)H + \tau \delta H + \left(\frac{1}{1+r_D} \right)^{n+1} (1-\delta)H$$

The household must borrow to finance the house over the period n , with the financing consisting of two parts: (1) a mortgage loan $(1-\delta)H$ which the principal needs to be paid at the end of the loan contract, and (2) a lump sum down payment δH , where δ denotes the down payment (i.e. $LTV = 1-\delta$), i.e., the amount that must be paid immediately.¹ Banks providing the finance charge rate r_m for the mortgage and a fixed fee τ for providing the down payment.² The household borrows against his future discounted savings (income excludes consumption), which justifies the budget constraint above. For the LTV constraint to bind, we assume that $\tau > \frac{1}{1-\frac{r_m}{1+r_D}}$, which ensures that the household strictly prefers to borrow from the mortgage loan. In addition, we denote r_D as the per-period discount rate (or riskless rate) and r_m as the mortgage rate. Finally, to simplify the notation, we define $R = \frac{1}{1+r_D}$ and $\bar{R} = \frac{1-R}{1-R^{n+1}}$.

¹ Note, as $n \rightarrow \infty$, mortgage loan is converging to an unamortized loan.

² The down payment is assumed to be financed by a second loan.

Solving the household maximization problem, we obtain the demand for mortgages:

$$(1 - \delta)H = L^D = (1 - \delta) \left(r_m(1 - \delta) + \bar{R}\tau\delta + \bar{R}R^{n+1}(1 - \delta) \right)^{\frac{-1}{\gamma}}$$

Bank—We assume that a bank specializes in mortgage lending, financed by either equity or bank deposits. The bank maximizes its profit subject to a common equity tier 1 (CET1) capital requirement, that is:

$$\max_{r_m, k} (r_m - r_E k - r_D(1 - k))L_m$$

s.t.

$$\frac{kL_m}{\alpha L_m} = \bar{K}$$

where r_E denotes the return on equity, L_m the mortgage supply, k the share of equity in the bank's balance sheet, α the risk weight, and \bar{K} the CET1 capital requirement.

We assume the bank enjoys monopoly power so that it takes the downward sloping demand curve as given from the household, and sets the mortgage rate (price) such that marginal cost equals marginal revenue.

Analytically—One can easily solve the model and show that the LTV, limits on amortization period and mortgage risk weights are effective in reducing mortgage credit growth. In particular:

$$\frac{\partial L}{\partial \alpha} = (1 - \delta) \left[(1 + \tau\delta)(1 - R)(1 + \gamma) \right]^{-\frac{1}{\gamma}} \left[1 - R(r_D + \alpha \bar{K}(r_E - r_D)) \right]^{\frac{1}{\gamma}-1} (-R\bar{K}(r_E - r_D)) < 0$$

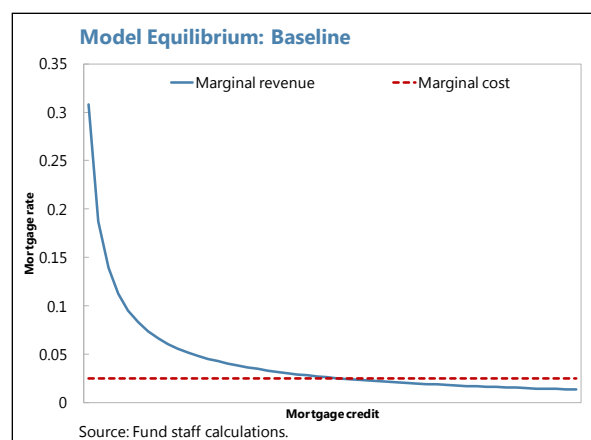
Moreover, it can be shown that $\frac{\partial L}{\partial \delta} < 0$, $\frac{\partial L}{\partial n} < 0$, $\frac{\partial^2 L}{\partial \alpha^2} > 0$ and $\frac{\partial^2 L}{\partial \delta^2} > 0$.

Calibration—The table below shows the model's baseline calibration. Specifically, we choose the equity returns to match the observed return on equity in 2013, and the deposit rate is set at 2 percent, roughly the return on fixed maturity (less than two years) deposits in 2013. Moreover, we calibrate the CET1 capital requirement to be 15.5 percent consistent with the Riksbank's recommendation, LTV maxima are set at 85 percent according to the FSA requirement, mortgage risk weights are set at 15 percent and average amortization period to be 100 years as indicated in the recent Riksbank mortgage report. Owing to the simplicity of the model, household preference parameter γ and the service cost of down payment τ are chosen to some reasonable values, but without matching particular empirical moments. However, the key results of the model do not change qualitatively by varying these two variables.

Table A1. An Illustrative Calibration			
	Variable	Parameter	Value
Calibration	Deposit rate	r_m	0.02
	Equity returns	r_E	0.15
	Household preference	γ	0.7
	Service cost of downpayment	τ	2
	CET1 requirement	\bar{K}	0.155
	LTV maxima	$1 - \delta$	0.85
	Mortgage risk weights	α	0.15
Model implied	Mortgage rate	r_m	0.025
Source: Fund staff calculations.			

Baseline result—The mortgage rate in the model is pinned down by the bank’s marginal cost, and the equilibrium mortgage credit volume is determined by the intersection between the marginal revenue and the marginal cost curves (see text figure). In what follows, we use variants of this figure to study the interaction between mortgage risk weights and LTV maxima.

Result 1—An efficient policy mix consists of both supply and demand side measures. As illustrated by the text figures below, both measures are subject to diminishing returns. For example, 5 percentage point reduction in LTV maxima starting from 85 percent leads to a larger decline in mortgage credit than when it takes place at the 80 percent level. Similarly, a 5 percentage point increase in mortgage risk weights reduces mortgage credit more when it takes place at a lower starting level of risk weights. These results follow from households’ concave preferences over housing (reflected in the convex marginal revenue curve above), that is, they value housing more when they have less of it.



Result 2—When the level of both deposit rates and equity returns are low—along with overall mortgage rates—demand side measures tend to be more effective. Figure A1 illustrates two cases with low deposit rates supporting this claim. Households tend to demand larger loans when deposit rates, hence the mortgage rates, are low as illustrated in the top panel. This makes the demand side measures particularly powerful, as 1 percentage point reduction in LTV maxima leads to a decline in mortgage credit that is proportional to the house price. The effectiveness of credit risk weights hinges on the spread between equity and deposit returns, which, in turn, relates to the level of equity and deposit rates. When both are at low levels, it becomes less costly for the banks to switch from deposit to equity funding. At the same time we

observe that the effectiveness of risk weights is also a decreasing function of the deposit rate because when the deposit rate is high, it costs less for bank to switch to equity funding (assuming that equity returns are constant). However, this diminishing effect is much smaller (relative to a same unit reduction in LTV maxima), because the deposit and equity returns, hence the spread, are at very low levels.

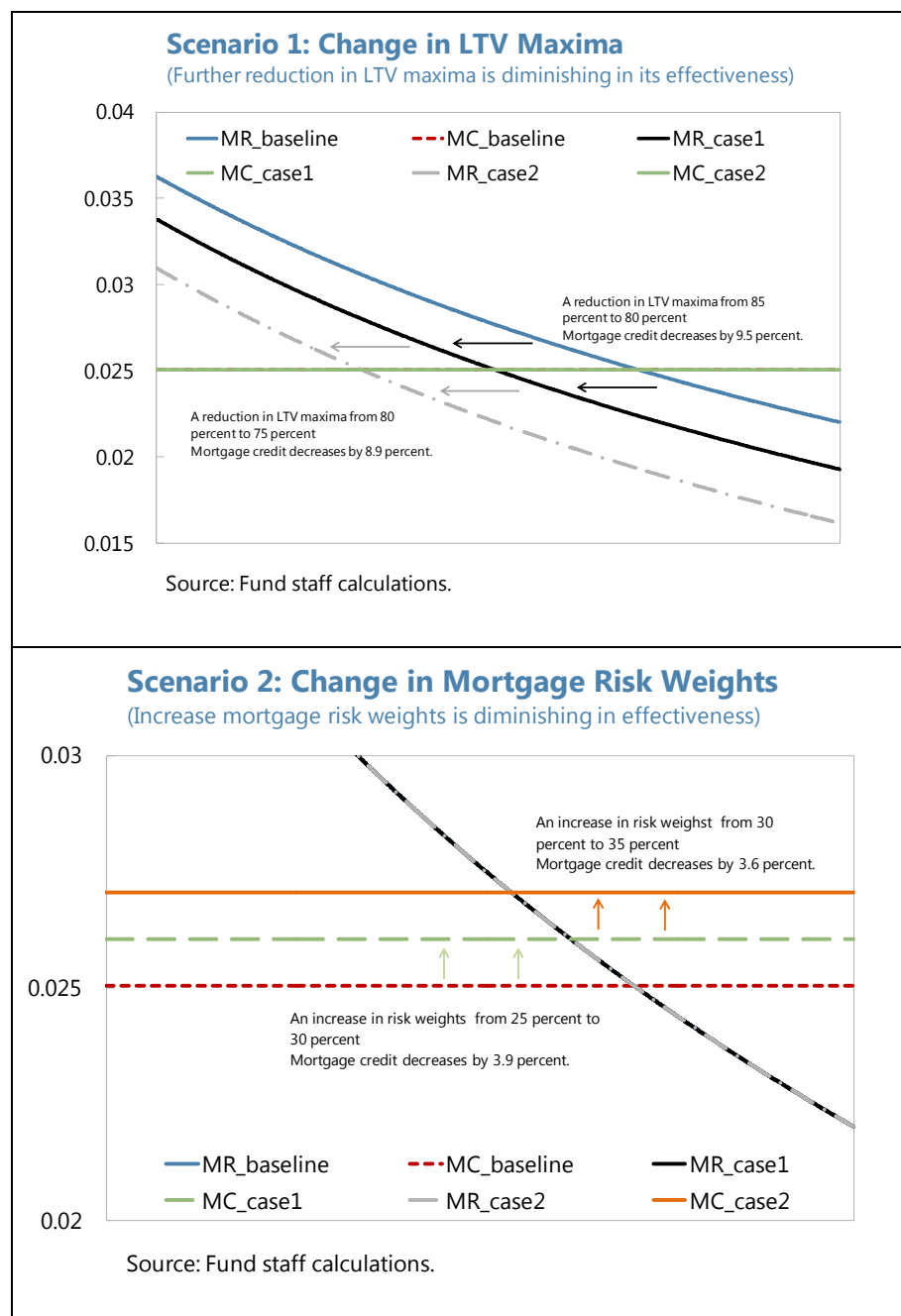
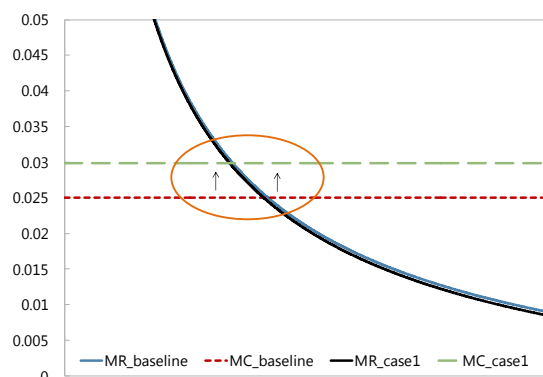
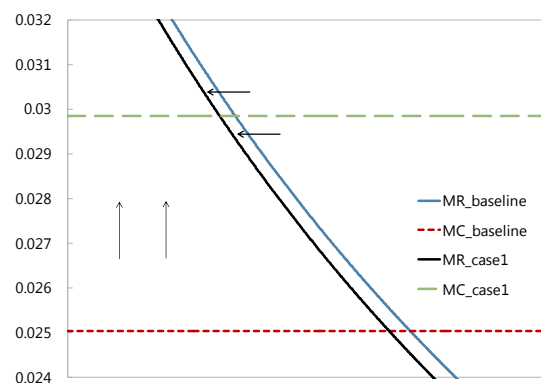
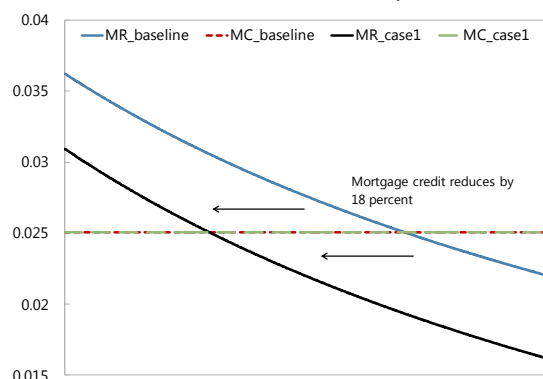


Figure A1. Effectiveness of Demand and Supply-Side Measures*Baseline: $r = 2$ percent; Case 1: $r = 2.5$ percent*

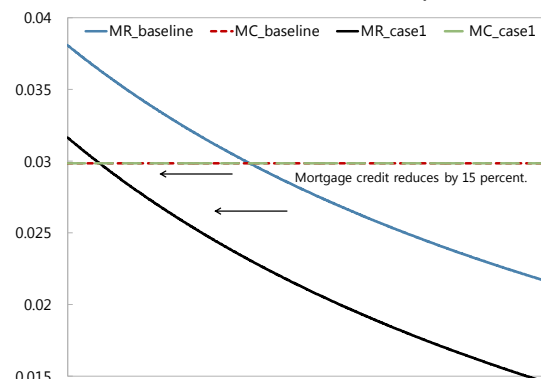
Source: Fund staff calculations.

Zoom in around orange circle

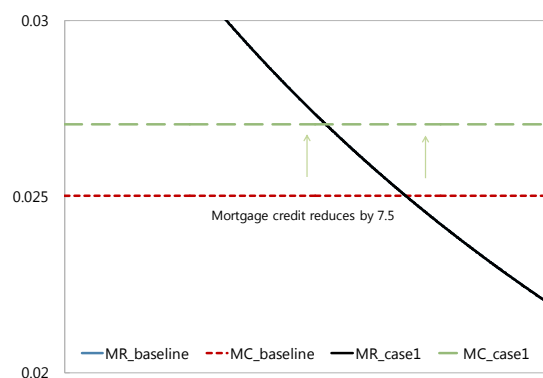
Source: Fund staff calculations.

*At $r = 2$ percent: Baseline LTV = 85 percent;
Case 1 LTV = 75 percent*

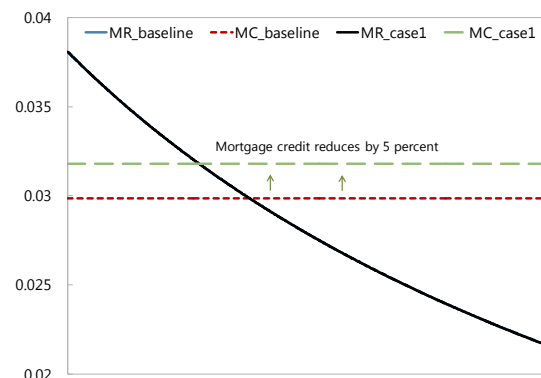
Source: Fund staff calculations.

*At $r = 2.5$ percent: Baseline LTV = 85 percent;
Case 1 LTV = 75 percent*

Source: Fund staff calculations.

*At $r = 2$ percent: Baseline risk weight = 25 percent;**Case 1 risk weight = 35 percent*

Source: Fund staff calculations.

*At $r = 2.5$ percent: Baseline risk weight = 25 percent;**Case 1 risk weight = 35 percent*

Source: Fund staff calculations.

Appendix II. Selected Literature Survey

Reference	Instruments	Methodology	Key findings
<i>Cross-country analysis</i>			
Arregui and others (2013)	LTV, DSTI, risk weights, reserve requirement, provisioning requirement	Dynamic panel regression on 38 countries based on Krznar and others (2013) data (2000-2011)	LTV, DSTI, risk weights, reserve requirement effective in containing credit (to GDP) and house price growth
Ahuja and Nabar (2011)	LTV, DSTI, risk weights, reserve requirement, provisioning requirement	Dynamic panel regression on the 2010 IMF survey data (2000-2010)	LTV caps tend to have a decelerating effect on property price growth. LTV and DSTI slow property lending growth
Almeida and others (2005)	LTV, DSTI, risk weights, reserve requirement, provisioning requirement	Panel regression of house price growth and mortgage credit growth on a sample of 26 countries over the 1970-1999 period	New mortgage borrowings and house prices are more sensitive to aggregate income shocks in countries with higher LTVs.
Dell'Ariccia and others (2012)	Differential treatment of deposit accounts, reserve requirements, liquidity requirements, interest rate, credit controls, open FX positions	Panel regression with a composition measure of the size instruments	Reduce the incidence of credit homes and decrease the probability that boom end up badly
IMF (2012), Board paper on interaction between monetary and macroprudential policy	LTV, DSTI, risk weights, reserve requirement, provisioning requirement	Dynamic panel regression on 38 countries based on Krznar and others (2013) data	LTV, DSTI, risk weights, reserve requirement effective in containing credit (to GDP) and house price growth
Kuttner and Shim (2012)	LTV, DSTI, risk weights on mortgages	Panel regressions of housing price growth and housing credit growth on a sample of 57 countries (1980-2010)	LTV and DSTI effective in curbing mortgage credit and house price growth
Lim and others (2011)	LTV, DSTI, ceiling on credit growth, reserve requirement, capital requirement, provisioning requirement	Dynamic panel regression on the 2010 IMF Survey data (2000-2010)	Reduce procyclicality of credit growth
Tovar and others (2012)	Reserve requirement, dynamic provisioning, capital requirement	Dynamic panel data VAR on 5 L.A. countries during 2003-11; macroprudential measures are captured by a cumulative dummy	Average reserve requirements and composite of other types of macroprudential policies had a moderate and transitory effect on credit growth
Vandenbussche and others (2012)	Summarized major measures into 29 categories	ECM on 16 Central Eastern and Southeastern Europe from the late 1990s or early 2000s to end 2010	Changes in minimum capital requirement has impact on house price inflation
Wong and others (2011)	LTV	Panel regression data from 13 countries	Reduce the sensitivity of mortgage default risk to property price shocks. Tightening LTV caps in general would reduce household leverage

LOW INFLATION IN SWEDEN—WHAT'S DRIVING IT?¹

Inflation has been persistently below the Riksbank's 2 percent target since 2010 and on a declining trend despite the improving outlook. Disinflationary pressures stem both from "imported inflation" and slower inflation in the service sector. Until recently, the strong krona contributed to disinflation by reducing the domestic currency price of imported goods. This was reinforced by falling inflation in Sweden's major trade partners, especially the euro area. Lower energy prices, both electricity and fuel, have also played a role. This includes both the direct effects of energy prices in the CPI basket and the indirect effects of falling fuel prices on inflation in the transportation industry, which is also an input in many other sectors. Against this background, several indicators of inflation expectations have been trending down and are currently below target.

A. Decomposing Inflation

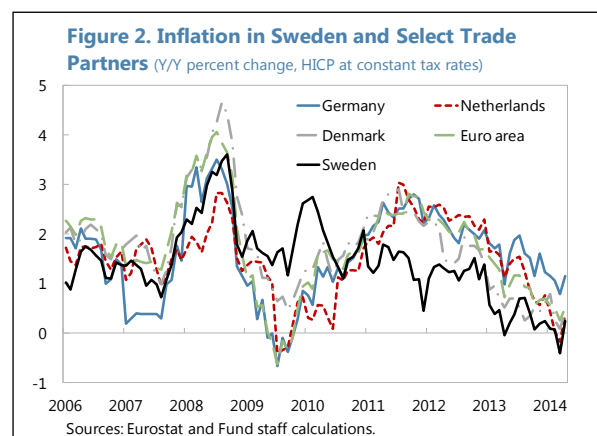
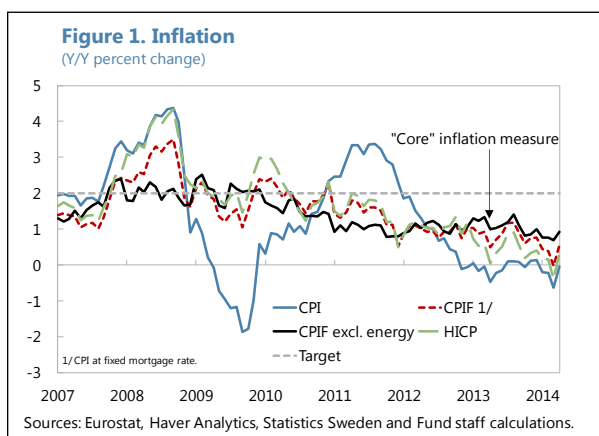
1. The pace of inflation in Sweden has been slowing over the past few years. Headline Swedish inflation—as measured using the Harmonized Index of Consumer Prices (HICP)—fell sharply during the financial crisis, from over 4 percent in September 2008 to a nadir of 1.5 percent a year later, before rebounding sharply—to nearly 3 percent by end-2009.² Since early 2010, however, Sweden's inflation rate has been on a downward trend. The latest estimates of headline inflation for March 2014 indicate that Sweden has, at least temporarily, slipped into deflation. However, "core" inflation (CPIF excluding energy), though low, remains positive (Figure 1).

2. The disinflationary trend is hardly unique to Sweden though, as most of its major trade partners are experiencing a similar slowdown in inflation.³ While Sweden's underlying inflation rate began to trend down before that of most of its major trading partners, since mid-2011 inflation in most of those countries, especially those in the euro area, has fallen substantially (Figure 2). However, headline inflation in Sweden is still lower than it is in most of its major trading partners.

¹ Prepared by Nathaniel Arnold.

² HICP inflation is defined comparably across EU countries. Inflation for the CPI with a fixed mortgage rate (CPIF), a Sweden specific inflation measure, behaved similarly, falling from 3.50 percent to just over 1 percent in the year after Lehman Brothers collapsed (see Box 1 for details on different inflation measures in Sweden). Throughout the paper, when referring to inflation generally, we mean the HICP or CPIF measures of inflation, which behave similarly.

³ Nearly half of Sweden's imports come from the euro area, and, accounting for one-third of imports, the individual countries shown in the text figure are three of Sweden's top five sources of imports. The other two are the U.K., where inflation is higher, but slowing, and Norway, which is not shown as Eurostat does not provide comparable data for HICP at constant tax rates for Norway.



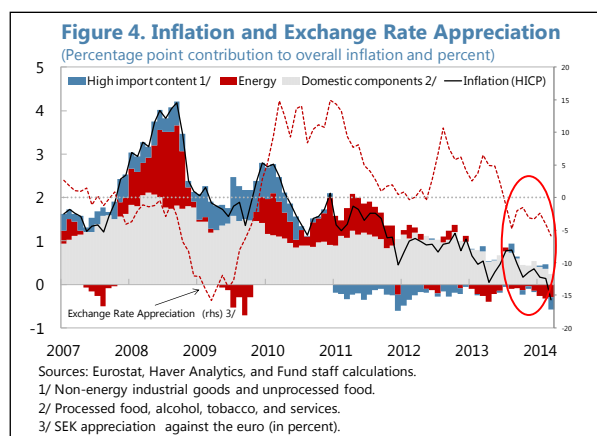
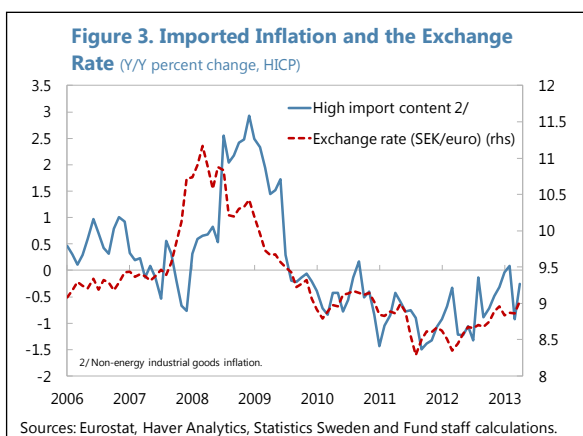
Box 1. Swedish Measures of Inflation

Sweden's headline Consumer Price Index (CPI) inflation is relatively volatile compared to the Harmonized Index of Consumer Prices (HICP) measure of inflation, which is comparable across EU countries. This volatility stems from the fact that the CPI includes mortgage interest costs in the price index. Since most mortgages have variable interest rates, monetary policy rate changes have a large impact on inflation measured using CPI. Hence, the Swedish authorities have also developed a measure of CPI with a fixed mortgage interest rate (CPIF). The authorities also publish another measure (CPIX) that is similar to CPIF, but also excludes the impact of tax and subsidy changes. Finally, measures of "core" inflation based on the CPIF excluding energy and/or food, are also available (see Figure 1).

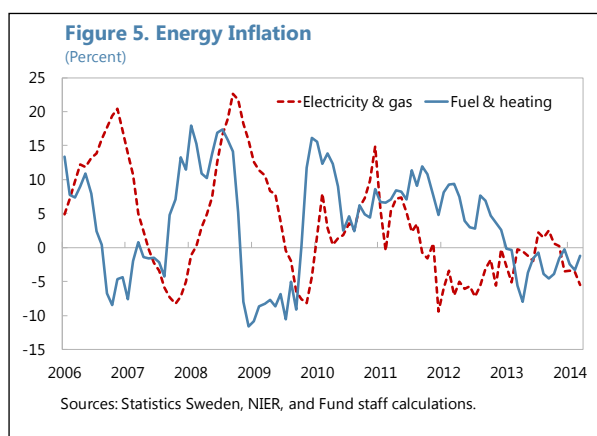
3. This suggests that Sweden imported low inflation, helped by a strong krona.

- The most important factor was the *rapid appreciation of the Swedish krona* from end-2009 through 2011Q2, as the euro area crisis began to unfold and Sweden was viewed as a relative "safe haven" by investors.⁴ Appreciation pressures began to ebb in mid-2011. However, by mid-2012 renewed uncertainty brought "flight to safety" dynamics back and the krona appreciated again until mid-2013. This allowed foreign exporters to cut their prices in krona, lowering inflation directly by bringing down the cost of imported goods and indirectly by pressuring Swedish firms competing with those imports to restrain or cut their prices.
- The second factor that contributed to imported disinflation was *slower inflation in major trade partners*, especially in the euro area. If foreign exporters are cutting their prices, or raising them more slowly, this may increase the competitiveness of their goods in Sweden. Figure 3 shows that the decline in the rate of inflation for "high import content" items (e.g., industrial goods) largely mirrors the strengthening of the krona relative to the euro (though with a lag). However, Figure 4 suggests that the disinflationary pressures from imports continued even once the krona started to depreciate in mid-2013.

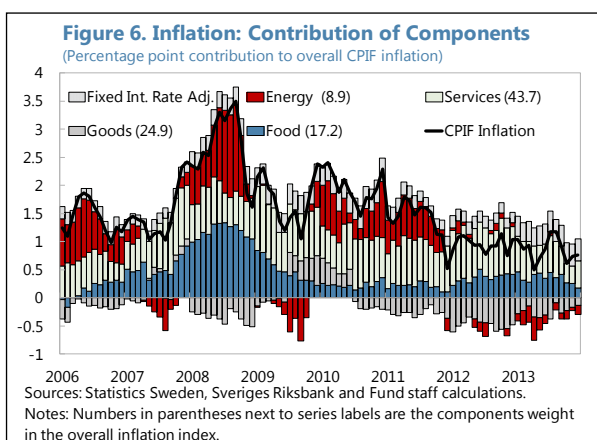
⁴ See *Sweden Staff Report on the 2013 Article IV Consultation*.



4. Energy price developments have also contributed to lower inflation in recent years. The contribution of energy price inflation has systematically declined since 2011. Energy price inflation turned negative in 2013, on average reducing the annual HICP inflation rate by 0.2 percentage points (Figure 4). Notably, electricity and gas price inflation has been negative since late-2011, while fuel and heating price inflation slowed in 2012, but only became negative in 2013 (Figure 5).



5. Lower inflation in the domestic components of the price index, while not negative, is adding to disinflationary pressures. The domestic components of overall inflation were relatively stable until late-2012, but have been declining since then (Figure 4). This is confirmed when looking at a slightly different decomposition for CPIF inflation (Figure 6). Besides the negative inflation contribution by goods and energy discussed above, we see that the contributions from food and services have been declining.



6. A variance decomposition confirms the importance of energy and services prices for overall inflation. While energy prices account for half of the variation in inflation during 2006–13, services account for a larger than usual share of the variance in 2013. For the entire 2006–13 period, the variance of services inflation accounts for roughly 7 percent of the variance

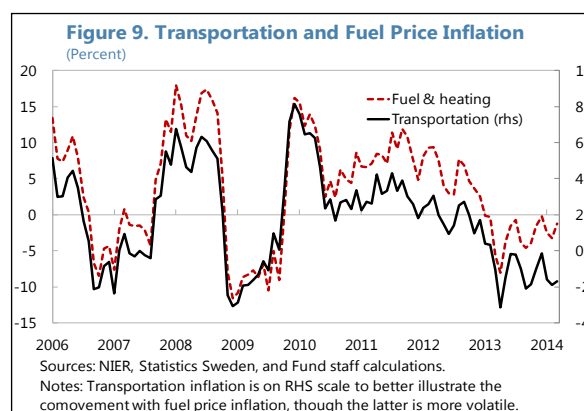
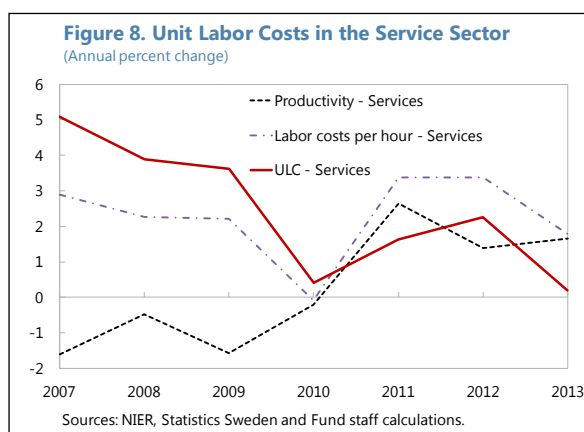
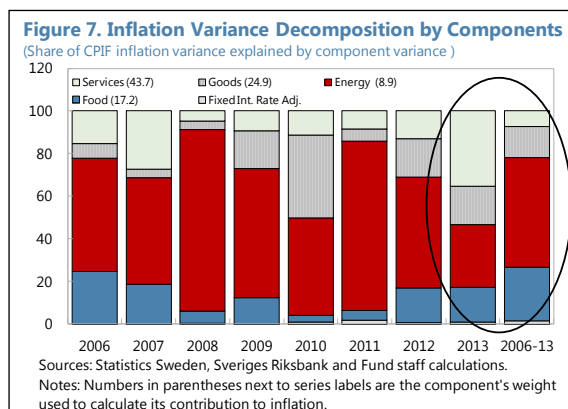
in overall inflation (Figure 7). However, looking just at 2013, we see that the share of the inflation variance accounted for by services rises to 36 percent, while energy accounts for only 30 percent.

7. In part, the slowdown in services inflation can be explained by higher productivity growth. On average, labor costs in the services sector grew at 2.8 percent annually since 2011, slightly higher than the 2.6 percent average growth during 2007–08. However, service sector productivity has also picked up notably since 2011, helping to lower overall unit labor costs (ULC) growth in 2013 to just 0.2 percent, significantly less than the 1.2 percent growth in ULC for the whole economy (Figure 8). This came despite relatively strong employment growth in the services sector of around 2.1 percent, double the employment growth rate of 1 percent for the overall economy in 2013.

8. Lower energy prices also contributed indirectly to slowing service sector inflation, with the most pronounced change in the transportation industry. Indeed, price developments in the transportation industry appear to be tightly linked to changes in fuel price inflation, with a correlation of 0.95 between fuel and transportation inflation rates (Figure 9). Given that transportation services are an important intermediate input in other sectors of the economy, such second round effects of the decline in energy prices seem to be relevant for the overall development of headline inflation in Sweden.

B. The Role of Inflation Expectations

9. Inflation expectations could also play a role in explaining the decline in inflation. In standard macroeconomic models with inflation, such as the workhorse New Keynesian model with sticky prices (e.g., due to costly price adjustment), firms set prices in line with costs (i.e.



wages, capital, intermediate goods) and the expected increase in costs and prices set by others. This suggests that changes in inflation expectations could matter for inflation dynamics. For example, in models where firms and households learn adaptively about the economy over time, persistently low inflation could cause inflation expectations to gradually converge to very low levels as well, which, in turn, will impact actual inflation. This can make it more difficult for a central bank to achieve its inflation target.⁵

10. In practice, measuring inflation expectations is difficult. One approach to measuring inflation expectations is to survey households, firms, and others, such as money market participants (or economists), asking them what they expect the inflation rate to be over different time horizons and taking the average of the responses. Another approach is to derive implicit “market-based” inflation expectations from inflation indexed bonds at different maturities. Each approach has its weaknesses though. For instance, survey results for expectations, especially over shorter horizons, may be overly informed by recently observed inflation. Factors such as the liquidity of inflation indexed bonds or increased risk aversion in financial markets can impact the volatility and accuracy of inflation expectations derived from such bonds. Hence, when trying to measure inflation expectations, it is best to look at several different indicators, including both survey and market-based approaches.

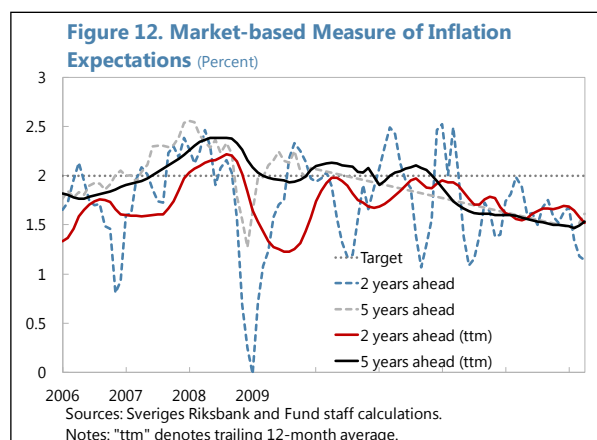
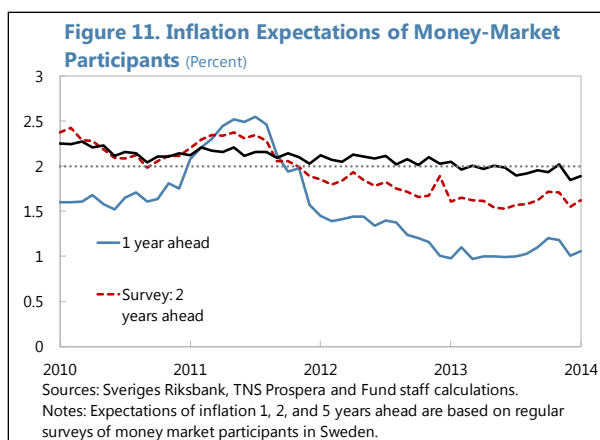
11. Across most indicators, inflation expectations have been declining in Sweden.

Surveys that cover households and firms only ask about expected inflation 1-year ahead, which, as noted above, can be excessively sensitive to recent inflation observations. Thus, as observed inflation has fallen, perhaps it is unsurprising that expectations of inflation 1-year ahead have fallen below target (Figure 10). However, this trend is also reflected in both survey and market-based measures of inflations expectations over longer horizons (Figures 11 and 12). Both measures of expected inflation 2-years ahead have been trending down since 2011 and are currently around 1.5 percent, as is the market based measure of expected inflation 5-years ahead.⁶ The only measure of expected inflation that remains close to the 2 percent target is money market participants’ expected inflation 5-years ahead (Figure 11).



⁵ Technically, in adaptive learning models, if inflation falls below a certain threshold, this can cause inflation expectations to continue falling, generating a deflationary spiral and economic stagnation (see, for example, Evans and Honkapohja, 2001). However, this more extreme outcome in the model is unlikely to be relevant for Sweden, where growth is currently accelerating.

⁶ As implicit market-based measures of expected inflation can be volatile, the trailing 12-month average better illustrates the trend, which is consistent with the survey results for money market participants (Figure 12).

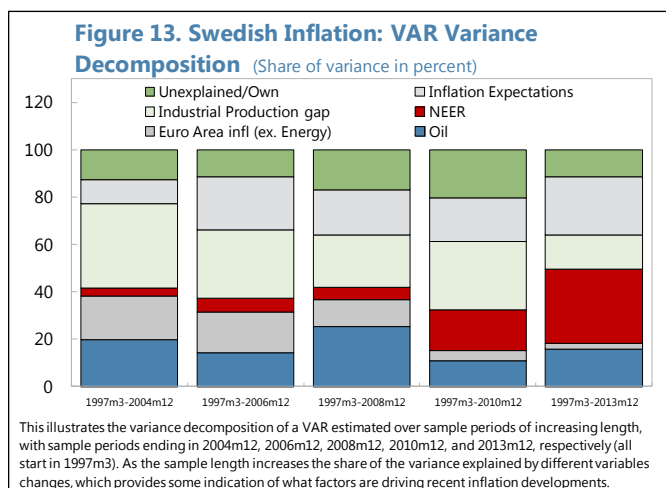


C. An Analysis of the Drivers of Inflation

12. To better understand the determinants of Swedish inflation, we estimate a VAR using monthly data covering 1997:M3 to 2013:M12. Variables of interest include oil price growth, euro area inflation (excluding energy), the gap between industrial production (IP) index and its trend, survey-based inflation expectations two years ahead, the change in the nominal effective exchange rate (NEER), and Swedish inflation (all changes are annual percent). The VAR is estimated over increasing sample lengths, with a variance decomposition performed for each sample period, to illustrate the changes over time in the factors contributing to inflation.

13. The determinants of Swedish inflation have changed over time.

Based on the full sample (far right bar in Figure 13), the variance decomposition indicates that external factors (oil, euro area inflation and the NEER) have accounted for about $\frac{1}{2}$ of the total variance, and more than $\frac{1}{2}$ of the explained variance (total minus unexplained/own). In part, this reflects changes in commodity prices and the appreciation of the krona in recent years. While the overall importance of domestic factors combined (IP gap and inflation expectations) declines over time, inflation expectations have accounted for a larger share of the explained variance (nearly 30 percent) over the full sample period compared to earlier sub-periods.



14. The VAR results are largely consistent with the analysis of the changing contribution of different inflation components and the role of inflation expectations. As discussed above, much of the recent disinflationary pressure appears to be imported, particularly due to declining oil prices, including though the impact on transportation services inflation, and

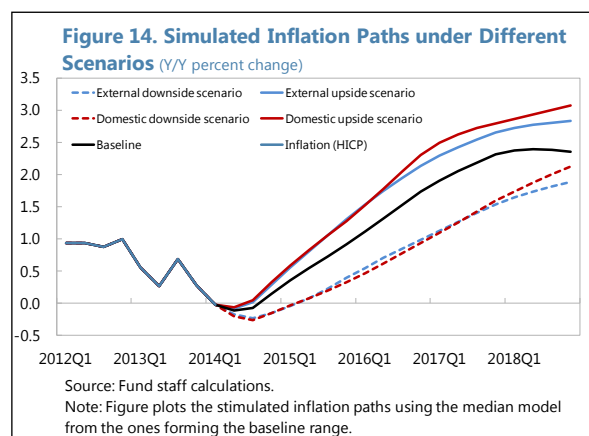
the appreciation of the krona. Additionally, the VAR variance decomposition seems to support the notion that declining inflation expectations may be contributing to lower actual inflation. It should be noted though, that the measure of inflation expectations used is strongly correlated with actual inflation, which makes it difficult to distinguish shocks to expectations from shocks to inflation itself. Finally, though the variance accounted for by the IP gap is lower in the full sample than in earlier sub-periods, it is still relevant. This suggests that, as growth accelerates and the output gap closes, inflation is likely to rise as well. Furthermore, if the recent rise in oil prices persists, it should raise inflation both directly and indirectly through transportation prices.

15. A simple Philips curve approach can help illustrate how external and domestic factors shape inflation dynamics going forward.

An estimated Philips curve model suggests that inflation converges to the medium-term target of 2 percent around the end of 2016, as the output gap closes and the euro area recovery drives up imported inflation (see Box 2 in the Staff Report for details).

However, both domestic and external shocks can alter the speed at which the inflation target is reached. In a downside scenario with a slower

than expected euro area recovery, for example, the projected pick-up in inflation would be delayed until mid-2018. In an upside scenario, with higher oil prices, for example, the 2-percent level would be reached already in early 2016 (see Figure 14 and Box 2 in the Staff Report).

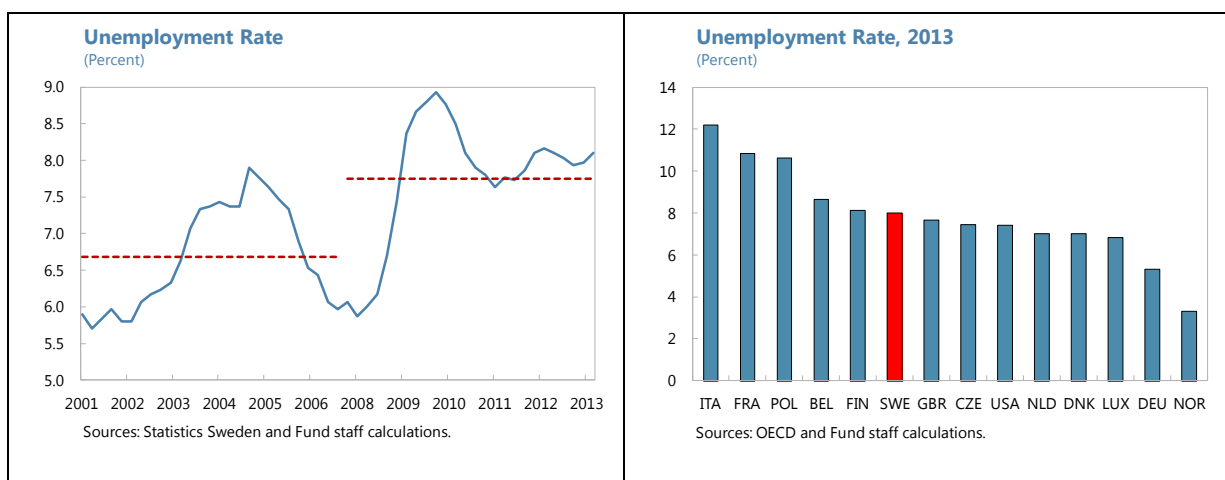


THE SWEDISH LABOR MARKET—RESPONDING TO GLOBAL CHALLENGES¹

Over the past decades, Sweden has undertaken a broad range of structural reforms, including in the labor market. Yet, unemployment has remained stubbornly high and increasingly concentrated among the young and low-skilled. High unemployment despite a strong growth outlook suggests that structural factors play a role. Tackling these factors requires strengthening Sweden's unique labor market model, including through lower employment protection, more focused active labor market policies, and greater firm-level wage flexibility. In addition, removing housing market inefficiencies and reforming the educational system would address increasing signs of labor market mismatch in a number of areas.

A. Structural Change in the Labor Market

1. Swedish unemployment is high despite otherwise strong economic dynamics. Since the onset of the crisis, unemployment averaged 7.7 percent, up from an average of about 6.7 percent during 2001–07 and a long-time low of about 5½ percent in 2000. At currently over 8 percent, the Swedish unemployment rate exceeds that of most other advanced European economies, despite having had the largest cumulative growth since 2009 among EU members. And strong economic growth, along with robust growth in credit, housing prices and employment, indicates a quickly closing output gap, projected to turn positive by end-2014.²

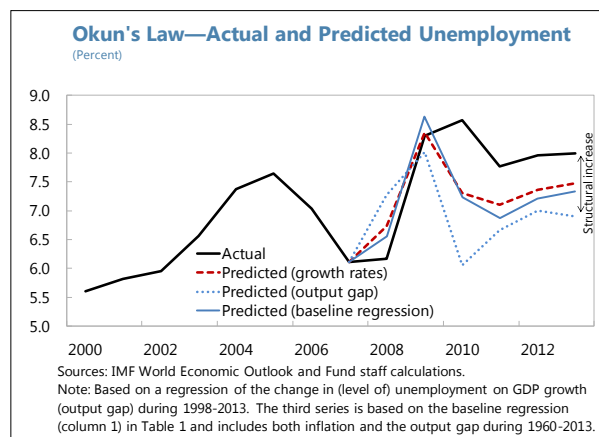


¹ Prepared by Martin Schindler.

² See the Selected Issues chapter on "[Potential Output and Unemployment](#)" for the 2013 Article IV for a discussion.

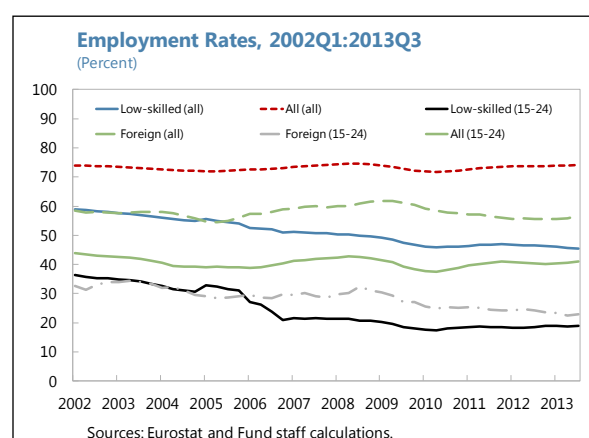
2. Unemployment is largely structural.

Okun's Law—the empirical correlation between cyclical unemployment fluctuations and economic conditions—would have predicted a decline in unemployment to between 6.9–7½ percent in 2013, depending on whether output gap or growth dynamics are used. These calculations suggest that since 2007 the structural component of unemployment has increased by about ½–1 percentage points compared to pre-crisis levels. Alternative approaches indicate that structural increases could be even larger (Box 1).



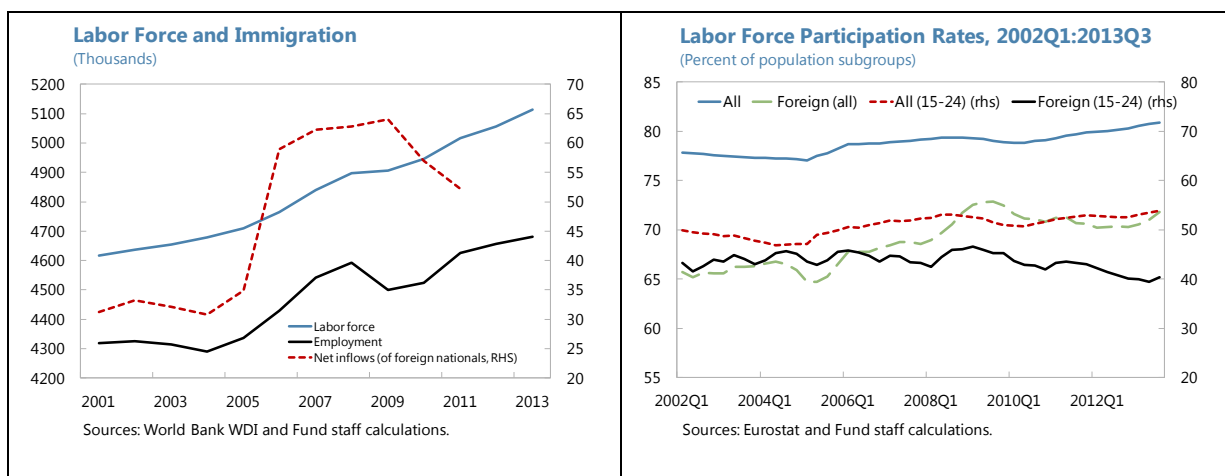
3. The structural deterioration in unemployment has been asymmetric across labor market participants.

The average employment rate for all workers reached nearly 76 percent in 2013:Q3, the highest in over 15 years. By contrast, employment rates among the low skilled, the young, and the immigrants have trended down over time, with the employment rate for young individuals (aged 15–24) at about 47 percent, young foreigners at about 26 percent, and the young low-skilled at 23 percent. Aggregate employment growth, while positive at about ¾ percent in 2013, was moderate in cross-country comparison and insufficient to bring down the unemployment rate in the context of a strong rise in the labor force.



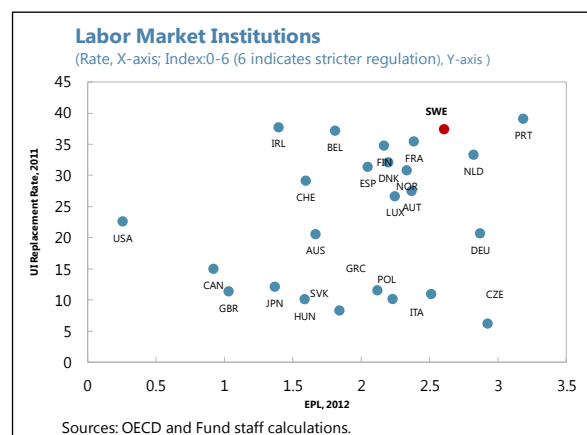
4. Labor force participation increased for several reasons.

(Net) immigration flows increased sharply around 2005 and over the past decade accounted for an annual average of about 1 percent of the labor force. As immigrants are overrepresented in the young and low-skilled segments, they have contributed to the elevated unemployment rate. Labor force participation also increased domestically, including especially among the Swedish-born aged 15–24, likely reflecting improved employment expectations in the context of labor market reforms in recent years which focused on facilitating labor market entry of the young and low-skilled (Box 2), but which for many have not (yet) translated into employment. Labor force participation was likely also helped by robust wage gains, which averaged about 3 percent annually since 2005. Reflecting these dynamics, a divide has emerged in the Swedish labor market, with healthy, and declining, unemployment among high-skilled, Swedish-born, prime-age workers, and increasing unemployment rates among other, more vulnerable groups.



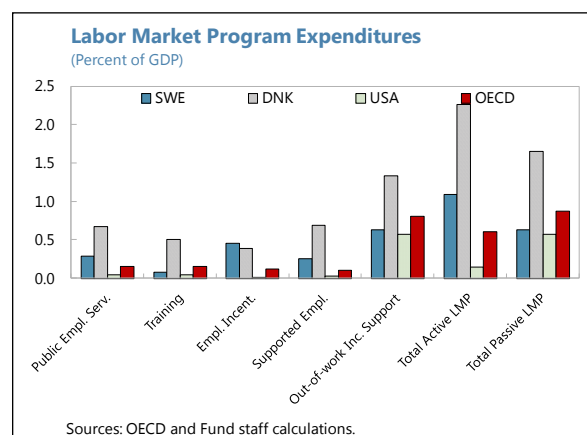
B. The Swedish Labor Market Model

5. Recent developments are linked to the uniqueness of Swedish labor market institutions. Social insurance and redistribution are important pillars of Sweden's labor market model, distinguishing it from the Anglo-Saxon model with relatively lower social protection. But Swedish institutions also differ in important ways from the *flexicurity* model, the approach often associated with Nordic labor markets. In its essence, flexicurity ("protect workers, not jobs") aims to combine flexible labor reallocation (via low employment protection (EPL) and active labor market measures (ALMP)) with generous insurance of workers against labor market risk (e.g., via unemployment insurance (UI) systems). In practice, none of the Nordic countries fully adhere to this model, but Sweden has diverged from it somewhat more so than others.

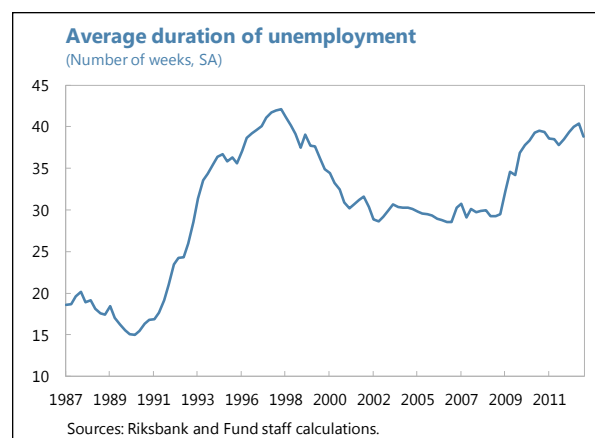


6. Key aspects of the Swedish labor market policies and institutions are as follows:

- *Unemployment insurance (UI)* is generous in Sweden, especially over longer unemployment spells. Based on OECD data, the net unemployment benefit replacement rate for a representative household was about 60 percent in 2012, somewhat below the median of about 70 percent in most other European economies. However, Swedish UI is substantially more generous when viewed over longer horizons—



averaged over 60 months of unemployment, the net replacement in Sweden is 44 percent, compared to the EU average of 34 percent. Generous UI systems cushion the financial impact of a job loss and can help lead to a more productive next job by providing the unemployed with the resources to search more exhaustively. But more generous UI systems also reduce individual's incentives to accept job offers at wages that might otherwise be acceptable, thereby lengthening unemployment spells. A relative slow UI benefit decline as in Sweden matters more the higher the fraction of long-term unemployment. The increase in the duration of unemployment in recent years is especially concerning in this context.



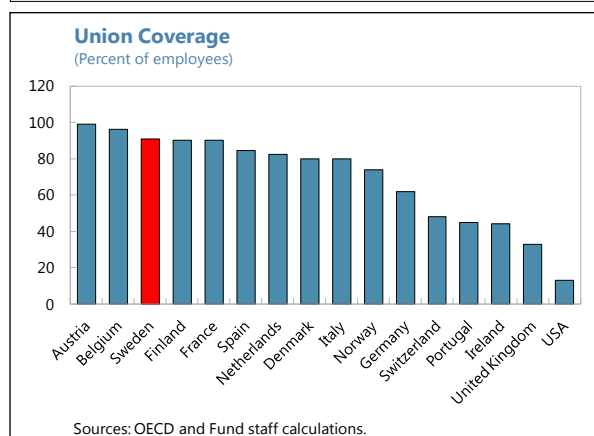
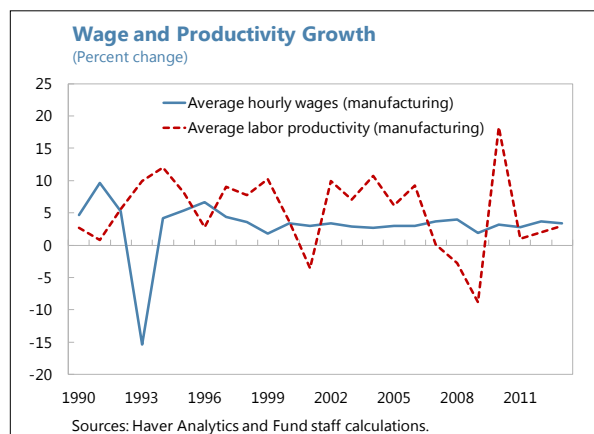
- *Active Labor Market Programs (ALMPs)* have been an integral part of Sweden's labor market set-up and encompass a large numbers of programs, targeted at various subgroups. That said, in 2011, ALMP expenditure in Sweden accounted for 1.7 percent of GDP, slightly above the OECD average, but substantially below the levels in some of its Nordic peers (e.g., 2½ percent of GDP in Finland and nearly 4 percent in Denmark). At less than $\frac{1}{10}$ percent of GDP, spending on job training has been particularly low, amounting to about $\frac{1}{2}$ the expenditure in Norway and $\frac{1}{5}$ of that in Denmark and Finland.
- *Employment protection* of regular contracts in Sweden is among the highest in Europe, and exceeds the levels in all Nordic peers, while lay-off restrictions on temporary contracts are among the lowest. Thus, Sweden has one of the most asymmetric employment protection legislations in Europe, a feature that tends to be associated with increased labor market duality (defined as the share of employees in non-permanent contracts) in cross-country comparison. High job protection often gives rise to insider-outsider dynamics, as the protected have little reason to adjust wages.



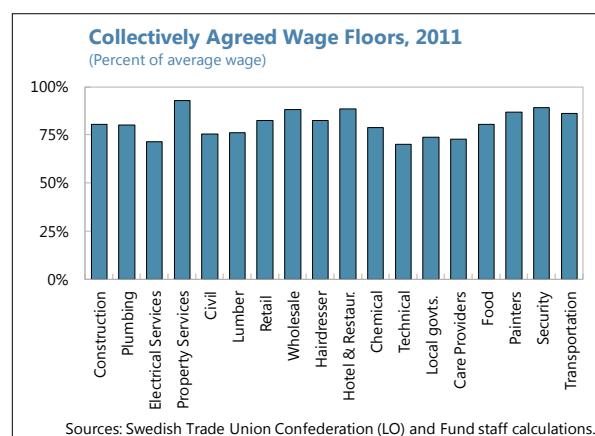
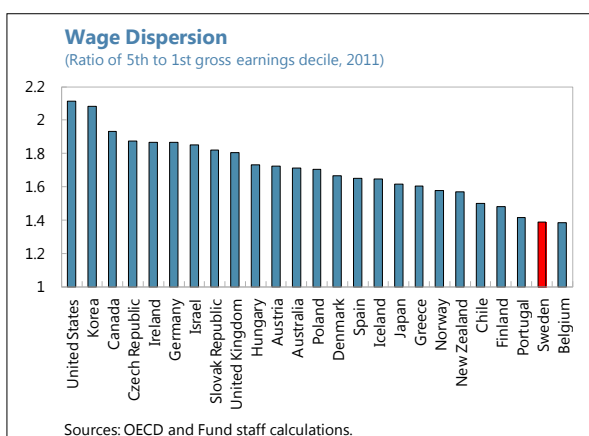
7. Wage adjustment is shaped by broad union coverage. Collective bargaining is a key pillar of wage determination in Sweden. Both membership (union density) and coverage (the share of individuals covered by union agreements independent of membership) are high: union density was about 70 percent of workers in 2012, on par with Nordic peers Denmark and Finland,

but exceeding unionization levels in the rest the EU. Union coverage was even higher at over 90 percent (in 2011), surpassed only by Austria and Belgium.

8. The collective bargaining process is highly coordinated. Coming out of the crisis of the early 1990s, unions, employers and the government agreed on the need for increased cooperation in incomes policies (Thomas, 1998). Partly as a result, while collective bargaining in Sweden today takes place at the sectoral level, it is highly coordinated across industries, and with the national industry agreement setting the example for the remaining labor market. The national agreements regularly set the floor on wage increases at the firm/local level. Pay agreements typically take place every three years, with the latest agreement in 2013 specifying a cumulative 6.8 percent salary increase over a 3-year period for industrial workers. While the Swedish system shares similarities with the German bargaining framework (Box 3), it provides for less scope at the firm-level to adjust wages to local conditions, with implications for wage outcomes.



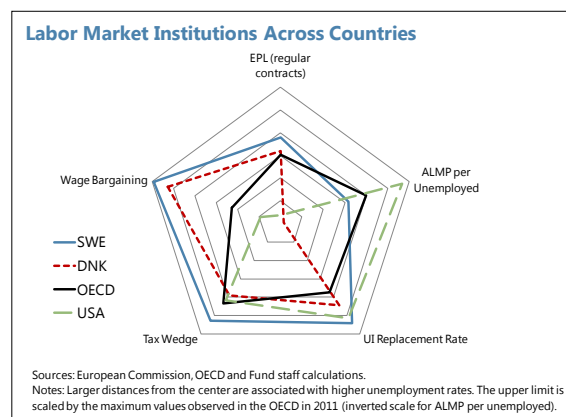
9. On average, the Swedish bargaining framework has led to wage growth broadly in line with productivity. Following double-digit nominal wage increases during the 1980s, reforms to Sweden's collective bargaining framework have helped moderate (manufacturing) wage growth to about 3 percent annually on average since 2000. Strong average labor productivity growth of nearly 4 percent annually has resulted in declining unit labor costs, supporting also Sweden's external competitiveness.



10. But wage stability may have come at the cost of more limited wage flexibility.

Stable and moderate wage growth has come along with a highly compressed wage distribution: the difference between the median wage and the bottom 10th percentile is the second-lowest in the OECD.³ The high degree of wage compression reflects at least in part high collectively bargained wage floors—these amounted to over 80 percent of actual average wages, suggesting that wage floors were in many cases binding. As a point of comparison, collectively agreed wage floors in Germany were in most sectors closer to about ½ of average hourly earnings.^{4,5}

11. Overall, Swedish labor market institutions differ in important aspects from those in other countries. They are substantially different from the Anglo-Saxon model, as represented by the USA, but also differ in important ways from an idealized flexicurity model, perhaps best represented by the current Danish set-up. The question is to which degree this uniqueness comes at a price. To contribute to this discussion, the following section aims to quantify the changes in labor market outcomes that could be expected from adjustments to the the Swedish labor market setup along some, or all, dimensions discussed above—keeping in mind that there is no absolute benchmark, and that the “optimal” labor market model will depend on societal characteristics and preferences.



C. A Quantitative Perspective

12. Which labor market institutions matter most for labor market outcomes? A call for policy actions requires a deeper understanding of which factors actually impact labor market outcomes, and in what magnitudes. To examine this, a panel, fixed effects model is estimated, with the baseline regression taking the following form:

$$Urate_{it} = Constant + \sum_j \beta_j Institution_{jit} + Inflation_{it} + OutputGap_{it} + Country_i + \varepsilon_{it} \quad (1)$$

³ Sweden ranks at or near the bottom also if the ratio of 90th to 10th percentile is used or inequality across family incomes is used (see CIA World Factbook, where Sweden ranks as the most equal society).

⁴ While a detailed, sector-by-sector comparison in Germany is not available, as of April 2014, branch-specific, collectively bargained hourly wages in Germany averaged €10.5/hour, compared to average hourly wages of about €20 in the 4th quarter of 2013. See <https://www.destatis.de/EN/FactsFigures/NationalEconomyEnvironment/EarningsLabourCosts/EarningsLabourCosts.html>.

⁵ As the analysis below indicates, unemployment outcomes and unions are linked via the wage channel.

where the dependent variable is the (total) unemployment rate in country i at time t , regressed on a set of labor market institutions (indexed by j), inflation, the output gap, and a country-fixed effect. The specification is intentionally kept parsimonious, focusing on steady-state correlations between institutions and outcomes, with inflation and the output gap included to control for cyclical factors and country fixed effects to capture country-invariant characteristics.

13. The empirical analysis reveals the complexities of designing labor market institutions (Table 1). Column (1) shows a basic regression controlling for the roles that inflation (along the lines of the Philips curve concept) and cyclical dynamics (Okun's Law) play in determining the unemployment rate. As the discussion above indicated, while the estimation highlights that cyclical factors matter in general, they explain only some of the increase in Swedish unemployment since the crisis. This points to the importance of structural factors in the Swedish labor market in recent years. The remaining specifications explore the effects of key labor market institutions in addition to cyclical factors.⁶ In particular:

- Column (2) indicates that the impact of ALMP⁷ is statistically significant and in the expected direction, with greater ALMP expenditure per unemployed associated with lower unemployment. At the same time, column (5) suggests that the impact of ALMP expenditure is not evenly distributed across programs, with programs providing training showing a relatively higher impact than others.
- While the coefficient for EPL is negative and not statistically significant,⁸ column (3) shows that it is EPL on regular contracts (EPL^R) that has appears to matter most: higher EPL^R has a large impact on increasing unemployment, while EPL on temporary contracts (EPL^T) appears to matter less (for aggregate unemployment). However, column (4) shows that while the level of EPL^T might not matter, large *differences* between EPL^R and EPL^T do.

⁶ While this set-up is simple and serves to illustrate equilibrium relationships between unemployment and the various policy variables without accounting for dynamics or causal effects, the estimated orders of magnitude are consistent with those found in other contexts. For example, in a DSGE model calibrated to France, Espinoza and Pérez Ruiz (forthcoming) find that a 1 ppt. tax wedge reduction would raise employment between 0.1 (short run) and $\frac{2}{3}$ (long run) percent, compared to about a 0.4 percent employment increase implied by the tax wedge coefficient in column 7. Also based on a model simulation, Anderson et al. (2014) find that the average country would experience long-run employment effects of about 3 percentage points from labor market reforms that close the gap with a set of benchmark economies.

⁷ Expenditure on ALMPs is measured as total expenditure per unemployed individual, which helps to control for the possibility that expenditures as a percent of GDP increase when unemployment rises, without necessarily a change in spending per individual, which is what matters most.

⁸ Theoretically, the effect of firing restrictions is ambiguous: EPL makes job destruction more costly, reducing the flow into unemployment, but it also raises firms' cost of creating a vacancy (by reducing the option value of a job), thus reducing the flow out of unemployment.

Table 1. Total Unemployment and Labor Market Institutions

Dependent variable: VARIABLES	(1)	(2)	(3)	Unemployment rate				
				(4)	(5)	(6)	(7)	(8)
EPL		-1.000*** (0.245)					-0.103 (0.309)	
ALMP expenditure per une			-0.059*** (0.007)				-0.057*** (0.007)	-0.053*** (0.007)
UI replacement rate				0.114*** (0.010)			0.115*** (0.024)	0.111*** (0.023)
Tax wedge					0.292*** (0.025)		0.400*** (0.036)	0.397*** (0.035)
Collective bargaining						0.020* (0.010)	0.014 (0.028)	0.020 (0.028)
Inflation	-0.029*** (0.004)	-0.083*** (0.021)	-0.077*** (0.030)	-0.109*** (0.023)	-0.143*** (0.026)	-0.115*** (0.014)	-0.010 (0.062)	-0.102 (0.065)
Output gap	-0.297*** (0.024)	-0.548*** (0.034)	-0.446*** (0.032)	-0.246*** (0.030)	-0.500*** (0.033)	-0.268*** (0.025)	-0.429*** (0.046)	-0.423*** (0.045)
EPL (regular)								2.068*** (0.546)
EPL (temporary)								-0.187 (0.155)
Constant	7.093*** (0.076)	10.019*** (0.501)	8.761*** (0.157)	4.085*** (0.325)	-0.464 (0.804)	6.326*** (0.393)	-7.834*** (1.655)	-12.651*** (2.013)
Observations	1,404	756	686	961	629	1,017	385	385
R-squared	0.130	0.306	0.347	0.228	0.412	0.166	0.561	0.580
Number of countries	45	40	32	29	27	32	19	19

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

- The degree of unionization affects unemployment: as predicted by theory, higher unionization rates are associated with higher unemployment, as shown in columns (6) and (7). This association can best be understood in the context of the wage channel—as Table 3 indicates, more unionized labor markets are associated with both higher wage growth and stronger wage compression, both of which can impede job creation especially for low-skill, low-productive jobs.
- The UI replacement rate is positively and significantly associated with higher unemployment, reflecting the well-known fact that more generous UI systems provide incentives for individuals to be more selective about job offers and search for longer.

14. Youth unemployment has similar determinants, with subtle differences (Table 2). First, EPL does not have a statistically significant impact. A possible explanation is that EPL^T may be more relevant for youth, who are more likely to be in temporary work arrangements, where EPL appears to generally be less effective (Table 1). Similarly, UI benefits are not statistically significant, which is plausible given that many youth may not be eligible for UI benefits. By contrast, the impact of ALMP remains important, and the difference between general expenditure and those on training is even more pronounced. So is the impact of unionization,

Table 2. Youth Unemployment and Labor Market Institutions

Dependent variable: VARIABLES	Youth unemployment rate							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPL		-5.030*** (1.002)					-1.413 (1.113)	
ALMP expenditure per unemployed			-0.161*** (0.029)				-0.197*** (0.032)	-0.201*** (0.032)
UI replacement rate				0.032 (0.046)			0.166*** (0.063)	0.153** (0.064)
Tax wedge					0.118 (0.079)		0.316*** (0.106)	0.303*** (0.106)
Collective bargaining						0.039 (0.078)	0.101 (0.100)	0.154 (0.110)
Inflation	-0.300** (0.129)	-0.376** (0.179)	-0.390** (0.161)	-0.592*** (0.187)	-0.273* (0.141)	-0.545*** (0.170)	-0.450** (0.196)	-0.420** (0.198)
Output gap	-0.869*** (0.070)	-0.941*** (0.088)	-0.620*** (0.077)	-0.733*** (0.094)	-0.868*** (0.074)	-0.638*** (0.086)	-0.574*** (0.099)	-0.569*** (0.099)
EPL (regular)								-3.883 (2.764)
EPL (temporary)								-0.724 (0.556)
Constant	13.807*** (0.382)	24.782*** (2.117)	16.894*** (0.657)	13.113*** (1.571)	10.564*** (2.531)	12.478*** (2.766)	1.956 (4.840)	8.709 (7.518)
Observations	391	303	288	279	348	287	219	219
R-squared	0.380	0.380	0.362	0.252	0.389	0.273	0.423	0.427
Number of countries	28	23	22	20	26	22	18	18

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

which can be understood in the context of the insider-outsider conflict, and the costs of unions disproportionately falling on the youth (who, on average, are “outsiders”).⁹

15. The impact of union coverage on labor market outcomes seems to be linked to their role in shifting and compressing the wage distribution (Table 3).¹⁰ Column (1) in Table 3 confirms the expected determinants of wage growth, including productivity growth and inflation as well as the cyclical pressures.¹¹ However, unions impart an additional wage premium, in line with the theoretical predictions of standard union models. But beyond raising the average wage, unions are also associated with more compressed wage distributions: the spread between the median wage and the bottom 10th percentile is significantly narrower the higher unionization (column (3) shows the analogous result when considering the 90th percentile rather than the median). Both effects are important: higher average wages imply a lower overall labor demand,

⁹ See also IMF (2014).

¹⁰ In an alternative specification, the tax wedge was also included, but was not statistically significant, consistent with the notion that the tax wedge would affect the level of wages, but not their growth rate or dispersion. To maximize sample size, it is excluded from the estimates reported here.

¹¹ Including the unemployment rate instead of the output gap leads to similar results.

Table 3. Wages and Collective Bargaining

Dependent variable: VARIABLES	Hourly wage growth (1)	Median/10th percentile wage (2)	90th/10th percentile wage (3)
Collective bargaining	0.034* (0.018)	-0.005*** (0.001)	-0.020*** (0.004)
Labor productivity growth	0.333*** (0.029)		
Hourly wage growth		-0.001 (0.001)	-0.004 (0.004)
Inflation	1.011*** (0.027)	-0.004* (0.003)	-0.008 (0.008)
Output gap	0.149*** (0.043)	0.002 (0.001)	0.005 (0.004)
Constant	-0.238 (0.686)	1.838*** (0.050)	3.801*** (0.158)
Observations	860	215	215
R-squared	0.678	0.079	0.111
Number of countries	25	23	23
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

and a more compressed wage affects those groups where wage flexibility is most important—at the bottom end of the wage distribution, where most of the unemployment (low-skilled, young, immigrants) is concentrated.

D. Policy Implications

16. Overcoming Sweden's labor market challenges will require comprehensive reform.

The Swedish labor market has performed well after significant reforms were implemented in the early 1990s, with the unemployment rate declining from nearly 10 percent in the mid-1990s to about 5½ percent in 2000. However, since then, unemployment has trended upwards again despite additional reforms since 2000. The structural deterioration in labor market outcomes reflects in part important changes in the labor market environment: significant immigrant inflows (often with initially insufficient skills) and (globally) increased need for skilled labor has left current labor market institutions unable to integrate the added labor supply into productive employment.¹² While the Swedish system continues to do well in terms of achieving social equity objectives, it has coped less well with the need to match a changing labor force with the need for increasingly high-skilled employment. This points to reform needs along a number of dimensions.

¹² A large literature following Ljungqvist and Sargent (1998) has shown how the performance of labor market institutions can vary with changes in the economic environment.

Table 4. Potential Gains from Adjusting the Swedish Labor Market Model

Change in Policy to get to:	DNK	USA	OECD
EPL (regular)	-0.4	-2.4	-0.5
EPL (temporary)	0.0	-0.6	0.0
ALMP per Unemployed	20.6	0.0	0.0
UI Replacement Rate	-6.9	-1.8	-11.9
Tax Wedge	-9.9	-8.0	-6.7
Collective bargaining	-0.8	-58.2	-42.5
Unemployment rate reductions from closing 1/2 the gap:			
EPL (regular)	0.4	2.4	0.5
EPL (temporary)	0.0	-0.1	0.0
ALMP per Unemployed	0.5	0.0	0.0
UI Replacement Rate	0.4	0.1	0.7
Tax Wedge	2.0	1.6	1.3
Collective bargaining	0.0	0.6	0.4
All	3.3	4.7	3.0

Source: Fund staff calculations.

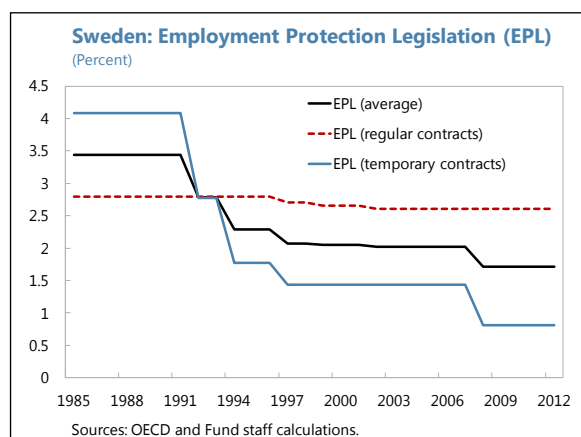
17. On the labor demand side, a number of measures will be key, including securing wage flexibility at the firm level and for the most vulnerable, a reformed EPL, and an improved business environment.

- *Wage flexibility.* Limited wage adjustment at the low end of the wage distribution holds back employment growth among the most vulnerable groups, including the young and the low-skilled. It is important that the collective bargaining framework allows firms and workers to find wage agreements that reflect overall macro and (un)employment conditions as well as firm-specific factors. Increased wage flexibility in collective agreements (proxied by union coverage in the regressions), for example, by introducing additional scope for firms to deviate from national agreements under certain conditions, could lower unemployment by more than ½ percentage point if the USA model was adopted (Table 4). In this context, while UI generosity is high in Sweden, which likely contributes to elevated reservation wages, wage flexibility seems to be the more crucial factor—with collectively bargained wage floors at 80 percent of average wages, they are likely the binding constraints on job creation.
- *Employment protection.* Overall, EPL is high in Sweden. Although it has come down substantially since the mid-1980s, this was driven primarily by the deregulation of temporary contracts. EPL on permanent contracts has remained high and associated with a lack of labor demand.¹³ Reduced EPL would also facilitate labor reallocation and enhance productivity

¹³ Advance notice requirements for redundancies are among the highest in the world, especially for workers with more than five years of tenure. Sweden also has burdensome redundancy rules, including certain retraining

(continued)

growth which has slowed down to pre-1990 levels, from near double-digits during much of the 1990s and 2000s. Reducing employment protection on regular contracts, especially via shorter advance notice requirements, could lower unemployment by between $\frac{1}{2}$ (Denmark, OECD average) to $2\frac{1}{2}$ (USA) percentage points, depending on the benchmark.



18. Measures to strengthen labor market matching would also help. Key

among them are ALMPs, which are generally viewed as helpful for improving labor market matching—a result reflected in the empirical results discussed above. Consequently, an increase in ALMP expenditures closer to, for example, the Danish level could lower unemployment by $\frac{1}{2}$ percent. But the composition of ALMP spending also matters. As shown earlier, Sweden lags behind Denmark especially in terms of training expenditures and job matching services (public employment services), while having an elevated level of expenditures on employment incentives. Wage subsidies are costly and have ambiguous effectiveness, as short-term subsidies often do not lead into long-term employment, and because they often do not generate additional employment.¹⁴ By contrast, training programs can have a longer-lasting impact by providing the unemployed with basic work skills. A refocusing of ALMPs on those areas most cost effective can help both labor market efficiency and rationalize expenditures. But adjusting the scheme of UI benefits should also be considered: while initial UI levels are in line with other countries, the long benefit eligibility exacerbates the decline in matching efficiency and the recent increase in unemployment duration. A steeper decline in UI benefits would provide additional incentives for accepting jobs—however, this is unlikely to be helpful as long as low-wage flexibility is not improved.

19. Importantly, reforming Sweden's labor market does not mean compromising on its basic tenets. Moving Sweden's labor market institutions to the "best frontier" level in each of its dimensions would have an estimated unemployment-reducing effect of over 6 percent, but this

and/or reassignment obligations before redundancy dismissals can take place, as well as priority rules for redundancy dismissals, lay-offs and re-employment. See

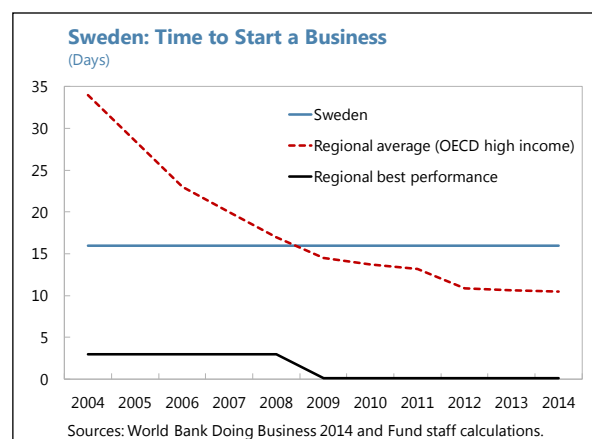
<http://www.doingbusiness.org/data/exploretopics/employing-workers>.

¹⁴ Net job creation associated with wage subsidies is often small, as employers often switch existing hiring plans into subsidized areas, rather than creating new positions. There is also evidence that some of the Swedish programs (New Start) have little to no lasting employment impact on the most vulnerable groups they are intended for.

may not be desirable.¹⁵ Swedish labor market institutions are built on a careful balance of efficiency and equity. A reform package appropriate for Sweden should not abolish its basic tenets, including fostering social dialogue, helping those in need, and ensuring fair incomes. But fine-tuning institutions along key dimensions can have a large impact and help Sweden's labor market meet the challenges of the future. In particular, adding more scope for wage flexibility into Sweden's well-functioning collective bargaining framework, tilting ALMP expenditures to more effective and efficient programs, and allowing for easier labor reallocation through lower EPL could lower structural unemployment substantially while maintaining Sweden's model.

20. Measures outside the labor market are also important to improve (un)employment outcomes.

- *Housing supply* restrictions contribute to rising house prices, which have created financial stability risks but also inhibit labor reallocation by making it costly to move into metropolitan areas with higher labor demand. Addressing housing market inefficiencies would therefore help address both financial sector and labor market challenges.
- *Business entry requirements.* New business formation is an important driver of labor demand. While Sweden still performs satisfactorily overall, its ranking on the World Bank's 2014 *Doing Business* analysis dropped to 61 from 55 in 2013 (driven in part by the subcategories "starting a business" and "getting (corporate) credit"). The deterioration reflects largely an improvement in comparator countries rather than an absolute decline in Sweden, however, in an increasingly globalized world, falling behind can mean losing out on, for example, FDI inflows.¹⁶
- *Vocational training.* The usefulness of ALMP-training measures notwithstanding, they cannot substitute for an educational system, including vocational training. Ongoing efforts by the authorities are to be commended, but a fundamental vocational system, for example, along the lines of the German system, would help provide the Swedish labor force with needed skills and support needed productivity growth.¹⁷



¹⁵ Such calculations must be qualified: the estimation methodology does not account for interactions, and it is likely that the cumulative effect is not equal to the sum of the individual impact estimates.

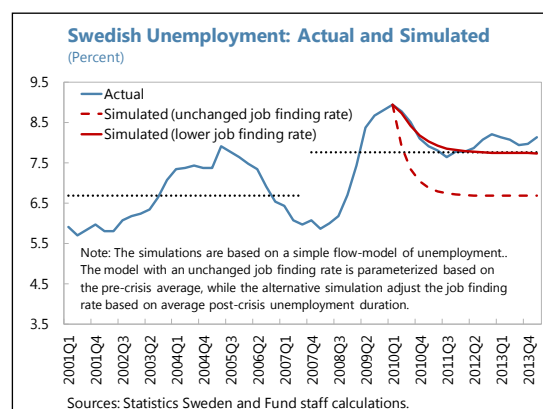
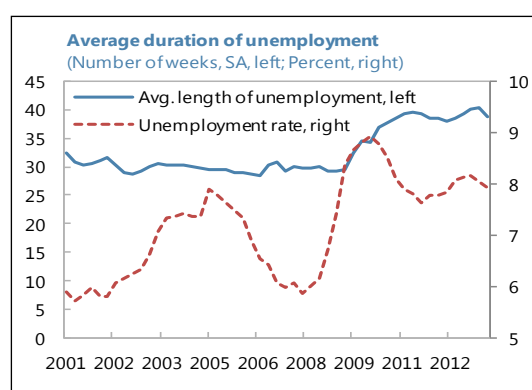
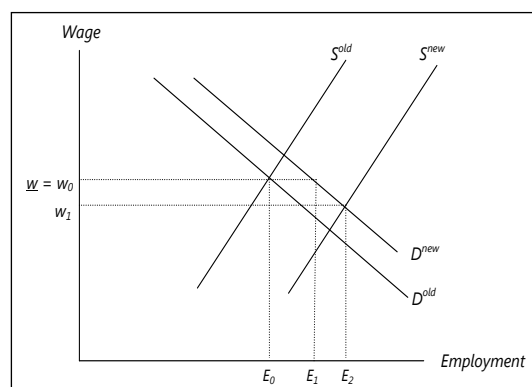
¹⁶ See <http://www.doingbusiness.org/data/exploreeconomies/sweden/#starting-a-business>.

¹⁷ See, e.g., proposals in the OECD's 2011 *Reviews of Vocational Education and Training—Learning for Jobs* and the Swedish government's [policy plans](#) announced in the 2014 Fall Budget Bill.

Box 1. Cyclical versus Structural Factors in the Swedish Labor Market

Changes in the Swedish labor market reflect both cyclical and structural factors. Starting around 2006, the Swedish authorities initiated a broad set of labor market reforms (see Box2). These measures increased effective take-home pay for many groups, contributing to an expansion of the labor force as the rewards for job search increased and the administrative incentives for labor force participation were strengthened. In the context of a simple demand-supply framework, this corresponds to a shift in the labor supply curve. While a robust recovery from the crisis brought about an expansion of labor demand, overall employment growth ultimately fell short of that in the labor force and led to a substantial increase in unemployment. As the model illustrates, a lack of wage adjustment likely played an important role in this outcome: with supply growth exceeding that in demand, reaching the new equilibrium (E2) requires a downward adjustment in the wage (to w_1). However, if the wage level remains close to the prior wage (w), employment growth will be limited (at E1). Low inflation in Sweden has meant that real wages did not adjust either. Over time, if real wages adjust—through nominal wage adjustment, inflation, or both—and if labor demand recovers further, employment increase. Whether the improvement would translate into a reduction of unemployment to pre-crisis levels depends on the wage setting process and, more broadly, on the evolution of structural employment.

Other models suggest that structural unemployment has increased in recent years. Search-theoretic models view unemployment as a function of inflows (job destruction) and outflows (job creation), with outflow rates inversely related to the average length of unemployment. A marked increase in the average unemployment duration since about 2008 suggests lower job finding rates in Sweden. A search-based model parameterized in part based on unemployment duration data suggests that unemployment has increased permanently, that is, structural has increased from about 6½ percent during the pre-crisis years to over 7½ percent since the crisis.



Box 2. Major Labor Market Reforms over the Past Two Decades

Sweden has undertaken substantial structural reforms over the past two decades. A first wave of reforms took place after the banking crisis in the early 1990s and included both product and labor market reforms.¹ Major milestones related to labor markets included²

- *Tax reforms* to shift the tax burden from labor income to consumption and capital income through lower marginal tax rates on earned income and other measures;
- *Wage restraint* through an agreement by industrial unions to restrain wage increases; more coordination in wage bargaining; and re-establishing the leadership role of those sectors most exposed to international competition; and
- *Reform of labor market institutions*, including a reorientation of active labor market policies toward training programs; reduced employment protection; and reforms to social insurance (including lower UI replacement rates).

A second wave of labor market reforms started with the incoming government in 2006. A strategy for labor market reforms aimed at addressing unemployment and poverty traps was implemented in steps over the following years and often targeted at non-prime age workers (the very young and the very old). Key measures involved reducing the tax burden for low-wage jobs through income tax deductions, a greater focus of ALMPs on training and job matching, and reductions in unemployment and sickness benefits. Others included providing wage subsidies to employers hiring vulnerable groups (New Start Jobs), immigrants (Step-In Jobs), or the previously sick (Well Again Jobs). More recently, as part of the Budget Bill for 2014, the authorities proposed measures to further reduce the low-wage tax burden, through an increase in the earned income tax credit. The budget bill also included plans to improve vocational training in Sweden (e.g., through wage subsidies to support “vocational introduction agreements” between social partners in a number of occupational sectors and for employers who offer apprenticeship training) and to reduce youth unemployment. The bill also included measures to provide resources for a short-time work program, intended for use in a particularly deep economic crisis.

¹ Major product market reforms in Sweden included deregulation in a number of sectors, including especially the telecommunications sector, and earlier (in the 1980s) measures to promote competition. These reforms are seen to have fostered rapid restructuring and created large productivity gains in the export sector.

² See also Box 3.3 in the IMF’s EUR REO October 2011.

Box 3. Collective Bargaining and Economic Outcomes

The relationship between collective bargaining and economic outcomes is theoretically complex. Early models, such as Dunlop's (1944) "monopoly union" model or Nickell and Andrews' (1983) "right-to-manage" model, found that greater union bargaining power results in higher wages and lower employment, with unions effectively choosing a point on the downward-sloping labor demand curve. Insider-outsider conflicts (e.g., Lindbeck and Snower, 1988) often also lead to higher wages and lower employment, as insiders exploit their position at the expense of outsiders. Richer models, where unions negotiate over variables other than just the wage (such as the level of employment), can change these findings. In addition to affecting the average wage, models with worker heterogeneity (e.g., differences in skill levels) typically find that collective bargaining reduces the spread of wages compared to the case where workers are paid based on marginal productivity (e.g., Cahuc and Zylberberg, 2004, Alvarez and Shimer, 2011). The empirical literature tends to support the main findings in the theoretical literature. A large empirical literature has found substantial union wage premia, with estimates ranging from 8 percent in the UK (Booth, 1995) to 15 percent in the US (Lewis, 1986; Blanchflower and Bryson, 2002). More unionized labor markets also appear to be associated with more compressed wage distributions, with, for example, Kahn (1998, 2000) finding lower wage inequality in OECD economies with larger collective bargaining coverage.

The degree of centralization and coordination of bargaining also matters. Collective bargaining can take place at many levels: the firm, the sectoral (or industry), or the national level. Calmfors and Driffill (1988) famously hypothesized a hump-shaped relation between the degree of centralization of bargaining and the unemployment rate, arguing that in centralized regimes, trade unions internalize the adverse impact of higher wages in inflation and unemployment, while in decentralized regimes, limited market power by firms constrains wage increases. However, at intermediate levels of bargaining (industry level), both market forces and wage internalization effects may be too weak to restrain wage increases, thus leading to relatively higher wage outcomes and lower production and employment. Empirical evidence on this relationship is mixed. While some authors have subsequently found some empirical support (e.g., Scarpetta, 1996, and Elmeskov et al., 1998), the majority of empirical studies have not (Flanagan, 1999). Measurement problems are likely one of the main reasons for the mixed empirical findings. Similarly classified countries may differ in crucial details. For example, while collective bargaining in both Germany and Sweden takes place mostly at the sectoral level and is highly coordinated, with certain sectors acting as "pacesetters" for other sectors, firm-level agreements and opening clauses in Germany impart a large degree of flexibility that is absent in Sweden.

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