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REPUBLIC OF POLAND

Selected Issues

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Approved by the European Department

April 16, 2010

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**CHAPTER I. COPING WITH CAPITAL FLOWS UNDER AN INFLATION TARGETING REGIME:
LESSONS FOR POLAND[1]**

A. Introduction

1.   **As the global financial crisis wanes, with declining risk aversion, Poland could be affected disproportionally by a rebound in capital flows to Emerging Europe.** As the only EU economy to avoid outright recession during the crisis, Poland is likely to attract renewed risk appetite. In particular, as investors begin to differentiate across the region, Poland could become one of the main recipients of capital inflows. This could lead to excessive exchange-rate appreciation, which would undermine competitiveness. Moreover, rapid capital inflows, especially when associated with a domestic credit boom, can create the conditions for overheating of the economy. The recent global crisis shows that such risks should not be underestimated and suggests the need to be prepared to adopt policies to stem excessive inflows.

2.   **The policy response to excessive capital inflows can be multidimensional.** While fiscal tightening is generally seen as a useful policy response, in practice it has been used only to a limited extent.[2] The conventional wisdom in the literature and among policymakers points to exchange rate flexibility as an appropriate response to capital inflows.[3] Indeed, Poland's adoption of inflation targeting in 1998, concurrent with the introduction of a free-floating exchange rate regime, was in part motivated by the rapid capital inflows in the late 1990s.[4] However, persistent exchange rate appreciation, especially if not justified by the underlying fundamentals, can lead to overshooting and attendant macroeconomic instability. Indeed, past experience suggests that there is scope for a less-conventional response, including through foreign-exchange intervention and macro-prudential regulations.

3.   **Purchases of foreign-exchange (FX) can help dampen exchange-rate appreciation, while boosting official reserves.** Under certain circumstances, intervention in the foreign exchange market can be a prudent strategy to resist unwarranted appreciation. The recent Israeli experience with reserves accumulation provides an example of an intervention strategy that was successful both in stemming rapid exchange rate appreciation and maintaining a credible inflation-targeting framework.

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[1] Prepared by Natan Epstein, Manuela Goretti, and Erlend Nier, with research assistance from David Velazquez-Romero.

[2] Evidence from emerging markets suggests that the growth in real government expenditure tends to rise strongly during periods of large net private capital inflows (see WEO, Fall 2007).

[3] See Ostry et al. (2010).

[4] See Freedman and Otker-Robe (2009).

4.   **Targeted macro-prudential regulation can help stem capital inflows, while strengthening the financial sector.** While the main objective of such policies is not to curb capital inflows or reduce upward pressure on the exchange rate per se, macro-prudential measures have shown to be effective in mitigating the risk of rapid credit growth and credit fuelled bubbles in asset markets. Similarly**;** under certain conditions, targeted prudential measures can be effective in mitigating vulnerabilities created by foreign-currency denominated lending.

5.   **The structure of the paper is as follows.** Section II provides some stylized facts on past and recent capital inflows to Poland. Section III discusses potential policy responses to capital inflows by analyzing the role of three broad intervention strategies, foreign-exchange reserves accumulation, macro-prudential regulations and capital controls. Section IV draws initial lessons for Poland and section V concludes.

B.   Stylized Facts on Capital Flows to Poland and Emerging Europe

6.   **Capital flows to Poland were smaller and less volatile than in other Emerging European countries (Figure 1).** On the whole, capital inflows to Emerging Europe were justified by a real convergence process. But, in certain countries, these inflows became excessive and concentrated in non-tradable sectors, mostly real estate, banking and other services. The resulting absorption boom led to the build-up of substantial external imbalances and, in some cases, abrupt capital flow reversals during the crisis. While Poland experienced a decline in flows, the magnitude was relatively small. Indeed, the volatility of capital flows into Poland has been lower during both the boom and crisis periods, in part due to timely introduction in the boom period of counter-cyclical macro-prudential measures—notably on FX mortgages. More recently, Poland has outpaced the region in both gross and net capital inflows, due to renewed risk appetite for strong emerging markets.
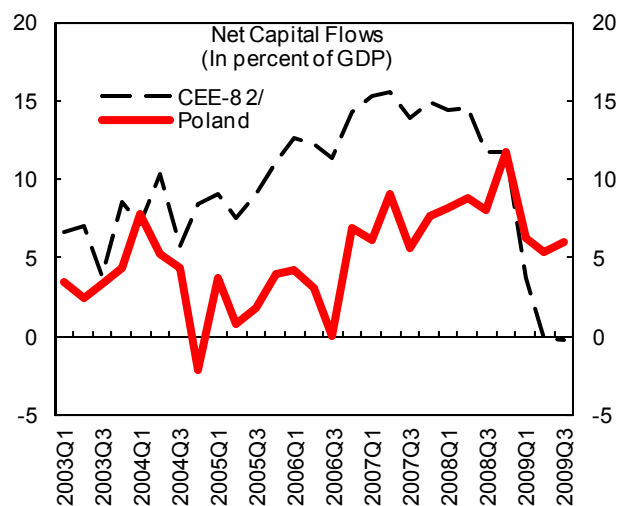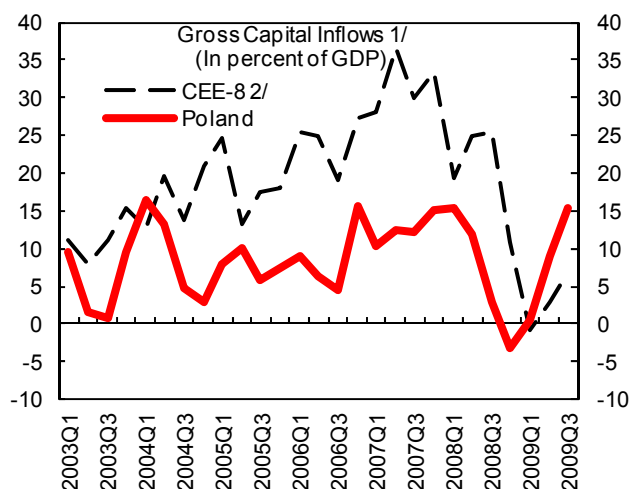
Source: Eurostat.
1/ Total FDI, portfolio debt and equity, other investment liabilities of banks and corporates (loans and currency & deposits).
2/ Includes Bulgaria, Czech Republic, Slovak Republic, Estonia, Hungary, Latvia, Lithuania, and Romania.

Figure 1. Poland: The Boom Years, Cross Country Comparison

Total inflows into Poland were limited compared to peers, resulting in relatively more modest credit growth.

Domestic demand and the current account increased, but also relatively less than in other CEEs.
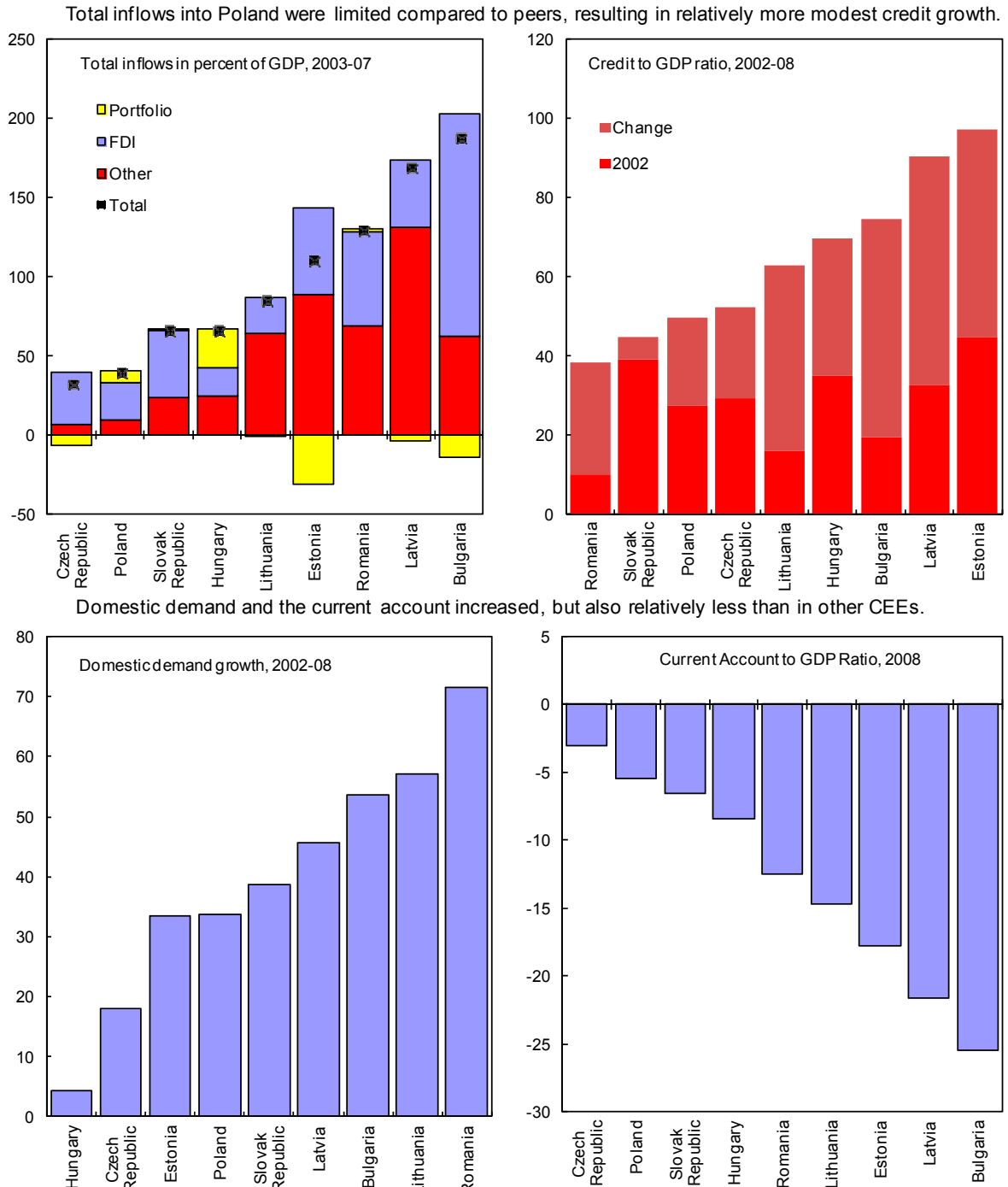
Sources: IMF, World Economic Outlook; IMF, International Financial Statistics; and IMF staff calculations.

C. Policy Response to Capital Inflows

Foreign-Exchange Market Strategy

Intervention in the foreign-exchange market can be a prudent strategy to resist appreciation, once the REER rises beyond what is justified by fundamentals—with implications for competitiveness and medium-term growth— and if the authorities see scope for building up foreign reserves. In this context, the recent Israeli experience provides a useful illustration of a successful example of intervention policy aimed at building adequate precautionary reserves in the face of strong capital inflows and exchange rate appreciation, while preserving the credibility of the inflation targeting regime. Moreover, the relatively similar Colombian experience highlights the need for a systematic approach to be timed appropriately with the country's cyclical position.

7.   **In the absence of inflationary pressures, purchases of foreign exchange can complement interest-rate cuts in stemming capital inflows.** Under such conditions, loose monetary policy and purchases of foreign exchange, with minimal sterilization, can stem capital inflows in a manner consistent with the inflation targeting objective. However, under a rising (positive) output gap and overheating economy, attaining the inflation target and stemming capital inflows may give rise to conflicting objectives. Specifically, in the presence of rising inflationary pressures, tighter domestic interest rates will only tend to induce further capital inflows, which would undermine the desired effect of intervention. At the same time, any purchases of foreign exchange would need to be fully sterilized to support tighter monetary conditions, which could be costly.

8.   **A broader assessment of the costs and benefits of building up reserves needs to be considered as well.** While an increase in reserves creates precautionary balances to address potential current and capital account shocks, the benefits need to be weighed against the costs arising from an excessive build-up of reserves. These costs arise from the opportunity cost of foregone consumption and investment—generally proxied by the spread between the interest paid on the country debt and the *risk-free* return of reserves.[5]

The Israeli Experience

9.   **The recent Israeli experience provides an example of successful foreign reserves management consistent with an inflation targeting mandate**. In March 2008, in the face

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[5] There may be additional costs created from excessive risk-taking (as highlighted by the Colombia experience discussed below). See Ricci (2004) and Kim (2008).

of sustained capital inflows and upward pressure on the shekel, and relatively low levels of foreign exchange reserves, the Bank of Israel (BoI) initiated a two-year $10 billion foreign-exchange accumulation program. Following a review of its reserves management, the BoI had identified a target range of $35-40 billion in foreign exchange reserves as being appropriate to the needs of the rapidly growing Israeli economy and its increasing integration into the global economy. In order to avoid an undesirable impact on the exchange rate and to

minimize interference with the market mechanism, the purchase of foreign exchange by the BoI was conducted in pre-announced daily operations. At $25 million per day, the initial purchases were quite small relative to average daily volume in the Israeli foreign exchange market, which at the time was over $2 billion. By mid 2008, the daily intervention size increased to $100 million. In late 2008, following a reassessment of its FX reserve adequacy level, the BoI raised its targeted range to $40-44 billion.

Israel: Foreign Exchange Reserves, billions USD
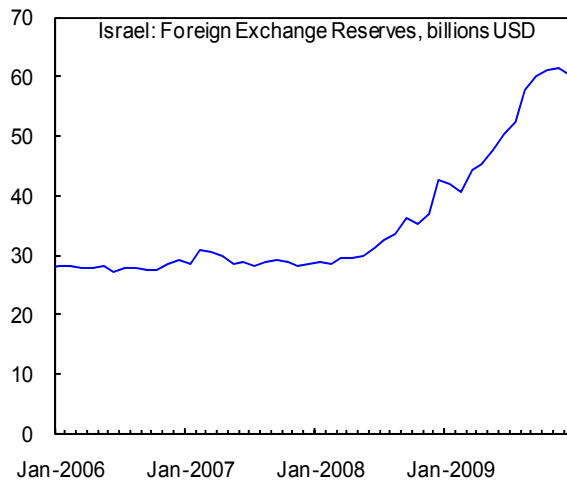
10.   **The intervention strategy has been in line with the announced objectives.** The BoI's revised target was reached by early 2009, a year earlier than initially planned, but the central bank maintained its pre-announced reserve accumulation program until August. Since then, the BoI discontinued its program of daily FX purchases of $100 million, albeit said that it will continue to intervene on a discretionary basis "in the event of unusual movements in the exchange rate which are inconsistent with underlying economic conditions, or when conditions in the foreign exchange market are disorderly."[6]

11.   **In measuring the success of this program, the Israeli authorities point to meeting two key objectives: (i) achieving FX reserves adequacy level and (ii) implementing a transparent and credible strategy so as to preserve the inflation targeting framework.** The first objective was clearly met, notwithstanding that the targeted level was exceeded substantially.[7] The second objective appears to have also been met, as long-term inflationary expectations were continuously anchored within the targeting range. However, the recent shift to a less-transparent discretionary intervention has raised questions among market participants about the credibility of the inflation-targeting regime in the years ahead. While

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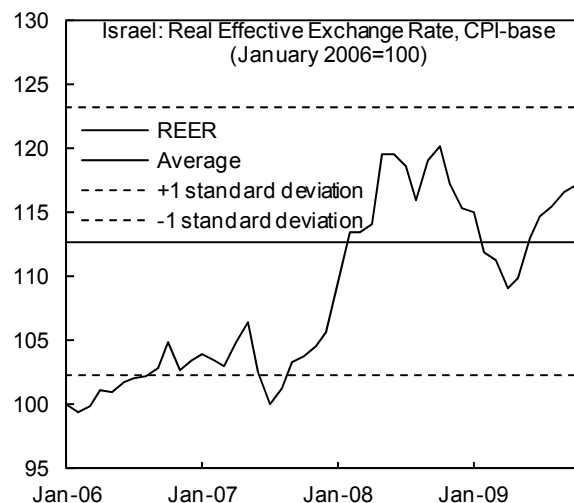[6] Bank of Israel, Press Statement (August 3, 2009), http://www.boi.gov.il/press/eng/090803/090803f.htm .

[7] At end-July, FX reserves reached $52 billion; at end-2009, reserves were at $60.6 billion, albeit reflecting SDR allocation of $1.2 billion. The reserves coverage of imports rose from 4 ½ months to 12 months over this period.

the authorities view the shift to discretionary intervention as a transitional step back towards a free floating exchange rate regime, the IMF has since reclassified Israel's exchange rate regime from "free floating" to "floating."[8]

12.   **While not explicitly stated as an objective, the reserves accumulation strategy appears to have been also effective in stemming the rapid appreciation of the shekel.** Between December-2007 and July-2008, Israel's real effective exchange rate rose by close to 20 percent.[9] Over this short period, on a nominal basis, the shekel appreciated by about 25 percent against the US dollar and 12 percent against the euro. Since the intervention program was put in place, notwithstanding global developments, the shekel reversed course and, through end-2009, has depreciated by about 15 percent and 10 percent against the US dollar and euro, respectively.

Israel: Real Effective Exchange Rate, CPI-base (January 2006=100)
- REER
- Average
- +1 standard deviation
- -1 standard deviation

The Colombia Experience

13.   **The Colombia's Central Bank intervention strategy between 2004 and 2007 offers further insights on the need to time foreign exchange intervention correctly with the economic cycle.** In the context of an inflation-targeting and a flexible-exchange-rate regime, in 2004, the Banco de la Republica (BdR) of Colombia made use of both rule-based auctions of foreign currency swaps as well as direct and discretionary interventions in the spot market. This move was consistent with its foreign exchange strategy which aims, within a floating regime, at maintaining an adequate level of reserves, limiting excessive volatility at short horizons, and moderating excessive exchange rate movements that endanger the attainment of inflation targets and financial and external stability.

14.   **The intervention strategy aimed at addressing persistent and mounting peso appreciation.** Between end-2003 and end-2004, the Colombian peso appreciated by close to 20 percent against the US dollar, which led to expectations that inflation would fall well below its target coupled with adverse effects on external competitiveness.

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[8] The reclassification was triggered after three consecutive discretionary FX purchases.

[9] While at end-2007, IMF estimates pointed to shekel undervaluation, it was only in the order of about 5 percent (see IMF Country Report No. 08/63).

15.   **However, empirical evidence suggests that only the early intervention period was successful in stemming excessive currency appreciation.**[10] Initially, the intervention was based on pre-determined auctions, supported by policy rate reductions given that the economy was still operating below potential. However, as difficulties to contain the exchange rate appreciation in an overheating economy mounted, dollar purchases occurred in parallel with tightening monetary policy. As a result, by mid-2007, the BdR sent conflicting and ineffective signals to the markets by using the policy rate as instrument to target inflation, and foreign currency intervention to target the exchange rate.

16.   **Moreover, the pursuit of inconsistent policies and the commitment to the inflation target gave rise to the build-up of offsetting financial derivatives positions as investors started betting on a peso appreciation.** The one-sided, protracted discretionary intervention by the central bank exposed the peso to speculative appreciation pressures as a consequence of leveraged one-way bets in the derivatives market by investors expecting BdR to remain committed to its price-stability objective.

17.   **The Colombia experience exemplifies the need for a credible intervention strategy and the risks to financial stability arising from conflicting goals.** Sterilization of foreign reserve accumulation is unsustainable in the presence of rising output gaps. Therefore, the country cyclical position is a key consideration in any FX strategy to ensure stable inflation and avoid external imbalances.

Prudential Regulation

A strong macro-prudential framework can be a key element in the overall policy approach to capital inflows. The primary objective of macro-prudential policies is not to stem capital inflows or reduce upward pressure on the exchange rate per se. Instead, it is to protect the banking system from a reversal of boom-like macro-economic conditions that may be characterized by strong capital inflows, rapid credit growth and credit–fuelled bubbles in asset markets. Measures aimed at increasing the resilience of the banking system may indirectly discourage an overly rapid growth in credit and reduce the build-up of foreign exchange denominated exposures.

18.   **To be effective, a strong macro-prudential framework needs to combine a range of interlocking measures.** A prudential approach that focuses on a single measure, such as the Basel capital adequacy ratio, can encourage a build-up of risks that are inadequately captured, as banks increase those risks that are not monitored effectively and arbitrage existing prudential requirements. Indeed, cross-country evidence suggests that the introduction of prudential measures, sometimes supported by monetary measures, appears to

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[10] See Kamil (2008) and Chang (2008) for further details.

have contributed, on average, to some, at least temporary, containment of lending booms, especially when the prudential approach relied on a range of measures.[11]

19.   **The monitoring and control of liquidity risks needs to be a key element of the macro-prudential approach.** The global financial crisis has shown up inadequate control of liquidity risks that arise from an overreliance on short-term funding markets.[12] Such funding has typically been sourced in international wholesale markets and the embedded currency mismatches have further increased banks' vulnerability. In response, the Basel Committee issued a consultation paper that envisages an international requirement for banks to hold highly liquid assets against funding sources that are subject to roll-over risks. The paper also emphasizes the need to contain currency mismatches in banks' liquidity positions.[13]

20.   **A macro-prudential approach requires the build-up of buffers in good times that can be drawn upon in bad times.** The framework likely to be adopted in the EU combines dynamic provisioning and time-varying capital buffers.[14] A dynamic provisioning framework, such as the one operated in Spain since 2000, requires banks to set aside general provisions against loan losses that are expected to occur over a full economic cycle. When the credit cycle turns and loan losses are realized, the general provisions are released and replaced by specific provision for losses incurred, avoiding the cyclicality in provisions that may otherwise undermine capital positions in recessions. In addition, the authorities can take measures to promote the build-up of capital buffers in good times that can be drawn upon in periods of stress. Such a countercyclical capital framework contributes to a more stable banking system, by smoothing the impact of economic and financial shocks arising from volatility in capital flows. Central bank imposed controls on the growth of credit, such as used in Croatia from 2007, are an alternative that could also be considered (discussed below).

21.   **Measures directed at banks' balance sheets are usefully complemented by close supervision of lending standards.** Poland, for example, recently adopted new regulations, known as Recommendation T, intended to enhance banks' appraisal of credit risks for consumer loans, including through the introduction of maximum loan-to-income (LTI) and loan-to value (LTV) ratios.

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[11] See Borio and Shim (2007).

[12] Empirical evidence confirms that a high share of wholesale funding has been a key predictor of bank failures during the global financial crisis. See Ratnovski and Huang (2009).

[13] See http://www.bis.org/publ/bcbs165.htm .

[14] The European Commission has in 2009 started a consultation with a view to adopt dynamic provisioning across the EU. Separately, the Basel Committee is currently consulting on a set of reform proposals to strengthen the resilience of the banking system, including countercyclical capital buffers, http://www.bis.org/publ/bcbs164.htm .

22.   **The risk of a build-up of foreign exchange denominated exposures requires special attention.** Across central and eastern Europe (CEE), since the late 1990s a rising share of household loans, mortgages in particular, was denominated in foreign currency, especially euro and swiss franc.[15] In the process, households took on substantial unhedged foreign exchange (FX) liabilities, creating balance sheet vulnerabilities and significantly complicating policy responses across the region. In countries with flexible exchange rates, the depreciation of local currencies in late 2008 and early 2009 led to increases in debt servicing costs, depressing disposable income and consumption. In countries with fixed exchange rates, devaluation was feared to unduly stress household balance sheets, even though it was felt that this could have helped restore competitiveness.

23.   **Foreign-exchange denominated exposures may also create significant vulnerabilities for the banking sector.** A depreciation of the local currency can lead to a reduced ability of households to repay their loan, implying a higher probability of default (PD). When the collateral backing the loan (e.g. a local house) is priced in local currency, depreciation also leads to an erosion of collateral value relative to the loan amount and increases the loss given default (LGD). [16] Depreciation finally leads to an expansion of (risk-weighted) assets when loan amounts are converted into local currency on banks' balance sheets. Since the offsetting unrealized capital gain is not usually allowed to count towards regulatory capital, this puts pressure on capital ratios and can lead to a capital crunch.

24.   **Further vulnerabilities can arise depending on the way foreign exchange denominated exposures are funded and hedged.** Short-term foreign funding may be subject to sudden reversals, exposing banks to roll-over risks. Such funding can also lead to a squeeze of net interest income, when margins over variable rates are fixed under the long-term mortgage contract, but vary on interest paid depending on market conditions. Experience across the region has shown that when funding is raised domestically, but hedged through short-term currency swaps this can likewise create important vulnerabilities. Depreciation increases the cost of rolling over the hedge. Moreover, in stressed conditions, banks may be unable to roll over the hedge in private markets, forcing recourse to central bank provided currency swaps. Box 1 provides more detail on vulnerabilities arising on the funding side.

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[15] While these loans are *denominated* in foreign currency, they are often *settled* in domestic currency. In the case of an FX mortgage denominated in swiss francs or yen, for example, the borrower receives local currency—equivalent to the contracted FX loan amount— and uses local currency to purchase a local home. Interest payments and repayment of the principal are also settled in local currency, at the prevailing exchange rate. However, in some countries in the region, such as Romania and Bulgaria, a high degree of "euroization" allows both the purchase of residential real estate and euro-denominated loans to be settled in euros,

[16] This effect may be absent in countries where residential real estate is quoted in euros, rather than local currency.

25.   **A range of prudential measures can be taken to address the risks arising from foreign exchange denominated mortgages.** In a number of countries, Poland included, prudent loan–to-value (LTV) ratios have helped limit household sector vulnerabilities from foreign exchange denominated mortgages. In addition, the liquidity framework can be enhanced by prescribing that long-term foreign exchange denominated exposures are funded and hedged on a long term basis. Finally, capital requirements can be raised to reflect increased credit and valuation risks associated with FX exposures. Such measures can increase the resilience of the banking sector but will also raise the cost of offering foreign exchange denominated mortgages, potentially cooling capital inflows associated with funding these exposures. However, increased capital requirements can be more effective if this measure is coordinated with the home country supervisors of parent banks, since there is a risk otherwise that foreign exchange denominated mortgages are provided directly by parent institutions.[17]

26.   **Ultimately, an effective macro-prudential framework needs be based on close cooperation between national authorities and can be strengthened by multilateral action**. Cooperation between the central bank and the supervisory authority needs to extend both to the analysis of threats to financial stability arising from inflows and the coordination and timing of new measures. Attention needs to be given to avoid pro-cyclicality and excessive rigidity in the system, with adverse effects on the health of the banking system and access to credit on the part of households and enterprises. Moreover, the crisis has shown that national approaches to mitigate cross-border flows face important limitations. The approach to capital inflows in the EU is likely therefore to benefit from multilateral action that could be taken under the auspices of the new European authorities, such as the European Banking Authority (EBA) and European Systemic Risk Board (ESRB).

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[17] A recent proposal by the European Commission envisages higher capital requirements for foreign currency mortgages across the European Union.

Box 1: Funding Foreign Exchange Denominated Mortgages: Risks and Flows

Over and above the vulnerabilities arising on the asset side of banks' balance sheet, additional vulnerabilities can arise from the way banks fund FX loans. When the loan is funded long-term in foreign currency, e.g. through a long-term FX bond, this creates a foreign capital inflow which tends to create upward pressure on the local currency. However, the flow is not vulnerable to a sudden reversal that could put pressure on the banking system.

When the loan is funded short-term in foreign currency, e.g. through FX deposits, sourced in wholesale markets, or—more often—from a foreign parent bank, there is again a capital inflow and an effect on the exchange rate when the funding is first initiated. In addition, the capital inflow is vulnerable to a sudden reversal, creating an acute risk for the banking system if banks are unable to roll-over their short-term foreign funding.

Under a third common funding model, the loan is funded short-term in domestic currency, but the foreign exchange risk inherent in such funding is hedged through a short term swap.[1] The swap does not create a net capital inflow in itself.[2] However, since the domestic bank will sell the foreign currency received under the swap contract in the spot market, in order to create a net short FX position, a capital inflow and upward pressure on the exchange rate still arise.

- This funding model also creates vulnerabilities that relate to the local bank's ability to roll-over the hedge. A shortage of foreign currency in international markets (as observed for dollars, euros and swiss francs during the crisis) and increased perceptions of counterparty credit risk may increase the cost of rolling over the hedge. Indeed, the experience during the crisis has been that private swap markets broke down from 2008Q4 across the region, forcing recourse to central bank provided currency swaps.[3]

- Even when private swap markets remain open, a depreciation of the local currency will tend to lead to margin calls and increase the cost of rolling over the hedge in local currency terms. This may in turn create a liquidity squeeze in local interbank markets.

1/ Under the swap agreement, the local bank pays out local currency and receives a claim on the foreign bank to pay back local currency at maturity. The foreign bank pays out foreign currency and has a claim on the domestic bank to pay back foreign currency at maturity. This means that at maturity the local bank owes FX, while the foreign bank owes local currency. The amounts owed at maturity are fixed in advance and do not depend on the exchange rate prevailing at maturity. However, when the bank needs to roll-over the hedge, the terms of the new swap will depend on the prevailing exchange rate.

2/ The swap creates both a domestic claim on a foreign bank and a foreign claim on the domestic bank. Both claims are recorded in the capital account but net out. In addition, any margin payments—that reflect interest differentials— are recorded in the current account, but would tend to small.

3/ The inability to roll-over the hedge would otherwise have led to substantial open FX positions, sharply increasing capital requirements for local banks. More importantly, when banks are unable to roll-over their swaps, they must obtain fx in the spot market in order to redeem their FX obligation under the swap, leading to an accelerating depreciation of the local currency.

Capital Controls

Capital controls may help counter strong temporary surges in capital inflows and reduce pressure on the exchange rate. They can also alter the composition of flows and reduce macro-financial vulnerabilities associated with rapid inflows. Capital controls can be administered by the government (often the fiscal authorities) or the central bank. Both unremunerated reserve requirements (URRs) and taxes on capital inflows have been used widely in the past, especially in emerging markets. However, they impose an administrative burden and can be circumvented.

27.   **The use of unremunerated reserve requirements and taxes on capital inflows both reduce the attractiveness of inflows, but work in different ways**.

- **URRs**—which entail a mandatory deposit of a portion of short-term foreign currency debt for a specific period without remuneration—involve a relatively straightforward change in the central bank's operational framework, typically augmenting pre-existing reserves requirements imposed on the domestic banking system. While the evidence on the effect of URRs on the volume of inflows is mixed they have proved effective in protecting the banking system by altering the composition of inflows towards longer maturity, notably in the cases of Columbia, Chile and Croatia. The case of Croatia is a good example of how the monetary measures can be effective, especially when they are combined with a range of prudential measures (Box 2). However, URRs imposed on domestic banks can push business offshore or into the non-bank financial sector. They also impose an administrative burden on the banking system, which increases with repeated changes in coverage and terms. Their design is constrained by the EU Treaty and other regulations and must not involve discrimination between foreign and domestic providers of funds.

- **A tax on inflows** aims at discouraging the targeted financial transactions by reducing the rate of return to non-resident investors on domestic assets. The recent case of Brazil has highlighted the limited impact of these measures if applied to specific transactions. While a broad tax on capital inflows can help avoid tax evasion and possibly have countercyclical effects in terms of revenues, there are high costs associated with building the administrative capacity required to impose a broad-based tax, and even where the necessary apparatus already exists, enforcement and collection issues can be a constraint. Taxes that discriminate between foreign and domestic residents within the EU are in any case likely to be inconsistent with the EU Treaty (Box 3).

Box 2: The Experience of Croatia[18]

From 2004 the Croatian National Bank (CNB) took a number of steps to reduce macro-financial vulnerabilities associated with strong capital inflows and rapid credit growth. These included a marginal reserves requirement (MRR) on foreign borrowing (from 2004), which was combined with direct measures to control the growth of credit (2003 and 2007) and a number of prudential requirements. Together, these measures were successful in slowing the growth of bank credit and increasing banks' awareness of risks, especially regarding FX lending. They also altered the composition of banks' funding. In response to the measures, foreign borrowing declined and banks intensified their efforts to attract domestic deposits to fund their activities. Capital adequacy also increased, in part because foreign-owned banks have found it cheaper to raise capital from their parents rather than rely on foreign borrowing subject to CNB measures.

At the same time, the measures had some undesirable implications. Most obviously, the measures tend to raise spreads and may have reduced access to credit for small and medium-sized enterprises. Moreover, in the presence of effective credit limits, foreign banks helped arrange direct cross-border borrowing for their clients, typically for the most creditworthy large corporates, leaving the Croatian banks mostly with customers with no other sources of financing. In addition, regulatory arbitrage led to unwelcome developments in the non-bank financial sector, with leasing companies extending credit. Finally, the measures had administrative costs for banks and the CNB, as attempts to circumvent the regulations prompted successive adjustments in their scope.

Measures to Address Credit Growth

Monetary Measures
- Marginal reserve requirement (MRR) on banks' new foreign borrowing: introduced in mid-2004 at a rate of 24 percent, subsequently increased in steps to 55 percent; loopholes in the base closed.
- Special reserve requirement, SRR (2006): set at 55 percent on banks' liabilities arising from issued securities to close a loophole for the MRR. The reserve base is any increase in the balance of issued securities in a specific period of time compared with the average balance of the issued securities in January 2006.
- Credit controls were reintroduced in 2007; (last applied in 2003); banks were required to purchase low-yielding CNB bills for 50 percent of the amount by which their credit growth exceeded a ceiling, which is consistent with 12 percent credit growth for the full year ("12 percent rule"). Since their introduction, the CNB modified controls several times, tightening conditions, closing loopholes and introducing monthly sublimits.

Prudential Measures
- Foreign-currency liquid asset requirement (the "32 percent rule") (2003) (the base was broadened in late 2006 to include indexed instruments).
- Requirement to set aside provisions for general banking risks for banks with asset growth above specific threshold (2004, modified in 2006)
- Increased risk weights on unhedged FX loans (2006, raised further in late 2007);
- Issuance of guidelines for banks on managing risks of FX/ household loans (2006).
- Minimum required capital linked to credit growth and funding sources (2007)
- Cross-border supervisory coordination intensified.

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[18] See Republic of Croatia: Financial Stability Assessment - Update, IMF, Washington D.C., 2008.

Box 3: EU and OECD Regulation on Capital Controls

EU: Article 56(1) of the EU Treaty prohibits capital controls, stating that "all restrictions on the movement of capital between Member States and between Member States and third countries shall be prohibited." Nevertheless, the prohibition needs to remain consistent with the member's right "to take all requisite measures to prevent infringements of national laws and regulations, in particular in the field of taxation and the prudential supervision of financial institutions, or to lay down procedures for the declaration of capital movements for purposes of administrative or statistical information, or to take measures which are justified on grounds of public policy or public security" (Article 58(1)). Although this leaves a certain margin of discretion, the Treaty clarifies that the above measures and procedures cannot constitute "a means of arbitrary discrimination or a disguised restriction on the free movement of capital and payments" (Article 58(3)). Ultimately, the Court of Justice of the European Communities is responsible for judging which measures are compatible with the rules of the Treaty.

OECD: The OECD Code of Liberalization of Capital Movements and Code of Liberalization of Current Invisible Operations prescribes to its members the full liberalization of all current and capital transactions and the related payments and transfers. Temporary reservations to liberalize specific transactions are accepted to allow the needed sequencing. However, new restrictions—defined as any discrimination in transactions between residents and non-residents—can be introduced only under specific conditions (that is if (i) free capital flows have resulted in serious economic and financial disturbances or (ii) in the case of serious balance of payments difficulties for a limited time) or if the latter does not apply for specific transactions (mainly short-term and real estate-related).

WTO: As the EU has accepted specific WTO commitments concerning trade in banking services, General Agreement on Trade in Services (GATS) provisions introduce WTO jurisdiction over the capital flows associated with these banking services. While there is exclusion for prudential measures, capital controls are subject to a WTO dispute panel.

D. What Are the Lessons for Poland?

28. **Poland's Central Bank Act stipulates that its key objective is to maintain price stability.** However, while the National Bank of Poland's (NBP) mandate focuses on the inflation target, it allows for the use of multiple instruments to achieve it. For example, the mandate considers foreign exchange intervention as an appropriate monetary policy instrument. Specifically, in the event that exchange rate fluctuations exert a considerable impact on macroeconomic and financial stability, which in turn endangers the attainment of the inflation target, the NBP has in its discretion to intervene directly in the foreign-exchange market.[19]

29. **Intervention in the form of FX reserves management can provide a line of defense to a potential resurgence in capital inflows**. As highlighted by the recent Israeli experience, a systematic and transparent foreign exchange strategy can smooth excessive exchange rate appreciation and enable the build-up of reserves, while remaining consistent with the inflation targeting objective. However, the correct timing of the intervention policy, consistent with the economic cycle, is essential to achieve these objectives. For Poland, the strategy seems justified by the state of the cycle, with the economy not expected to reach potential until 2011 and a stable inflationary environment (Figure 2). Additionally, a case for building up reserves for precautionary purposes can also be made. For example, measured against standard reserves adequacy metrics, Poland's reserves coverage, while improving, remains relatively low (Figure 3). In particular, in order to satisfy an adequacy rule ala Guidotti-Greenspan—that is, 100 percent coverage of gross financing requirements (short-term debt at remaining maturity plus the current account balance)—the authorities would need to target $20-25 billion in additional FX reserves, albeit access to the IMF's Flexible Credit Line provides another potential source of FX liquidity to meet this target level or possible tail risks.

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[19] See National Bank of Poland - Monetary Policy Council - Monetary Policy Guidelines for 2010:
http://www.nbp.pl/homen.aspx?f=/en/publikacje/o_polityce_pienieznej/zalozenia.html.

Figure 2. Poland's Cyclical Position, 2004Q1-2009Q4

Poland: Output Gap and Current Account Deficit

Output gap
CAD/GDP
(percent, rhs)

Headline Inflation
(Y-o-y percent change, end-of-period)
Projections starting in May 2009
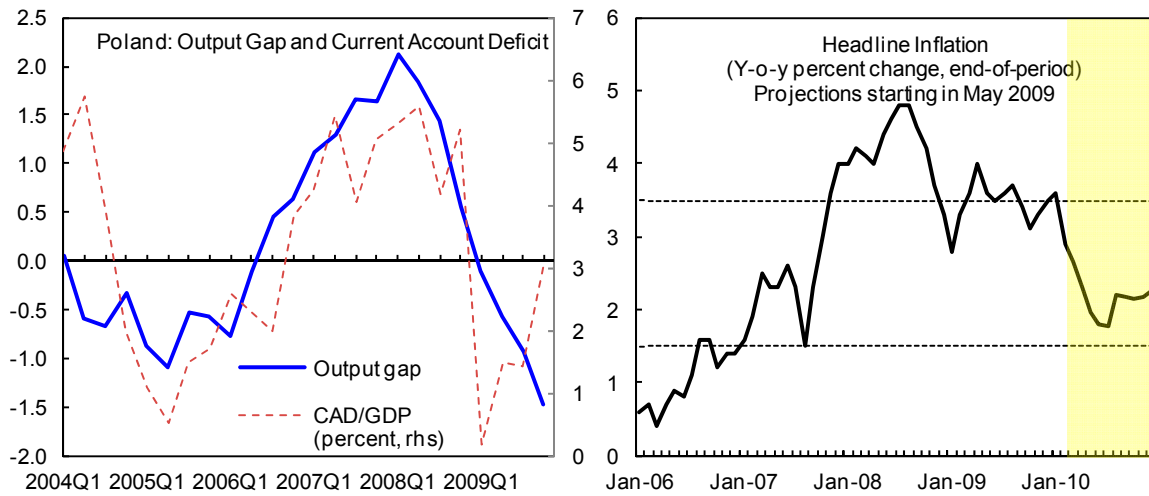
Figure 3. Poland: REER and Reserves Position, 2000-09

Poland: Real Effective Exchange Rate

REER
Average
+1 standard deviations
-1 standard deviations

Gross International Reserves in Emerging Markets
(Percent)

End-2009 GIR in percent of broad money

End-2009 GIR in percent of 2010 current account deficit and 2010 short-term debt at remaining maturity
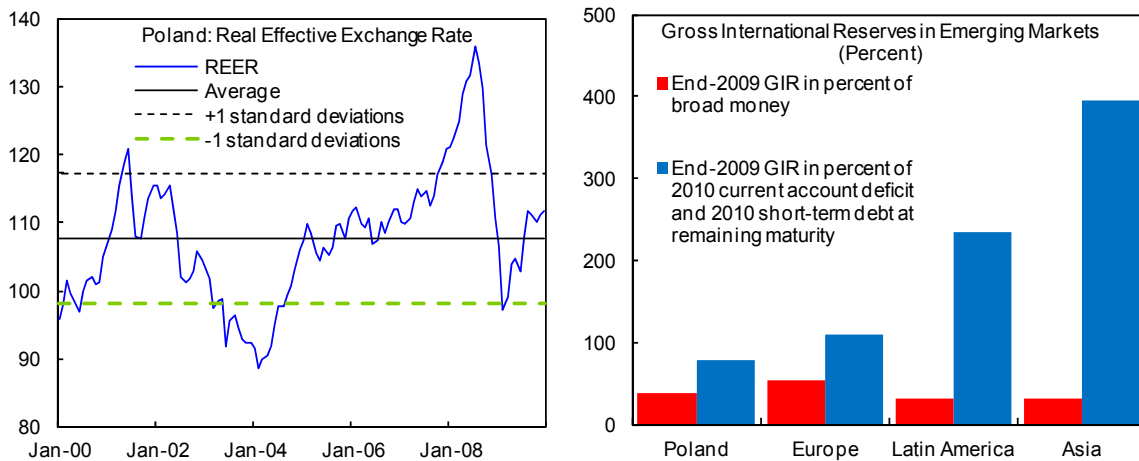
30.   **However, a reserves accumulation strategy would ultimately represent a short-term solution.** While intervention when output is still below potential tends to be consistent with the inflation target objective, its effectiveness is hampered once the macroeconomic cycle calls for tightening of monetary policy. In this case, intervention cannot help deal with the inflationary impact of capital inflows as higher interest rates would only trigger further inflows, potentially leading to a vicious cycle.

31.   **A strong macro-prudential framework can also help stem flows while strengthening the financial sector.** The Polish financial authorities have already put in place a set of regulatory and supervisory measures that helped mitigate a surge in financial sector flows seen elsewhere in the region during the boom period. The 2006 introduction of Recommendation S by NBP's Banking Supervision has helped strengthen risk management

in the mortgage sector and limit household sector vulnerabilities from foreign currency mortgages.[20] Furthermore, the authorities recently approved Recommendation T that aims to strengthen what were perceived to be uneven lending standards for consumer loans, including through the introduction of new maximum debt to income ratios. To further strengthen the macro-prudential approach, the authorities may consider introducing countercyclical capital buffers and provisions and reviewing the strength of existing liquidity standards in light of international proposals.

32.   **Specific vulnerabilities created by FX mortgages call for further targeted intervention.** A first useful step is the development of a liquidity regime that ensures that FX mortgages are funded and hedged on a long-term basis. In addition, increased risk weights on foreign currency exposures could be introduced to reflect greater credit and valuation risks associated with these exposures. Such measures may also increase the costs to banks of offering foreign currency denominated mortgages and cool capital inflows associated with funding FX exposures. However, these measures can be more effective if implemented in cooperation with the home authorities of parent banks. Otherwise, there is a risk that FX mortgages will be provided by parent institutions, sidestepping local regulations.

33.   **Monetary controls on capital inflows could also be considered in case of rising pressures.** Even when their effect on the volume of flows is limited, monetary controls can help increase buffers and improve the resilience of the financial system to volatile capital flows. Croatia's relatively successful experience with URRs on banks' new foreign borrowing had resulted in temporary reduction in such borrowing. This example also shows that monetary controls work best when supported by a range of prudential measures. However, due attention needs to be given to the risk of discouraging financial intermediation and shifting activity offshore to circumvent domestic regulations. Moreover, in the case of Poland, the design of URRs would be constrained by the EU Treaty and OECD regulations.

E. Conclusion

34.   **As capital inflows return to Poland, policy makers should not underestimate the potential need to stem excessive inflows**. Poland managed to largely escape the most recent boom-bust episode and, in the early quarters of the global recovery, Poland has outpaced the region in renewed capital inflows. As investors become increasingly more differentiating, Poland is likely to remain a key recipient of capital reflows to Emerging Europe and could see sustained upward pressure on its exchange rate in the years ahead.

35.   **While the flexible exchange-rate policy remains the main defense against a sustained surge in capital inflows, there is scope for additional policy tools.** In order to

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[20] Following the merger of banking supervision into the Polish FSA (KNF), an enhanced Recommendation S (II) was introduced in 2008.

avoid the prospect of an overshoot and sharp reversal, an effective policy response may require early intervention in the foreign exchange market and/or enhanced macro-prudential measures. Indeed, under certain conditions, the NBP could consider temporarily undertaking limited foreign-exchange intervention. Such intervention should be transparent and well-communicated, particularly if implemented along the lines of the recent Israeli experience, so as not to compromise the integrity of the inflation-targeting framework. Moreover, careful application of a strong macro-prudential framework can also help stem flows while strengthening the financial sector. Finally, limitations on foreign-currency lending recommended for prudential reasons could have the added benefit of slowing the resurgence in capital inflows.

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**CHAPTER II. A LEAP BEYOND TRADITIONAL FISCAL INDICATORS: MEASURING POLAND'S
INTERTEMPORAL NET WORTH AND DERIVING ITS POLICY IMPLICATIONS[1]**

A. Introduction

1.   **Traditional fiscal indicators focused on the level of deficit and debt show that
Poland's fiscal position has worsened considerably.** The decline in Polish economic
activity due to the 2008–09 global economic crisis led to a fall in fiscal revenues—the so-
called automatically stabilizing response of the fiscal accounts to the cycle—albeit this was
less severe than elsewhere, given that Poland was the only country in Europe to have avoided
a recession in 2009. In addition, discretionary measures adopted before the crisis that
lowered personal income taxes and social security contribution rates came into effect just as
the crisis hit: an ex-ante unanticipated yet ex-post well timed fiscal stimulus. As a result, the
overall fiscal deficit increased to above 7 percent of GDP and gross public debt to about
50 percent of GDP in 2009, placing Poland around the EU27 average on both measures
(Figure 1).

2.   **More complex, forward-looking measures also imply a deterioration in Poland's
long-run fiscal position, though it remains relatively better compared to peers.**
Traditional indicators only capture the effects of past and current policies and events on
countries' current fiscal positions. But more comprehensive indicators of fiscal sustainability,
including those developed by the European Commission, try to encompass both the initial
fiscal position and a measure of future prospects under current policies, notably including the
potential effects of population aging. These indicators measure the required upfront fiscal
adjustment needed to either maintain debt at the Maastricht level after 2060 (the S1 indicator)
or to satisfy the government's intertemporal budget constraint over an infinite horizon (the
S2 indicator).[2] According to the EC's latest Sustainability Report, Poland's long-run fiscal
position has deteriorated since 2006, with both measures showing the need for an upfront
adjustment of some 3 percent of GDP to maintain sustainability in 2009, compared to no
adjustment required three years ago. This is due to both a deterioration in Poland's headline
deficit and revisions to its estimated aging costs. Nevertheless, Poland continues to rank
relatively favorably in a cross-country context, due to pension reforms adopted in the 1990s
that substantially lowered its aging costs (Figure 2).

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[1] Prepared by Delia Velculescu.

[2] The intertemporal budget constraint tests the ability of the government to generate enough primary surpluses
into the future to meet its current net debt obligations.

Figure1. Poland: Traditional Fiscal Indicators in a Cross-Country Perspective, 2009
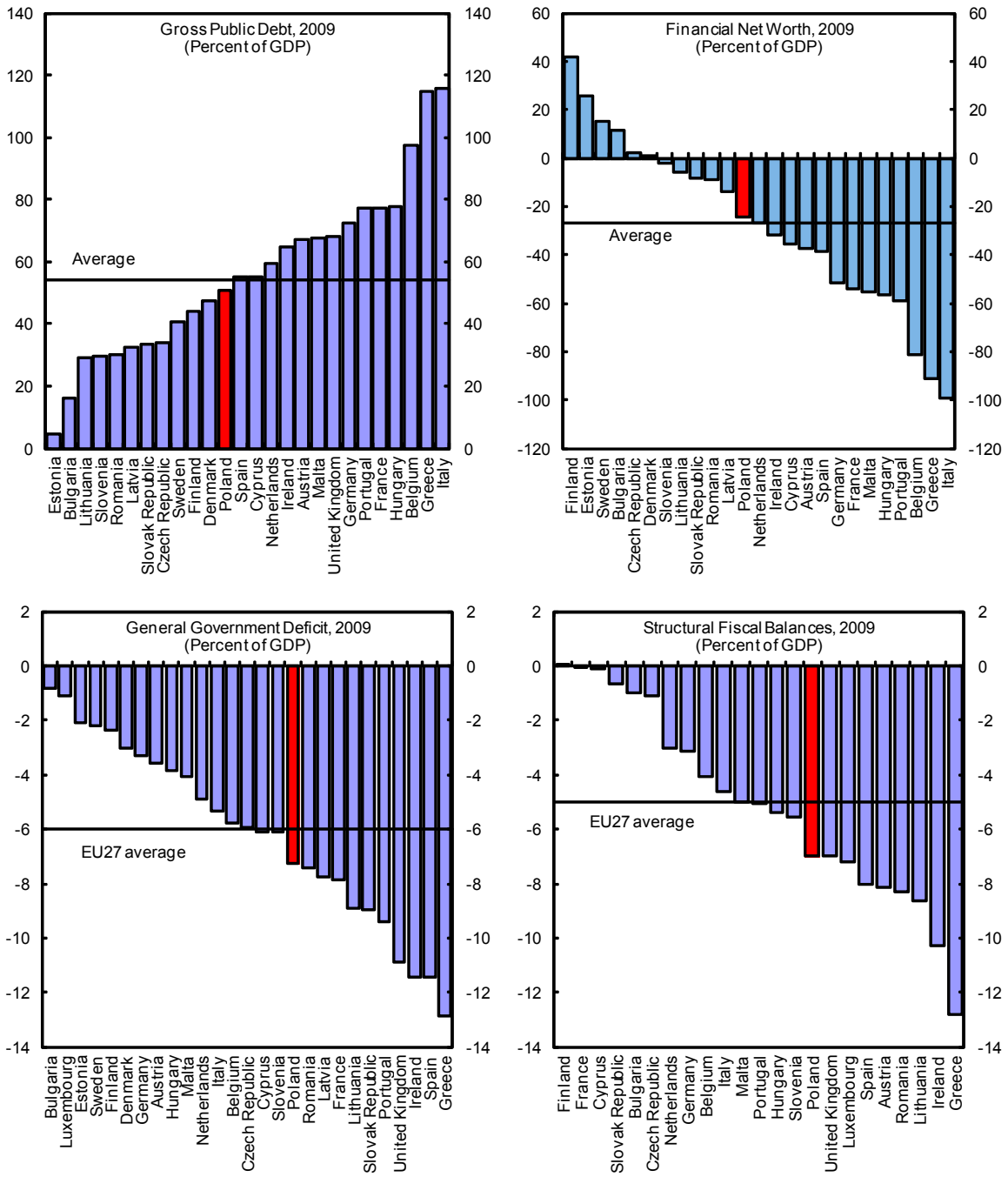
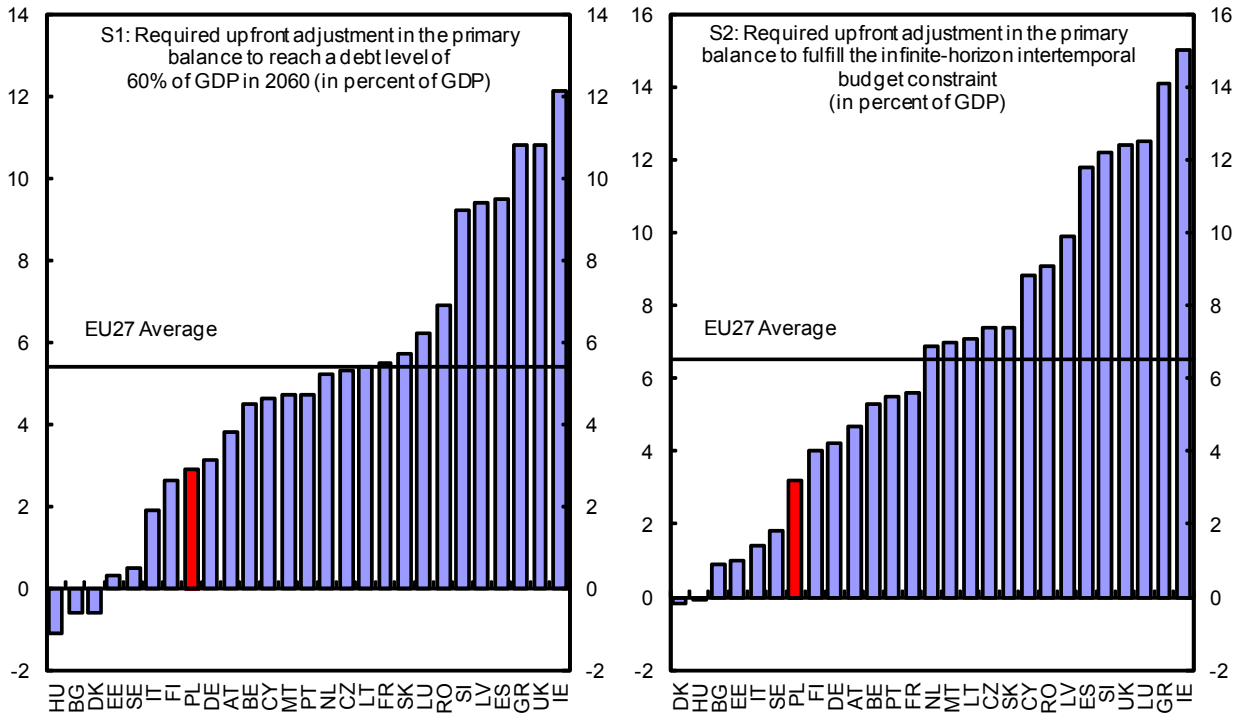Source: IMF, *World Economic Outlook*.

Figure 2. Poland: European Commission Long-Term Indicators

S1: Required upfront adjustment in the primary balance to reach a debt level of 60% of GDP in 2060 (in percent of GDP)

EU27 Average

S2: Required upfront adjustment in the primary balance to fulfill the infinite-horizon intertemporal budget constraint (in percent of GDP)

EU27 Average

	Structural primary balance		Change in age-related	S1				S2		
	2008	2009	expenditure	Total S1	IBP*	DR*	LTC*	Total S2	IBP*	LTC*
BE	1.5	0.7	5.9	4.5	0.5	0.6	3.5	5.3	0.6	4.8
BG	1	1.1	3.2	-0.6	-0.7	-0.5	0.6	0.9	-0.6	1.5
CZ	-2.3	-2.9	6.3	5.3	3.6	-0.3	1.9	7.4	3.7	3.7
DK	5.6	2.8	1	-0.6	-1.9	-0.5	1.8	-0.2	-1.6	1.4
DE	1.6	0.6	5.1	3.1	0.8	0.2	2.1	4.2	0.9	3.3
EE	-3.9	-0.6	-0.1	0.3	1	-0.6	-0.2	1	1.1	-0.1
IE	-6.4	-7.6	8.7	12.1	8.2	0.2	3.7	15	8.3	6.7
GR	-2.1	-0.9	16	10.8	2.4	0.7	7.7	14.1	2.6	11.5
ES	-2.4	-5.2	8	9.5	5.9	-0.1	3.6	11.8	6.1	5.7
FR	-1.5	-2.7	2.1	5.5	3.8	0.4	1.4	5.6	3.8	1.8
IT	1.7	2	1.6	1.9	-0.2	0.7	1.4	1.4	-0.1	1.5
CY	2.9	0.2	10.7	4.6	0.2	-0.3	4.7	8.8	0.5	8.3
LV	-4.9	-8.1	1.3	9.4	8.8	-0.2	0.9	9.9	8.9	1
LT	-4.5	-3.1	6	5.4	3.7	-0.3	2	7.1	3.9	3.2
LU	2.3	1.2	16.2	6.2	-0.6	-0.8	7.5	12.5	-0.4	12.9
HU	-0.3	3.1	3.3	-1.1	-1.9	0.4	0.4	-0.1	-1.6	1.5
MT	-1.6	-0.2	9.2	4.7	1.1	0.2	3.4	7	1.4	5.7
NL	1.7	0	6.7	5.2	1.6	0	3.7	6.9	1.9	5
AT	0.8	-0.2	4	3.8	1.5	0.2	2.2	4.7	1.6	3.1
PL	-3.1	-3.1	-1.2	2.9	4.2	0	-1.2	3.2	4.4	-1.2
PT	-0.9	-2.4	2.8	4.7	3.4	0.3	1	5.5	3.7	1.9
RO	-7.2	-3.7	8.5	6.9	4.1	-0.4	3.2	9.1	4.3	4.9
SI	-1.3	-3.3	12.5	9.2	3.8	-0.3	5.7	12.2	3.9	8.3
SK	-3.5	-3.7	5.5	5.7	4.3	-0.3	1.6	7.4	4.5	2.9
FI	4.3	2.1	5.4	2.6	-0.8	-0.3	3.7	4	-0.5	4.5
SE	3.4	0.9	2.4	0.5	-0.1	-0.3	0.8	1.8	0.2	1.6
UK	-3.3	-7.8	4.8	10.8	8.6	0.2	2	12.4	8.8	3.6
EU27	-0.4	-2	4.4	5.4	3.1	0.2	2	6.5	3.3	3.2

Table title: Sustainability gaps (in percent of GDP)

* IBP = required adjustment given the initial budgetary position, DR = adjustment to reach the debt requirement (60% of GDP) in 2060, LTC = required adjustment given the long-term change in the primarhy balance due to demographic ageing.
Source: European Commission, Sustainability Report 2009

3.   **Under existing national and international frameworks, fiscal assessments and policy-making decisions remain governed by traditional indicators.** Given that these indicators are easy to measure and explain to the public, they constitute the basis of the European Union's fiscal coordination mechanisms under the Stability and Growth Pact (SGP). Under the pact, countries whose deficits and debts have deteriorated recently—Poland included—are required to undertake a relatively larger fiscal effort to return their deficits to the 3 percent of GDP limit (as required under the Excessive Deficit Procedure) relative to countries with lower current deficits and gross debts—which are seen as having more "fiscal space." Similarly, national policies generally target short-run indicators, such as the level of the deficit, structural deficit, or debt. In Poland, policies need to adjust when debt reaches 50 and 55 percent of GDP, and the Constitution establishes a 60-percent-of-GDP ceiling for national debt.

4.   **But the emphasis on short-run indicators can distort policies, especially at times of crisis.** It has been documented that, in downturns, countries resort more frequently to short-run temporary solutions to lower their deficits. Sometimes, these measures include creative accounting and may even worsen their long-run fiscal positions.[3] This could be exemplified by a recent trend seen in some Eastern European Countries (EECs) that are now partially back-tracking on their pension reforms by lowering or suspending the fiscal contributions to private pension systems in order to reduce their short-run deficits.[4] These actions are the result of a perception of being effectively "punished" in an international context for having undertaken pension reforms, because such reforms temporarily increase short-run deficits and debt—in principal working against the SGP criteria, which apply uniformly to both reformers and non-reformers. Clearly, such tensions between the traditional and more forward-looking indicators are now surfacing within national policies in a number of countries, Poland included, with potentially negative long-run consequences for policy making.

5.   **Hence, an increasing awareness is slowly emerging to integrate more fully the essential long-run considerations into policy making, including through new analytical tools.** The development and publication of the European Commission's forward-looking indicators is a step in this direction.[5] Nevertheless, these measures remain only indicative, are relatively little known by the general public and market participants, and do not carry the same political weight as traditional indicators, perhaps because of their complexity and difficulty to explain to voters. A new tool—the comprehensive public sector balance sheet—

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[3] See Milesi-Ferretti and Moriyama (2004) and von Hagen, and Wolff (2006) on theoretical and empirical analyses of creative accounting, including some applications to the European Union.

[4] Estonia, Lithuania, Latvia, Slovakia, and Romania have already undertaken measures to this effect. Croatia and Poland have been contemplating similar measures.

[5] Other examples include Ceccheti et. al. (2010) and Gokhale (2009).

has been developed at the IMF, which mirrors the EC's forward-looking indicators, but uses a framework that is somewhat more intuitive and could be easier to present to the public.[6] As such, it may constitute a more practical framework for policy makers to integrate forward-looking considerations into their analyses and ultimate decisions.

6.   **The present paper applies the comprehensive balance sheet framework to the case of Poland to assess the public sector's intertemporal net worth and provide policy recommendations.** Poland lends itself naturally to this type of analysis, given that it is one of the countries where there is a tension between short-run and long-run indicators. Section II describes the analytical framework stressing its advantages, and outlines how it is constructed. Section III applies the tool to Poland and presents some measures of its intertemporal net worth. Section IV concludes with some policy recommendations.

B.   What is the Public Sector's Comprehensive Balance Sheet?

7.   **The public sector comprehensive balance sheet is a thermometer of fiscal health that measures the consequences of current policies on the fiscal accounts both at present and in the future.** It is tool that can be thought of as the mirror image of the Aging-Working Group sustainability indicators. Rather than measuring the upfront primary balance effort required to satisfy a given intertemporal budget or explicit debt constraint (as the EC's S1 and S2 indicators do), it provides a direct snapshot of a government's net worth at a given point in time, under current policies. It does so by complementing the backward-looking traditional "accounting balance sheet" of a government with the effects of current fiscal policies on future assets and liabilities, thus becoming also forward looking. This measure can therefore gauge whether the government's long-run intertemporal budget constraint is satisfied or not under current policies.[7]

8.   **It can provide early warning signs of fiscal (un)sustainability.** In Poland's case, traditional indicators such as short-run deficits and debt are larger than they would otherwise be, as a result of transition costs due to the 1990s pension reforms. The comprehensive public sector balance sheet would correctly capture both the short- and the long-run consequences of such reforms. However, if the resulting intertemporal net worth is negative—even after accounting for the long-run effects of pension reforms—this would signal the need to strengthen policies and bring total assets in line with total intertemporal liabilities, lest market forces eventually emerge to restore equilibrium. Since fiscal adjustment is often difficult and requires time for consultation with the public, there is value in having advanced information on prospective fiscal (in) consistency, which is why this tool can be seen as an early warning system.

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[6] See Traa and Velculescu (forthcoming), and Traa (2009).

[7] It, however, does not include liabilities of the financial system (as contingent-claims-analysis models do), nor liabilities resulting from environmental factors.

9.   **It can also help to communicate policy needs in an intuitive way that is easier to grasp by the general public.** The literature offers a variety of sophisticated models, such as overlapping-generation, computable dynamic general-equilibrium, and contingent-claims models, to analyze the long-run effects of fiscal policies and risks. However, these tend to have only a limited impact beyond the academic circles, perhaps because they are complex. Even the EC's Aging-Working Group indicators reach a relatively limited audience partly due to the difficulty of relaying their message to the median voter. In contrast, the intertemporal net worth is a somewhat more straight-forward and intuitive concept, as more people understand the meaning of a balance sheet and of financial net worth. Consequently, it may be easier to use as a communication device with the public about the need to strengthen policies.

10.   **Constructing the comprehensive balance sheet requires two steps.** First, it entails the building of a traditional backward-looking accounting balance, computed as the difference between a country's fiscal assets and liabilities. Second, the traditional balance sheet needs to be augmented with the projected outcomes of policies in the future. The latter step requires a baseline macroeconomic and fiscal scenario asking the question: *with current structural and fiscal policies, how many more assets and liabilities will the government likely generate in the future?* The yearly projections of the future path of fiscal deficits net of interest payments, based on estimates from current policies, are then discounted and added up into a net present value measure. This measure is added to the current net worth to derive the intertemporal net worth. The next section exemplifies these steps for Poland.

C. Deriving Poland's Intertemporal Net Worth

11.   **In a first step, Poland's traditional public sector balance sheet is constructed, which shows a negative net worth of about 20 percent of GDP at end-2008.** Financial liabilities, mainly comprised of public debt and other liabilities amounted to 54 percent of GDP at end-2008. At the same time, Poland's financial assets, including shares, currency and deposits, and other assets, were estimated at about 34 percent of GDP at end-2008. Consequently, net financial worth—assets minus liabilities—equals about 20 percent of GDP (Table 1). A more comprehensive measure of current net worth would also include the public sector's net capital stock—the sum of all buildings, highways, infrastructure, and land acquired by the state over the years. However, in the absence of data on this stock, only financial assets and liabilities are considered here, with financial net worth thus likely to underestimate Poland's total net worth.

Table 1. Poland: Traditional Public Sector Balance Sheet, 2003-08
(in percent of GDP)

	2003	2004	2005	2006	2007	2008
Financial assets	32.7	33.8	31.2	32.7	34.8	33.7
Currency and deposits	3.3	3.9	4.8	4.8	6.3	6.3
Securities other than shares	0.2	0.2	0.2	0.1	0.0	0.0
Loans	0.9	0.9	0.9	0.8	0.8	0.7
Shares and other equity	16.4	17.0	18.3	19.9	20.7	20.1
Other financial assets	11.8	11.8	7.0	7.2	6.9	6.5
Financial Liabilities	55.3	54.6	54.7	55.1	51.7	54.0
Currency and deposits	0.0	0.0	0.0	0.0	0.0	0.0
Securities other than shares	32.5	35.3	40.2	42.0	40.0	42.1
Loans	14.0	10.7	7.6	6.6	5.1	5.3
Other liabilities	8.8	8.6	6.9	6.6	6.6	6.6
Traditional Financial Net Worth	-22.7	-20.8	-23.5	-22.4	-17.0	-20.3

Source: Eurostat.

12.   **In a second step, Poland's long-term fiscal outlook is developed based on a set of long-run macroeconomic projections.** Medium-term GDP, labor market and fiscal projections correspond to the latest IMF outlook for 2009-15 (Tables 2 and 3).[8] Long-run GDP and labor market projections converge to the EC's assumptions, which take into account Poland-specific demographic projections, as presented in the 2009 Sustainability Report. The GDP deflator growth is assumed to converge to the ECB's target of 2 percent in the long run, and the real interest rate is projected to stabilize at 100 basis points above real growth in the long run (Figure 3).[9] Medium-term fiscal projections assume that the consolidation package announced at end-January 2010 will be implemented. All non-age, non-interest related fiscal revenues and expenditures, as well as financial assets and other financial liabilities except for public debt are assumed to remain constant in percent of GDP from 2015 onward. Net aging-related expenditures are taken from the EC's Sustainability Report, which estimates them at -1.2 percent of GDP for 2010-60, making Poland the only EU27 country with negative aging costs.[10] This suggests that the 1990 pension reform is expected to improve the long-run fiscal outlook, though not enough to prevent a build-up of public debt over time (Figure 4).

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[8] As presented in the IMF Report for the 2010 Article IV Consultation with Poland.

[9] Real GDP growth is assumed to converge to the EC's estimated value by 2025 (2.5 percent of GDP) and to follow the path estimated by the Commission thereafter. The deflator and the real interest rate are equally assumed to converge by 2025 to their respective long-run values (for the latter, to the value of growth plus 100 basis points).

[10] The EC's yearly projected differential is added to the latest IMF projection (2015) to obtain the long-run series.

Table 2. Poland: Medium-Term Scenario, 2008-15

|	2008	2009 Est.	2010 Proj.	2011 Proj.	2012 Proj.	2013 Proj.	2014 Proj.	2015 Proj.
Activity and prices								
GDP (change in percent)	5.0	1.7	2.7	3.2	3.9	4.0	4.0	4.0
Domestic demand growth	5.5	-0.9	3.0	3.2	3.8	4.1	4.0	4.1
Private consumption growth	5.9	2.3	1.5	2.5	3.5	3.4	3.3	3.3
Public consumption growth	7.5	1.2	2.0	2.0	2.0	2.0	2.0	2.0
Domestic fixed investment growth	8.2	-0.3	4.5	6.0	6.0	7.5	7.5	7.5
Nominal GDP (zloty millions)	1,273	1,342	1,402	1,481	1,573	1,676	1,786	1,904
CPI inflation (average change in percent)	4.2	3.5	2.3	2.4	2.5	2.5	2.5	2.5
CPI inflation (end of period change in percent)	3.3	3.5	2.3	2.5	2.5	2.5	2.5	2.5
Unemployment rate	7.1	8.0	9.5	10.8	11.2	11.7	11.2	10.8
Gross domestic saving (ratio to GDP) 1/	18.6	18.5	18.7	19.0	19.3	20.2	21.1	22.1
Gross domestic investment (ratio to GDP)	23.7	20.2	21.5	22.1	22.6	23.4	24.2	25.0

Sources: Polish authorities; and IMF staff estimates.

Table 3. Poland: General Government Revenues and Expenditures, 2008-15
(In percent of GDP, ESA95 basis)

	2008	2009 Est.	2010 Proj.	2011 Proj.	2012 Proj.	2013 Proj.	2014 Proj.	2015 Proj.
General government revenue	39.6	37.4	39.4	39.7	40.2	40.4	40.5	40.6
Taxes	22.8	20.5	21.2	21.5	21.8	21.8	21.9	21.9
Indirect taxes	14.2	13.0	13.6	13.7	13.9	13.9	13.9	13.9
Direct taxes	8.6	7.5	7.6	7.7	7.9	8.0	8.0	8.0
Capital taxes	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social contributions	11.4	11.3	11.1	11.0	11.0	11.0	11.1	11.2
Other current revenue	5.0	5.0	5.0	5.0	5.0	4.9	4.9	4.8
Capital revenue	0.4	0.6	2.0	2.2	2.4	2.7	2.7	2.6
General government expenditure	43.3	44.6	46.8	46.6	45.9	45.4	44.9	44.4
Goods and services	6.2	5.9	6.4	6.4	6.3	6.2	6.1	6.1
Compensation of employees	10.0	10.2	10.0	10.0	9.7	9.5	9.2	8.9
Interest payments	2.2	2.4	2.7	2.8	2.9	3.0	3.1	3.1
Subsidies	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.7
Social benefits	16.2	17.2	17.1	16.7	16.2	15.7	15.6	15.5
Other current expenditure	2.6	2.5	2.5	2.4	2.4	2.3	2.2	2.2
Capital transfers and investment	5.4	5.7	7.4	7.5	7.6	7.9	7.9	7.8
General government balance	-3.7	-7.2	-7.5	-6.9	-5.8	-5.0	-4.4	-3.8
Memorandum items:								
Structural balance	-4.3	-6.9	-7.1	-6.9	-5.8	-5.0	-4.4	-3.8
Primary balance	-1.4	-4.8	-4.8	-4.1	-2.8	-1.9	-1.3	-0.7
Structural primary balance	-2.1	-4.5	-4.5	-4.1	-2.9	-2.0	-1.3	-0.7
Public debt	47.2	51.0	55.0	58.3	60.5	61.6	62.3	62.2

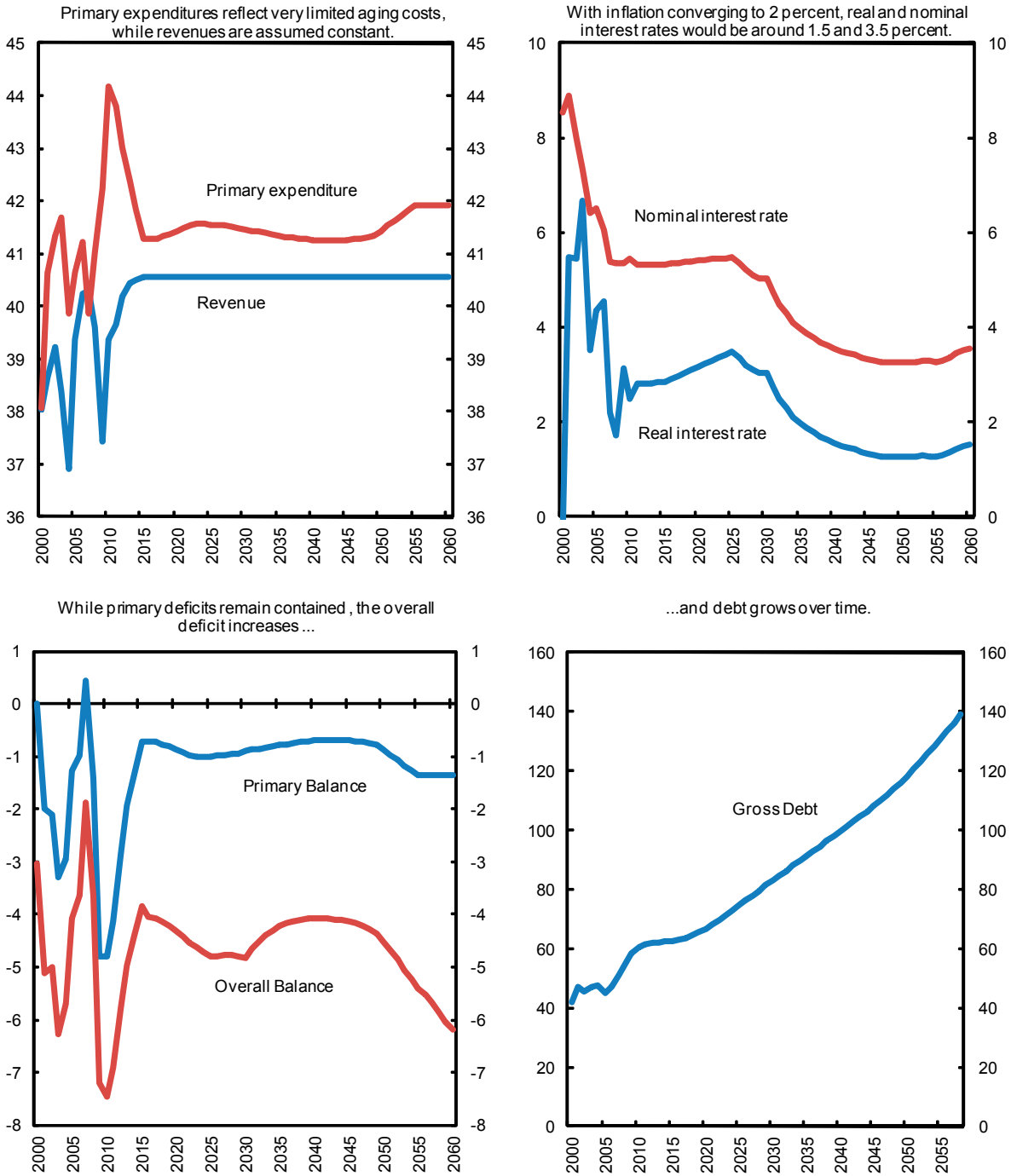Sources: Eurostat; and IMF staff estimates.

Notes: The projections include consolidation measures that have beeen announced but not yet implemented. They do not include additional measures that would be triggered under the Public Finance Act if debt (national definition) exceeds the 55 percent-of-GDP threshold.

Figure 3. Poland: Long-Run Macroeconomic Projections, 2000-60
(Year-on-year percent change)
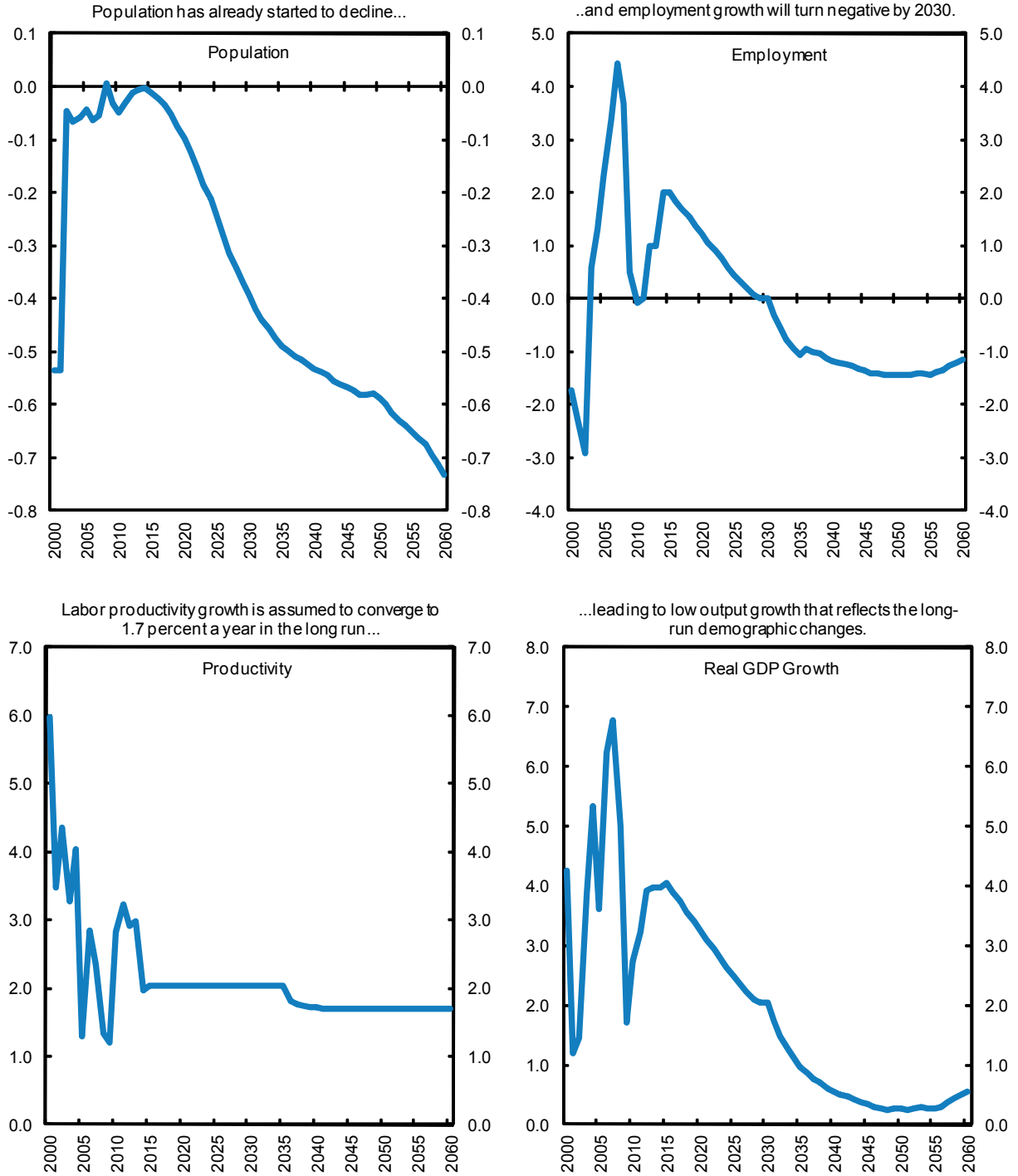
Sources: European Commission; and IMF staff estimates.

Figure 4. Poland: Long-Run Fiscal Projections, 2000-60
(Percent of GDP)

Sources: European Commission; and IMF staff estimates.

13.   **Finally, the comprehensive balance sheet is constructed combining steps one and two above.** This is done by discounting the stream of future primary balances using the nominal interest rate on debt. Two measures are constructed: one that discounts primary balances over a set horizon—50 years—and a second one that assumes an infinite horizon. The two net present values are then added to the current net worth, obtaining both an infinite and a finite-horizon measure of long-run net worth. One the one hand, the infinite-horizon measure is more comprehensive and theoretically appealing, as it considers the effects of current policies in the context of the government's full intertemporal budget constraint. Nevertheless, it may be harder to grasp and could prove weaker from a policy point of view, as, theoretically, such constraints could be satisfied by very high levels of short-term debt and deficits, as long as there is reason to believe that sufficiently large primary surpluses will be achieved afterwards. On the other hand, the finite-horizon measure, although ignoring very long-term effects of current policies, can prove more practical, as it still allows a meaningful long-run analysis, while remaining within the sight of current taxpayers and policy makers.

14.   **For Poland, measures of intertemporal net worth are negative at about 74 and 145 percent of GDP and only slowly falling over time.** Poland's net worth has been calculated for several successive years, to gauge whether current policies imply a relatively constant, worsening, or improving net worth position. Given that primary balances are assumed to stabilize after 2015, given marginal aging costs going forward, their net present value gradually falls, broadly compensating for the expected yearly increase in public debt over the medium term. As a result, intertemporal net worth falls slowly during 2009-15 from 74 to 71 percent of GDP according to the finite-horizon calculation, and from 144 to 140 percent of GDP under the infinite-horizon measure (Table 4). These findings imply that, while current policies (including the recently announced fiscal consolidation package) are not sufficient to satisfy Poland's intertemporal budget constraint, they are not worsening the long-run fiscal position.

Table 4. Poland: Comprehensive Public Sector Balance Sheet, 2009-14
(in percent of GDP)

	2009	2010	2011	2012	2013	2014
Financial Assets	33.7	33.7	33.7	33.7	33.7	33.7
Financial Liabilities	56.3	60.3	63.6	65.8	67.0	67.6
Current Financial Net Worth	-22.6	-26.6	-29.9	-32.1	-33.2	-33.8
NPV of primary balances (50 years)		-51.0	-46.7	-42.8	-40.2	-38.5
NPV of primary balances (infinite)		-122.5	-117.5	-112.9	-109.6	-107.2
Intertemporal Net Worth (50 years)	-73.6	-73.3	-72.7	-72.3	-71.7	-71.2
Intertemporal Net Worth (Infinite)	-144.4	-144.5	-143.2	-142.1	-140.8	-139.7

Source: IMF staff calculations.

15.   **Moreover, Poland's intertemporal net worth is relatively limited compared with other European countries.** Only a few European countries show a sustainable long-run fiscal position as a result of successfully containing the short-run fiscal deterioration due to the crisis in 2009-10 and of pension reforms that contained aging costs. At the other extreme, countries whose short-run fiscal positions deteriorated significantly, some of which also expect very large aging costs in the long run, have net worth in excess of negative 300 percent of GDP under the finite horizon measure and over 1,000 percent of GDP under the infinite horizon measure, suggesting a need for major fiscal consolidation. The EU-27 average is close to 200 percent of GDP under the first measure, and close to 700 percent of GDP under the second measure.[11] Poland ranks well below the average on both these long-term measures, compared to around average on the basis of traditional fiscal indicators (Figure 5). This is mainly because its declining long-run aging costs are expected to partly compensate for higher medium-term deficits and debt.

Figure 5. Poland: Intertemporal Net Worth in a Cross-Country Perspective
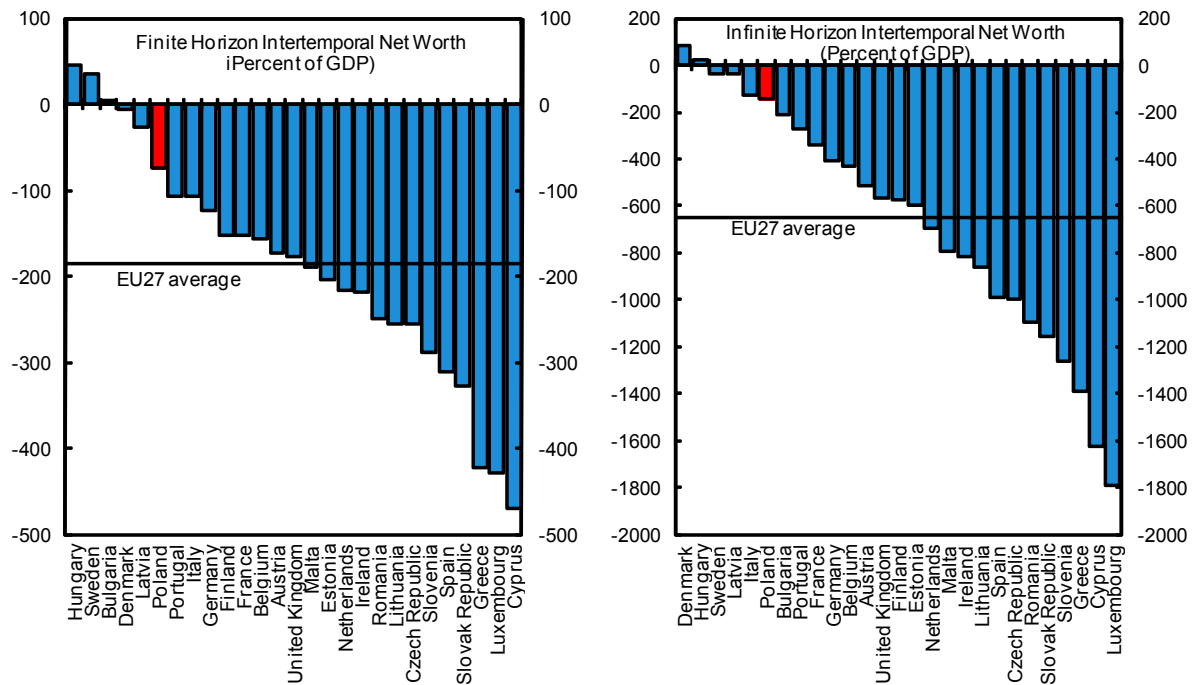
Sources: IMF, *World Economic Outlook*; and IMF staff estimates.

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[11] See Traa and Velculescu (forthcoming) for a description of the methodology and a discussion of results for the EU-27.

16.   **The results for Poland appear fairly robust to changing assumptions, especially over a finite horizon.** Varying assumptions does not appear to affect results for the finite-horizon measures of intertemporal net worth in a significant way. However, changing assumptions regarding the long-run interest rate differential relative to growth and aging costs seems to have an impact on the infinite-horizon measures. For example, an increase/reduction in the interest rate differential relative to growth leads to an improvement/worsening of the intertemporal net worth, as it lowers/raises the discount rate and hence the net present value of discounted primary balances. The effect is magnified at the infinite horizon, as the discount rate plays a larger role in the calculation of the net present value. Similarly, boosting/lowering long-run aging costs increases/shrinks the primary deficit and hence the negative value of intertemporal net worth. Again, the long-run value of the primary balance matters more in the calculation of net present value over an infinite-horizon relative to the finite horizon. Hence, the results should be interpreted with caution and updated when macroeconomic conditions change (Table 5).

Table 5. Poland: Sensitivity Analysis, 2010 Intertemporal Net Worth
(percent deviation relative to the baseline)

	Finite horizon	Infinite horizon
Long-run real interest rate differential relative to growth		
higer by 1/2 ppt	-4	-24
lower by 1/2 ppt	4	72
Long-run real growth rate (keeping the interest differential constant)		
higer by 1/2 ppt	0	0
lower by 1/2 ppt.	0	0
Long-run aging costs		
higer by 1/2 ppt	4	26
lower by 1/2 ppt.	-7	-33
Medium-run real growth rate		
higher by 1/2 ppt.	-8	-10
lower by 1/2 ppt.	7	11

Source: IMF staff calculations.

D.   Policy Implications and Final Remarks

17.   **Poland's comprehensive balance sheet reveals an unsustainable long-run position.** In contrast to traditional fiscal indicators that capture only the current state of public finances and reflect only a small portion of the government's total obligations, the comprehensive balance sheet also takes into account the implications of current fiscal and structural policies for future debt. As such, this framework can be a handy tool to gauge the current fiscal position and set policy objectives in a manner that is consistent with long-run sustainability. Applying this tool to Poland shows that while its net debt represents only about 20 percent of GDP, comprehensive net worth is at around 74-145 percent of GDP. This

difference shows that policies need to be strengthened to bring future liabilities in line with the government's capacity to generate assets.

18.   **The current baseline analysis suggests that Poland's current policies need to adjust by about 1.5 percent of GDP to ensure a balanced net worth position.** A simple calculation can be made to see how much a 1 percent of GDP permanent improvement in the primary balance implemented in 2010 would yield in NPV terms. Compounding the 1 percent amount by a time-varying discount rate—taking into account GDP growth and the assumed interest rate— yields about 50 percent of GDP if it is done for 50 years, or 125 percent of GDP if it is done forever. Consequently, a minimum upfront adjustment of about 1.5 percent of GDP (in addition to the measures already announced by the authorities in early 2010) would be needed to bring intertemporal net worth to zero, thus satisfying the government's intertemporal budget constraint.[12] Alternatively, such a fiscal consolidation could be undertaken gradually, over a few years, although this would likely imply a somewhat larger overall adjustment. The current requirement under the EDP, which suggests an upfront consolidation of about 3 percent of GDP to attain the Maastricht deficit threshold of 3 percent of GDP by 2012 would be more than sufficient to also restore fiscal sustainability over the long run.

19.   **The fiscal adjustment should focus on spending reforms and be complemented by broad structural reforms**. The comprehensive balance sheet does not provide a clear answer regarding the type of policies that would be desirable, except to say that they need to be permanent to have an effect on long-run net worth. Hence, this tool needs to be complemented with an analysis of country-specific circumstances to be able to deliver concrete policy recommendations. For Poland, given that ¾ of total spending is statutory, reforms, especially of social expenditures, are needed to ensure that expenditures do not fall out of line with the country's capacity to generate revenues. A clear fiscal rule that limits spending and the deficit could also be helpful. On the revenue side, there is relatively limited space to increase direct taxes, due to recent cuts in personal income taxes and social security contribution rates. Hence, efforts could focus more on broadening the tax base. Finally, broad structural reforms aimed at making labor and product markets more efficient are crucial to increase the level of potential GDP in the long-run, thus helping generate additional revenues and lowering the country's debt burden.

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[12] These measures are similar in spirit to the EC's S1 and S2 indicators. They differ from those in as much as the underlying assumptions are different. As Traa and Velculescu (forthcoming) show, parametric measures of intertemporal net worth can also be directly obtained from the S1 and S2 indicators. In the case of Poland, these are estimated at about -125 and -170 percent of GDP for the finite and infinite horizon measures, respectively, somewhat higher than those estimated here mainly due to the EC's higher assumed medium- and long-term primary deficit, which does not include the recently announced measures.

20.   **The comprehensive balance sheet could be used to assess policy plans and strengthen communication of policy messages to the public.** They could be published and updated yearly, perhaps in the budget document, to show how net worth is evolving over time. Policy makers can also use this tool to assess and present planned policy changes to voters. For example, the government's proposed measures to broaden the tax base and limit discretionary expenditure growth, estimated to yield about ¼ percent of GDP permanent improvement in the primary balance, have already reduced the negative net worth of the public sector by more than 10 and 30 percent of GDP under the finite-horizon, and the infinite-horizon measure, respectively. This can indicate to the public that: (1) a relatively small short-run, permanent adjustment can have significant long-run benefits; but (2) the package needs to be complemented with other, more significant measures to ensure intertemporal solvency. Further pension reforms, including of uniformed personnel and farmers, and equalizing the retirement age, could entail additional long-run savings that would usefully serve to further reduce the negative net worth of the public sector. However, definitional changes, or the proposal to lower payments to the private pension funds in an effort to lower short-run headline deficits would not have any impact on intertemporal net worth, as long-run liabilities resulting from pension payments that would need to be made remain unchanged.

21.   **Nevertheless, this tool should be used and interpreted with some caution**. In contrast to traditional indicators, which can be easily measured according to well-established methodologies, the comprehensive public sector balance sheet is based on a series of assumptions regarding long-run growth, the interest rate, as well as estimates of long-run costs that are subject to large uncertainty. As such, the net worth point estimates obtained depend on the underlying assumptions. In Poland's case, the results appear fairly robust to the macroeconomic assumptions used, as indicated by the sensitivity analysis. Still, it should be noted that fiscal costs from population aging could be higher, if pressures arise to increase pensions and finance them from the budget, which could lead to a larger negative net worth.[13] Therefore, what should be emphasized when using the comprehensive balance-sheet methodology is not as much the precise point value obtained, but rather its sign, order of magnitude, and the direction in which it is evolving over time as a result of economic developments and national policies.

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[13] This is because replacement rates are projected to decline significantly from over 50 percent now to about 30 percent by 2060, while the number of elderly will exceed that of the working population by 2060. This raises interesting political economy questions about the sustainability of the sharp decline in replacement rates, especially if a "war of generations" will develop and lead to fiscal pressures to raise pensions (I am thankful to Krzysztof Rybinski for this point).

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APPENDIX 1: MATHEMATICAL DERIVATION OF THE INTERTEMPORAL NET WORTH

22.   **The intertemporal budget constraint (solvency condition) tests the ability of the government to meet its net debt obligations (or current net worth) with a stream of future primary surpluses.** For solvency to hold at a given point in time, future primary surpluses have to be equal to or larger than the current net worth at that point in time (NW_t):

$$CNW_t \le \sum_{t=t_0}^{\infty} \frac{PB_t}{\prod_{n=0}^{t}(1+i_n)},$$

where PB_t are the primary balances at each point in time (government receipts minus expenditures net of interest payments), discounted over time by the nominal interest on debt i_t.

This inequality can be expressed in percent of GDP as:

$$cnw_t \le \sum_{t=t_0}^{\infty} pb_t \prod_{n=0}^{t} \frac{1+g_n}{1+i_n} = \sum_{t=t_0}^{\infty} pb_t \cdot \delta_t,$$

where g_t is the nominal growth rate of GDP, with δ_t being the growth-adjusted time-varying discount factor.

If the discounted sum of future primary surpluses exceeds the current net worth, the budget constraint is satisfied. If future primary surpluses fall short of cnw, then current fiscal policies would require strengthening to meet the government's solvency condition.

23.   **The infinite-horizon intertemporal net worth is defined as the difference between the discounted sum of future primary surpluses under current policies and current net worth.** For simplicity, current net worth only takes into account the *financial* assets and liabilities of the state (thus excluding public sector capital stock etc., which in theory should be included, but for which data is scarce or even unavailable).. This can be positive or negative, depending on whether current policies are enough to generate (or not) sufficient primary surpluses in the future to cover current net worth.

$$\boxed{inw_t = \sum_{t=t_0}^{\infty} \overline{pb}_t \cdot \delta_t - cnw_t}$$

24.   **A finite horizon inw* can be defined as the difference between the discounted sum of future primary surpluses under current policies over a specific period of time, and current net worth.** Defining such a measure over a foreseeable period rather than over an infinite period may be easier to grasp by the general public (voters). Moreover, it will help avoid time-consistency problems, and thus strong incentives to postpone painful policies into the (far) future, which plague infinite-horizon budget constraints that, theoretically, could be satisfied by very high levels of short-term debt and deficits, as long as there is reason to believe that sufficiently large primary surpluses will be achieved afterwards. The finite horizon inw up to 2060 is therefore defined as:

$$inw_t^* = \sum_{t=t_0}^{2060} \overline{pb}_t \cdot \delta_t - cnw_t$$

Hence, the finite horizon inw* is related to its infinite horizon counterpart directly. If it can be assumed that from 2060 onward, the nominal interest rate, GDP growth rate, and the primary balance are constant, and i>g, then inw can be written as:[14]

$$inw_t = \sum_{t=t_0}^{2060} pb_t \cdot \delta_t + \sum_{t=2060}^{\infty} \overline{pb} \cdot \delta_t - cnw_t = inw_t^* + \overline{pb}_{2060} \cdot \sum_{t=2060}^{\infty} \left(\frac{1+g}{1+i}\right)^{t-t_0} = inw_t^* + \overline{pb}_{2060} \cdot \frac{\delta_{2060}}{1 - \frac{1+g}{1+i}}$$

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[14] Here sums are approximated with integrals: $\sum_{t=a}^{b} x^t = \int_a^b x^t dt = \frac{x^b - x^a}{\ln x}$ and also use $\frac{-1}{\ln x} = \frac{1}{1-x}$