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April 25, 2017

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CONTENTS

CREDIT GROWTH AND ECONOMIC RECOVERY IN EUROPE: THE CASE OF HUNGARY[1]

This paper reviews the relationship between real GDP growth and domestic bank lending to the private sector in Hungary after the global financial crisis (GFC), drawing on a cross-country analysis of European countries. The recessions that followed the GFC were deeper and lasted longer than the average recession. The recoveries have been characterized by tepid domestic bank lending to the private sector despite low interest rates. Hungary, like some other countries, even experienced a credit-less recovery. While it is difficult to disentangle the causality, this analysis concludes that: (i) both credit demand and supply were adversely affected by the GFC; (ii) key factors influencing credit developments include loan quality, deposit funding, and bank capital, as well as the macroeconomic environment; and (iii) lending by Hungarian banks to the private sector seems to be finally beginning to pick up.
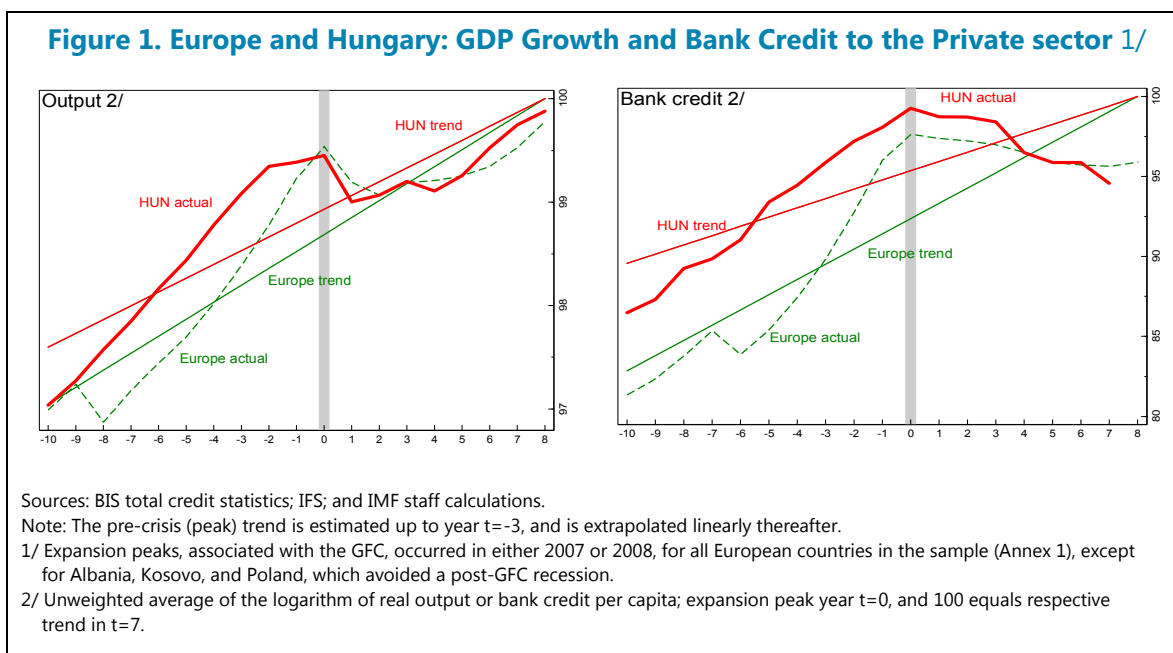
A.   Introduction

1.   The 2008 GFC had a significant and permanent impact on real GDP and domestic bank credit growth in Europe, including Hungary (Figure 1). Before the GFC, most European countries experienced rapid economic and domestic bank credit growth. In many Central European and South Eastern European (CESEE) countries, it was fueled by expectations about convergence to average EU income levels and prospects of EU membership, including in Hungary, which became a member in 2004. This was conducive to foreign direct investment (FDI) and substantial inflows of EU funds, which boosted sentiments and employment prospects as well as the demand for credit. Domestic bank lending increased rapidly, fueled by banks' easy access to foreign funding, as many parent banks faced saturated home markets. Much of the lending, however, was often channeled into real estate. The GFC shattered expectations, including on the perceived appropriateness of private sector debt levels (Bakker and Klingen, 2012). It took five years for CESEE countries, as a group, and six years for Hungary to reach pre-GFC real GDP per capita levels, as the private sector deleveraged. Domestic bank lending is just beginning to recover in Hungary, despite low nominal interest rates.

2.   This paper draws on a cross-country and bank-level analysis to help inform policy discussions on real growth and bank lending in Hungary (Antoshin et al, forthcoming). Section B compares Hungary's recession and recovery paths to peers, as well as to normal and financial-crisis recoveries. Section C, using a bank-level cross-country panel, reviews how various bank

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Figure 1. Europe and Hungary: GDP Growth and Bank Credit to the Private sector 1/

Sources: BIS total credit statistics; IFS; and IMF staff calculations.
Note: The pre-crisis (peak) trend is estimated up to year t=-3, and is extrapolated linearly thereafter.
1/ Expansion peaks, associated with the GFC, occurred in either 2007 or 2008, for all European countries in the sample (Annex 1), except for Albania, Kosovo, and Poland, which avoided a post-GFC recession.
2/ Unweighted average of the logarithm of real output or bank credit per capita; expansion peak year t=0, and 100 equals respective trend in t=7.

fundamentals and selected macro factors have correlated with bank credit to the private sector. Section D focusses on the correlation between GDP growth and bank lending over the cycle. Section E describes the deleveraging that has taken place in Hungary, and most other CESEE countries, and examines recent trends in non-performing loans (NPLs), new lending based on transaction data, as well as lending surveys. Section F summarizes the main findings.

B. Was the Post GFC-Recovery in Hungary Different?[2]

3.   This section compares Hungary's recovery after the GFC to peers. Drawing on Jordà et al (2013), the local projection method, developed by Jordà (2005), is used to project recession and recovery paths. The following specification is used:

$$\Delta_h y_{i(r)+h}^k = \propto_i^k + \emptyset_h N_{it(r)} + \gamma_h F_{it(r)} + \varphi_h N_{it(r)} * \left(x_{it(r)} - \overline{x_N}\right) + \theta_h F_{it(r)} * \left(x_{it(r)} - \overline{x_F}\right)$$
$$+ \sum_{j=0}^{\Sigma} \beta_j^k Y_{it(r)-j} + e_{it(r)}^k$$

The dependent variable (y) is the cumulative change in key macroeconomic variables (real GDP per capita, real private-sector consumption per capita, real investment (GFCF) per capita, and real bank credit to the private sector per capita) from the beginning of each recession and recovery period included in the analysis.[3] N and F are dummy variables indicating whether the recession and

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[2] In the cross-country paper, this analysis is performed by John Ralyea (EUR). For details on the data and methodology, see Antoshin et al (forthcoming).

[3] Per capita was used, since some countries have experienced noticeable changes in their population since 1999.

recovery episode was preceded by a financial crisis (F) or not (N).[4] The control variables include: measures of *excess* credit accumulated during the expansion period $\left(x_{it(r)} - \overline{x_{F \text{ or } N}}\right)$ preceding the recession; and a vector Y of the standardized percentage change in the dependent variables before the start of each recession. Finally, $\propto$ represents the fixed effect for ith country; and e is the error term. The projection paths are based on sample of Advanced Economies (AE) and Emerging Market (EM) economies since the post Bretton Wood era and covers 57 countries (Appendix I).

4.   **The coefficients $\emptyset$ and γ are used to construct the projection paths for "normal" non-financial and financial recession and recovery paths.** Intuitively, $\emptyset$ and γ correspond to the average cumulative response of the dependent variable at each horizon (projection) period. They are plotted in the first column of Figure 2 below. The coefficients are derived from observations on a sample of 79 recession and recovery episodes across 35 advanced and large emerging-market countries (hereinafter referred to as the control group) that occurred from the beginning of the post-Bretton Woods era up to the eve of the GFC (1971–2006).[5]

5.   **Hungary's real GDP per capita since the GFC broadly followed the path of other CESEE countries.** Hungary's recession, however, was deeper because it was also affected by the European sovereign debt crisis due to its high public debt. It only caught up with peers in 2015. Compared to normal and financial-crisis recessions from which it usually takes two to three years to recover, the CESEE countries took on average about five years to reach pre-GFC real GDP per capita levels while Hungary took six years.[6] Private consumption per capita declined more in Hungary than in peers. In contrast, investment per capita did much better than the average for CESEE countries. This is likely because of FDIs—with Hungary being an integrated part of the German supply chain (IMF, 2013)—but perhaps also because it was among the new EU member states that received the largest amounts of EU structural and cohesion funds per capita. The absorption of these funds was accelerated toward end-2015, as the 2007–2013 program period came to an end and these funds would have been lost if not used by end-2015. Like other CESSE countries, Hungary's current account improved after the GFC, in part due to import compression, but also due to much stronger exports facilitated by sturdier external demand as the global recovery transpired.

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[4] A distinction is made between *normal* recessions and recoveries and those related to a *financial crisis*, i.e. those having had a systemic banking crisis as defined by Laeven and Valencia (2012). Two main conditions must be met to qualify for a systemic banking crisis. First, (Laeven and Valencia (2012, page 4): "Significant sign of financial stress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations." Secondly, "Significant banking policy intervention measures in response to significant losses in the banking system." This definition implies that some countries may not have had a systemic banking crisis, if they have not met three of the six sub-conditions being "significant," although they may still have experienced severe financial tensions, like Hungary.

[5] 28 separate regressions were run (7 regressions for each dependent variable) with a projection horizon of 7 years, consistent with the post-GFC period from 2009–2015. The sample episodes include 20 recession and recovery periods in European countries. Out of the total episodes, 64 were classified as non-financial and 15 as financial recessions. The Bry and Boschan (1971) algorithm was used to date business cycles across countries.

[6] Poland avoided a recession, while Croatia's experienced a prolonged recession and has not yet reached pre-crisis real GDP.

Figure 2. Hungary and Emerging Europe: Performance Relative to Projection Paths
(cumulative percentage change from start of recession, percent)

GFC; standard model	Sovereign debt crisis (2011); control external demand
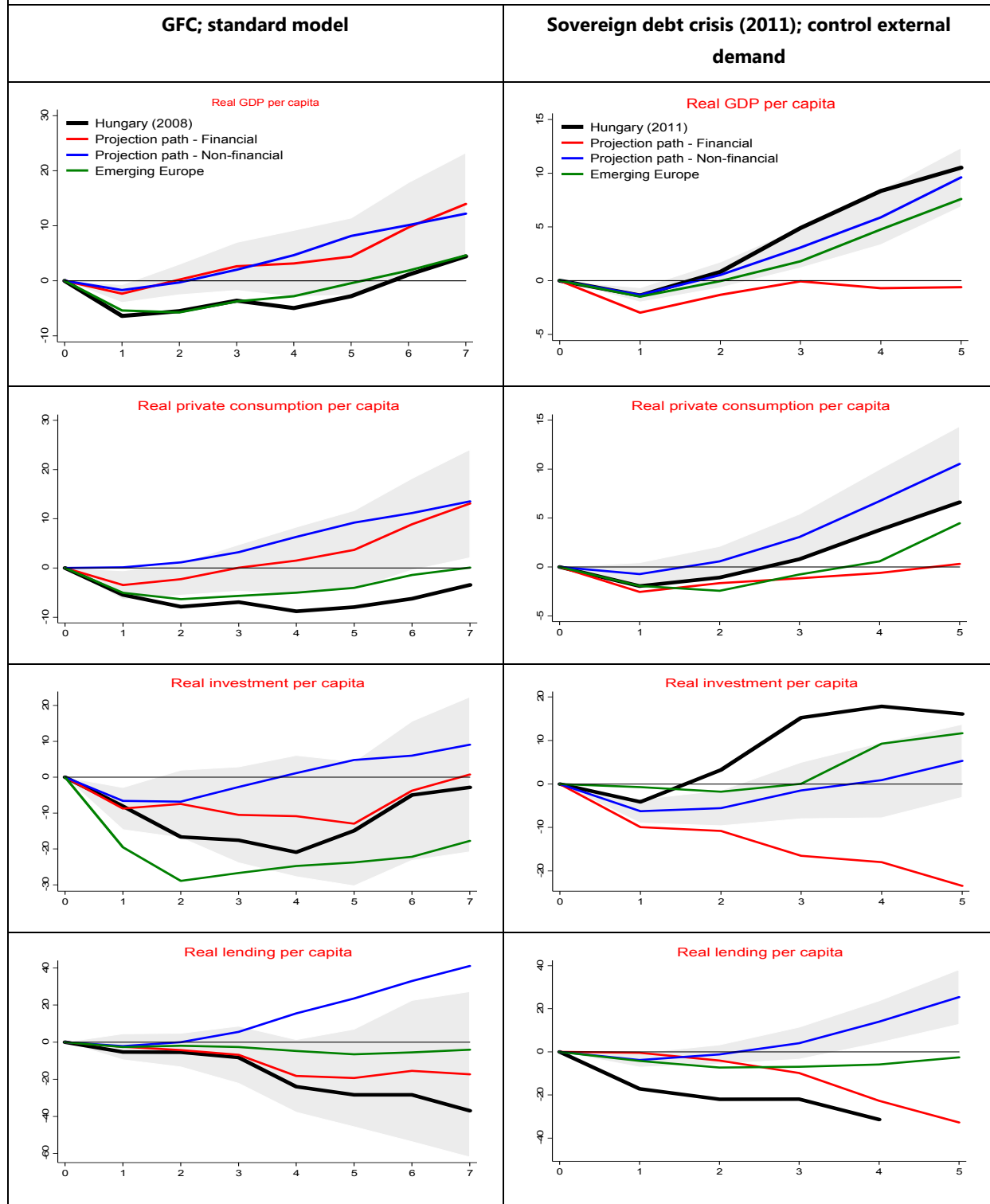
Sources: BIS total credit data; Hungarian authorities; IMF staff calculations.

6.   Lending to the private sector by Hungarian banks remained much more subdued than in other CESEE countries and even worse than in countries recovering from a financial crisis. Hungary did not have a financial crisis per the definition specified by Laeven and Valencia (2012), but Hungary is classified as a border line case. Shortly after the GFC, some Hungarian banks faced challenges accessing global financial markets. This in part motivated the arrangement agreed with the IMF in November 2008 (which expired in October 2010). Moreover, the rapid increase in NPLs, disputes and court cases between banks and particularly their household clients, as well as global discussions about tighter prudential regulation may have contributed to increased uncertainty that may have adversely affected banks' willingness as well as their ability to lend. In December 2014, the resolution of MKB bank was initiated and it was successfully finalized in mid-2016. These factors may help explain why Hungary's credit recovery path is close to that following a *financial-crisis* recession and recovery. Subdued bank lending may have had less impact on growth, since large reputable companies—particularly foreign subsidies but also Hungarian owned companies—financed themselves abroad (see Section E).

7.   Hungary's recovery path since the European sovereign debt crisis was then compared to peers controlling for differences in external demand. The "counterfactual dependent variable paths" were estimated in order to control for the extremely weak global demand environment that followed the GFC. First, a contemporaneous external demand variable based on actual data was included as a regressor in the standard equations described above to estimate its influence on the "typical" projection path. Secondly, this external demand variable was rescaled to reflect, on average, the external demand faced by European countries after the GFC. Thirdly, new counterfactual dependent variables were generated using the coefficients and values of the regressors from the first step. The counterfactual external demand values were then substituted for the observed external demand. These steps resulted in counterfactual dependent variables, which represented "what-if"' estimates of the dependent variables had the control group countries faced the same subdued external demand that European countries faced post-GFC. The standard regressions were then re-run with the new counterfactual dependent variables. The generated coefficients were used to construct the projection paths for non-financial and financial recession and recovery episodes plotted in the second column of Figure 2.

8.   This model shows that since the European sovereign debt crisis, Hungarian real GDP growth per capita has recovered faster than other CESEE countries and even better than the typical recovery after a non-financial recession. Hungary's private consumption per capita in this scenario did better than peers. Although still subdued compared to a normal recovery, it was largely within the confidence interval of a normal recovery. Investment was still estimated to have done better than peers, likely due to buoyant FDIs and EU funds, as mentioned above. Domestic bank lending, however, remained subdued under these assumptions. These results can in part be attributed to the fact that large reputable non-financial companies, being part of regional supply chains, had easy access to foreign financing, as suggested earlier.
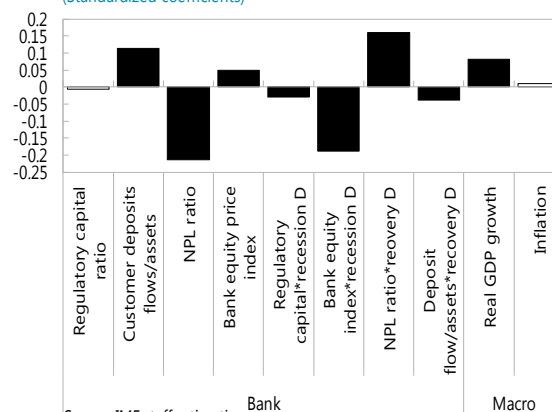
C.   Factors Influencing Bank Credit in Europe and Hungary[7]

9.   A bank-level cross-country panel was used to assess how bank fundamentals and selected macro factors correlated with credit dynamics during 1999–2015. The unbalanced panel included 37 countries, as well as Hungary, and up to almost 8000 banks during the 1999–2015 period.[8] Different specifications were tried using system generalized method of moments (GMM).[9] The size of the bars in the chart represents the effect of a one-standard-deviation change in the respective regressor on credit growth in percentage points. Black filled bars indicate that these coefficients are statistically significant.

Europe: Determinants of Credit Growth 1/
(Standardized coefficients)

Source: IMF staff estimations.
1/ D stands for dummy.

10.   The presence of large foreign-owned banks in many CESEE countries may explain why regulatory capital and funding seemed less crucial for credit growth in these countries. The bank fundamentals include non-performing loan ratio (NPL) (-), customer deposits (+), bank equity index (+), and regulatory capital ratio (-), with the NPL ratio and customer deposits being the most important. As expected, the main macroeconomic influence on credit growth appears to be real GDP growth. It is a proxy for both demand and the ability to service the debt: as output increases, so did bank lending to the private sector. Inflation also had a positive although insignificant effect.

11.   In Hungary, similar factors have likely been in play. Unfortunately, the number of available observations for Hungarian banks in the sample were insufficient to use a similar specification for Hungary. The chart shows that real credit growth to the private sector of the Hungarian banks included in the sample (the black line) is within the confidence interval of the model. Moreover, lending by Hungarian banks in the sample is moderately lower than for peers after the

Bank credit
(Annual percentage change)

95% CI — Europe (fitted) — Hungary (annual average, sample)

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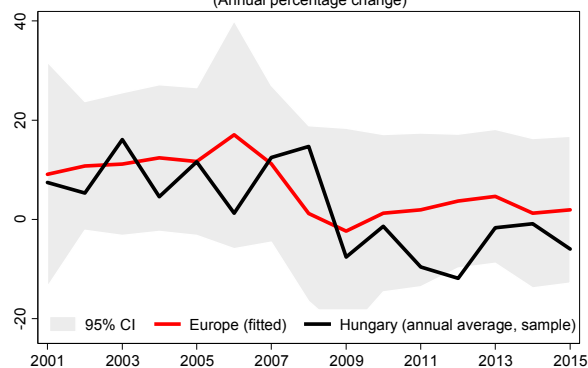
[7] In the cross-country paper, this analysis is performed by Etienne Yehoue. For details on the data and methodology, see Antoshin et al (forthcoming).

[8] The annual macro data are from the *World Economic Outlook* data base, while the individual bank data are from *FitchConnect*. Unconsolidated balance sheets were used unless only consolidated balance sheets were available. Extreme values were removed from the sample. The key variable for credit growth was provided by *FitchConnect,* but the high degree of variability, even after removing outliers, suggest that the results are only indicative.

[9] The GMM methodology helps mitigate endogeneity issues, while the larger dataset alleviates multicollinearity challenges. Even with the use of several instrument variables, it is obviously difficult to disentangle causality. See, for instance, Everaert et al (2015).

GFC, although well within the confidence interval. It is thus possible that the same explanatory factors were also valid for Hungary. Figure 3 shows key indicators for the Hungarian banking system since 2000, although the definitions of the ratios have changed during this period. They show the lending boom, in part foreign funded, before the GFC; then a sharp increase in NPL and decrease in lending following the GFC; whereupon provisions increased, and cushions strengthened during the recovery, as the banks deleveraged.

Non-Performing Loans

12.   As expected, the NPL ratio was significant and negatively correlated with credit growth in the cross-country analysis, but its impact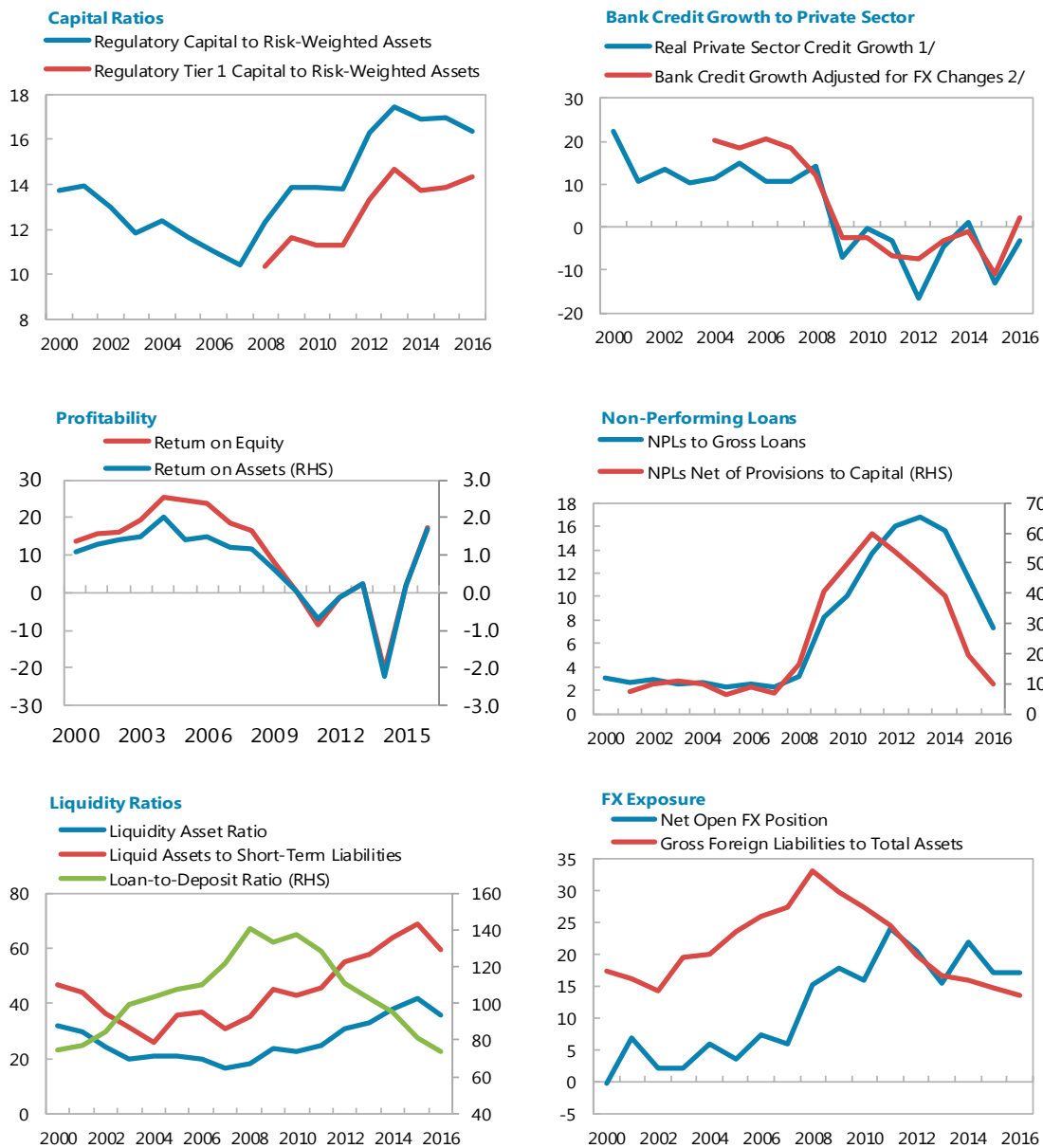 diminished during the recovery. Increasing NPLs is a symptom of problems in the economy that were not captured by a bank's past credit policies. Initially they may trigger a change in risk perception and hence more conservative credit policies and thus adversely affect the willingness to lend. As provisions are expected and required, they absorb profits and perhaps even equity, hence hampering banks' ability to lend. However, if the NPLs are appropriately and timely priced and provisioned, the NPL ratio should in principle not affect new lending. NPLs are a consequence of past credit policies, while a rational bank should make its new lending decisions based on its forward-looking projection of the expected net present value.

13.   Nevertheless, a high NPL ratio, even if fully provisioned, could hamper new lending. This may be the case if the ratio adversely affects funding costs, causes concerns about the evaluation of collateral and thus inadequate provisions, adverse market sentiment, or bank management's pre-occupation with NPLs instead of new businesses. In the panel analysis, it is noticeable that the NPL coefficient becomes much less negative during recoveries, suggesting that if credit demand improves, then a high NPL ratio seems to be less of a concern. It is possible that during the recovery, most of the provisioning has already happened and is less of a potential constraint on equity to cover new risks.[10] Furthermore, if the NPL is not written off even if fully provisioned by the bank, or if the loan is sold to a non-bank debt collection agency, the debtors may still be suffering. If the issue is not being resolved at the debtor level, it can still suppress their activity, including their demand for new loans to viable projects. In our view, these findings underpin standard recommendations to deal with NPLs of banks:

- **Timely provisions of NPLs is critical to not restrain future credit growth**. This includes prudent conservative evaluation of collateral;

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[10] Unfortunately, sufficient data were not available to use the un-provisioned part of NPLs instead of the gross NPL ratio. This would be akin to use the *Texas ratio*, which is defined as the value of the lender's non-performing assets divided by the sum of its tangible equity and loan loss reserves.

Figure 3. Selected Indicators of the Hungarian Banking System, 2000–2016

Capital Ratios
- Regulatory Capital to Risk-Weighted Assets
- Regulatory Tier 1 Capital to Risk-Weighted Assets

Bank Credit Growth to Private Sector
- Real Private Sector Credit Growth 1/
- Bank Credit Growth Adjusted for FX Changes 2/

Profitability
- Return on Equity
- Return on Assets (RHS)

Non-Performing Loans
- NPLs to Gross Loans
- NPLs Net of Provisions to Capital (RHS)

Liquidity Ratios
- Liquidity Asset Ratio
- Liquid Assets to Short-Term Liabilities
- Loan-to-Deposit Ratio (RHS)

FX Exposure
- Net Open FX Position
- Gross Foreign Liabilities to Total Assets

Sources: Hungarian authorities; IMF *Financial Soundness Indicators Database*; IMF, *International Financial Statistics (IFS)*; previous IMF Staff Reports; and IMF staff calculations.
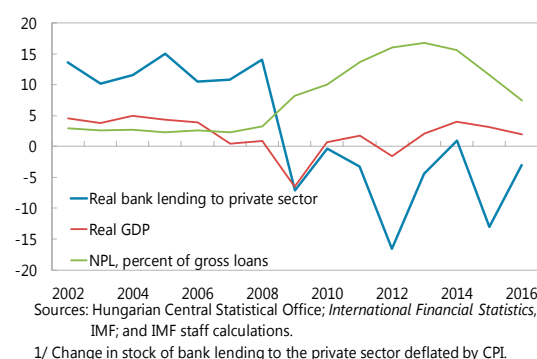Note: Definitions of ratios have changed and are not fully consistent over time.
1/ Bank credit to the private sector as reported in IFS, deflated by CPI inflation.
2/ Bank credit growth to households and non-financial firms (transaction data, i.e., adjusted for exchange rate changes).

- **A credible strategy to resolve the stock of NPLs is important**, as it helps remove many real or perceived lingering uncertainties, as recommended in IMF (2015); and,

- **Strengthen the debt recovery framework by making it more timely, efficient, predictable, and thus less costly for both borrowers and lenders.** This is conducive for new lending, as it reduces the risk premium and perceived risks.

14.   The Hungarian authorities have since the GFC taken numerous initiatives to address the high NPL ratio.[11] One of the biggest challenges has been to deal with non-performing commercial real estate loans, while dealing with consumer loans has been particularly contentious. The NPL ratio trend has been successfully reversed since 2014. Moreover, new lending has reportedly very low NPL ratios.

Hungary: Real Private Credit Growth, NPL, and Real GDP
(Percent change, yoy)

Sources: Hungarian Central Statistical Office; *International Financial Statistics*, IMF; and IMF staff calculations.

1/ Change in stock of bank lending to the private sector deflated by CPI.

Customer Deposits

15.   Increasing customer deposits appear to facilitate bank lending. The customer deposit variable is significant with a positive sign in the bank-level cross-country analysis, although it is smaller during recessions. Obviously, less dependence on more volatile wholesale funding reduces vulnerabilities.[12] In Hungary, following the GFC, the deposit growth of both households and non-financial companies decelerated, but new lending was less than amortizations. The loan-to-deposit ratio of firms and households thus declined from 140 at end-2008 to 83 percent at end-2016. This allowed Hungarian banks to also deleverage and reduce their dependence on wholesale funding from aboard—mainly from their parents.

Bank Capital

16.   Bank regulatory capital, as percent of total assets, is associated with negative bank lending in the cross-country analysis, especially during recessions. This could imply that an increase in the regulatory requirement or perceived risks, makes banks less able or willing to lend. The more capital constrained banks may be inclined to observe higher capital requirements by

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[11] Among the recent measures for households, the conversion of FX denominated loans during 2015 reduced the uncertainty for many borrowers. A Personal Bankruptcy Law became effective in September 2015 for mortgages and in October 2016 for all household loans. While not used much—about 650 cases were in process at end-February 2017—it facilitated ending the moratorium on evictions. In 2016, the MNB also published its recommendations on resolving defaulting mortgage loans. In 2014, the MNB established an asset management company for non-performing project loans to commercial real estate (MARK). It has been sold to the private sector (the transaction expected to be finalized in June 2017), given improved market conditions. Effective July 1, 2017, a special capital charge (systemic risk buffer) will be applied to banks with an extraordinary large share of non-performing commercial real estate loans. Details about these and the many previous initiatives can be found in various issues of the MNB's *Financial Stability Reports* and *Macro Prudential Reports*.

[12] However, in periods with very low wholesale interest rates, banks face a trade-off as a large retail funding base may be costlier but more reliable.
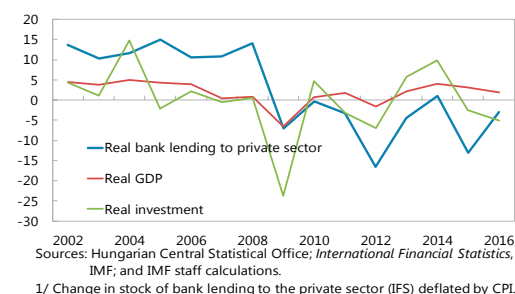
deleveraging rather than raising new capital. This seems to be the case, probably during recessions when bank equity capital may be relatively more expensive, as corroborated by coefficient for the bank equity index. However, this variable is not significant for the CESEE sample, suggesting it was more important for parent banks. Banks not in need of increasing capital—likely the more conservative ones during the boom—probably had more restrictive credit standards. Hungarian banks have managed to increase their capital adequacy ratio since the GFC, but to a large extent by reducing their risk-weighted assets.

D.   GDP Growth and Credit Growth in Europe and Hungary[13]

17.   Bank credit is important for output growth, but perhaps less than often perceived.[14] A statistically significant positive but modest correlation between economic growth and bank credit growth was found for 39 European countries during the 1999–2015 period. Annual data from the *World Economic Outlook, International Financial Statistics,* and BIS' *Total Credit to the Non-Financial Sector* for 18 advanced European economies and 18 CESEE countries were used. A dynamic GMM panel estimator (Blundell and Bond, 1998) was used to estimate the relationship between real GDP growth

Hungary: Real GDP, Investment, and Private Credit Growth
(Percent change, yoy)

Sources: Hungarian Central Statistical Office; *International Financial Statistics,* IMF; and IMF staff calculations.
1/ Change in stock of bank lending to the private sector (IFS) deflated by CPI.

and bank credit (Table 1, Appendix II).[15] A 10 percent increase in domestic bank credit to the private sector correlates with real GDP increasing by about 0.6-0.7 percent. The main channel seems to be investment, as a 10 percent credit growth raises investment by 2 percent (Table 2, Appendix II). In general, these relationships did not change much during the recession and recovery periods.

18.   In some countries, the relationship between real GDP growth and domestic bank credit was more complex and sometimes negative after the GFC, showing signs of a "creditless" recovery.[16] During the recovery period, however, the relationship between credit expansion and GDP growth was stronger when using the change in credit growth (credit impulse, Biggs et al, 2009) rather than credit growth. It was found that the credit impulse influenced GDP growth strongly and significantly during the post-GFC recessions and recoveries (Table 3, Appendix II).

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[13] In the cross-country paper, this analysis is performed by Marco Arena. For details on the data and methodology, see Antoshin et al (forthcoming).

[14] There are two strands of literature. One arguing that increased credit and financial deepening facilitate growth, which indeed is the case if agents are liquidity constrained. The other is concerned about over-indebtedness, when credit is extended to unsustainable projects and borrowers with insufficient cushions, hence adversely affecting growth, when balance sheets adjust.

[15] The complex specification cannot be estimated on individual countries given the limited number of observations.

[16] The definition of "creditless" here refers to domestic banks lending.

19.   Hungary experienced a creditless recovery, but alternative funding sources may have alleviated the strain. As previously mentioned, large non-financial manufacturing companies, often foreign-owned exporters, had access to foreign or intra-group financing.[17] Moreover, EU funds, including generous advance payments and grants, may have eased the dependence on domestic bank credit to finance investments, which was confirmed in a survey by the European Investment Bank (EIB, 2017).[18] This survey also found that while bank financing was the most important kind of *external* financing for investments, the share of surveyed Hungarian companies that rely on internal financing for investments was higher than the EU average. Moreover, the share of surveyed Hungarian companies that reported being finance-constrained was higher (13 percent on average, 17 percent for SMEs) than the EU average (5 percent).[19]

E.   Hungary's Balance Sheet Recession

20.   Following the GFC and the European sovereign debt crisis, the private sector in Hungary, like most other CESEE countries, reduced its indebtedness. Figure 4 shows that, Hungarian households and non-financial companies—similarly to many other CESEE countries after the GFC—reduced their debt and built up savings rather than borrowing to invest and consume.[20] This likely deepened the recession—and triggered a "balance sheet recession" (Koo, 2003 and 2011)—and slowed the recovery.[21]

21.   Net-financial assets of the Hungarian private sector continued to increase as the recovery gained traction. Net financial assets of households declined to about 41 percent of GDP in 2008, but have since increased to almost 87 percent of GDP (estimated, Q3 2016). This trend largely squares with the development of savings rates. Net-financial assets of non-financial companies declined around the GFC and European sovereign debt crisis, but have since also improved. This is corroborated with better earnings in recent years. The increase in financial assets suggest that numerous households and companies were not liquidity constrained. For these agents, sluggish demand and economic policy uncertainty after the GFC may have been more important for lowering their marginal propensity to consume and invest than liquidity constraints.

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[17] IMF (2009, Box 3.2) found that (page 116): "… disruptions to the supply of credit may not matter much for firms that are highly dependent on outside funding if they produce goods that are highly tradable."

[18] The EIB survey was based on phone interviews with 476 Hungarian companies during July – October 2016. The results were weighted by the value-added of the firms.

[19] The cross-country analysis assessed if various manufacturing sectors that typically are more dependent on external financing had suffered more in terms of value-added and investments after the GFC. The results, however, including for Hungary, were inconclusive.

[20] Figure 3 is not adjusted for revaluation effects, the data are unconsolidated, meaning intra-company loans are not netted out, and country specific conditions obviously affect the perceived "optimal" debt level, as for instance discussed by Jarmuzek and Rozenov (2017).

[21] The MNB (2016, chapter 5) estimates that: (i) excess credit during the credit boom (2002–2008) increased annual real GDP by about 0.4 – 0.8 percent; and, (ii) the deleveraging after the GFC reduced annual real GDP growth by about 1.1 – 1.4 percent during 2009–2015.

Figure 4. Private Sector Balance Sheets in CESEE Countries, 2002–2016

Debt of Households in Central and Eastern Europe, 2000-16 1/
(in percent of GDP)

Debt of Non-Financial Companies in Central and Eastern Europe, 2000-16 2/
(in percent of GDP)

Financial Assets of Households in Central and Eastern Europe, 2000-16 2/
(in percent of GDP)

Financial Assets of Non-Financial Companies, Central and Eastern Europe, 2000-16 2/ (in percent of GDP)

Net Financial Assets of Households in Central and Eastern Europe, 2000-16 1, 2/ (in percent of GDP)

Net Financial Assets of Non-Financial Companies in Central and Eastern Europe, 2000-16 1, 2/ (in percent of GDP)

Sources: Eurostat (balance sheet data); IMF *World Economic Outlook* (nominal GDP); and IMF staff calculations.

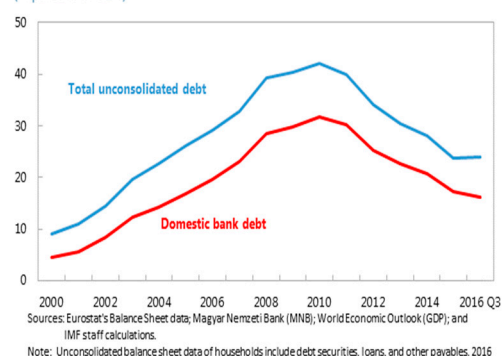1/ Unconsolidated data including debt securities, loans, and other payables. 2016 Q3 are preliminary estimates.

2/ Unconsolidated data including cash and deposits, debt securities, loans, equity and investment fund shares, and other payables. 2016 Q3 are preliminary estimates.

3/ EU CESEE countries include Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia, and Slovakia.

22. **Both total credit and domestic bank loans to Hungarian households have declined**

since the sovereign debt crisis. Right after the GFC,
credit to households as share of GDP continued to
increase until the sovereign debt crisis hit, but mainly
due to exchange rate effects of FX denominated
loans. The deleveraging accelerated after the
sovereign debt crisis. The share of domestic bank
loans now accounts for about 70 percent of total
household debt. The current debt-cap rules became
effective January 1, 2015.[22] Recent changes in the
legal and regulatory framework are nurturing an
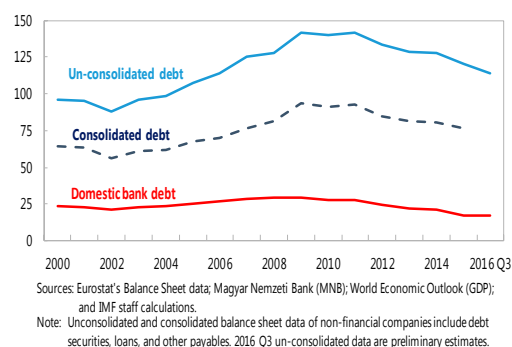emerging mortgage bond market.

Hungary: Debt of Households, 2000-16
(in percent of GDP)

Total unconsolidated debt

Domestic bank debt

Sources: Eurostat's Balance Sheet data; Magyar Nemzeti Bank (MNB); World Economic Outlook (GDP); and
IMF staff calculations.
Note: Unconsolidated balance sheet data of households include debt securities, loans, and other payables. 2016

23. **The share of domestic bank loans as share of the total financial debt of Hungarian**
non-financial companies has declined from almost 25 percent in 2000 to about 15 percent at

end-2016. The large reputable companies had access
to foreign funding, as previously mentioned, and even
domestic capital markets. Hungary's capital markets,
in particular the commercial bond market, remain
relatively modest. Weaker companies with sparse
collateral or short track record were facing immediate
liquidity constraints after the GFC. In 2013, the MNB
thus introduced the *Funding for Growth Scheme* (FGS),
where the MNB provided inexpensive liquidity to
banks to on-lend to micro, small, and medium-sized
enterprises (SMEs) with an interest cap.[23] The FGS did
help many SMEs with working capital as well as new

Hungary: Debt of Non-Financial Companies, 2000-16

Un-consolidated debt

Consolidated debt

Domestic bank debt

Sources: Eurostat's Balance Sheet data; Magyar Nemzeti Bank (MNB); World Economic Outlook (GDP);
and IMF staff calculations.
Note: Unconsolidated and consolidated balance sheet data of non-financial companies include debt
securities, loans, and other payables. 2016 Q3 un-consolidated data are preliminary estimates.

investments.[24] The MNB decided to let the measure expire at end-March 2016, as market conditions
improved. The *Market-Based Lending Scheme* was introduced in January 2016 and offers incentives
to banks that commit to increase their lending micro companies and SMEs.

24. **Hungarian banks' lending to households and non-financial companies contracted after**
the GFC, as NPLs increased. The NPL ratios have since reversed, first for firms and then for

households. The NPL ratio of both households and non-financial corporations have declined during
2016, but more importantly, the shares of un-provisioned loans have also declined (Figure 5). Banks
have cleaned up their portfolio of NPLs by selling them or writing them off. Moreover, real estate
prices have improved substantially since 2014, hence permitting revoking provisions, which boosted

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[22] For details on the MNB's macroprudential policies, see the MNB's *Macroprudential Report*, October 2016.

[23] After the GFC, many countries introduced measures to support both credit supply and demand (GFSR, 2013, Table
2.3).

[24] At end-March 2017, nearly 40,000 micro and SMEs had received loans during the various phases of the FGS. For
more information on its impact, see, for instance, Endresz et al (2015) and László (2016).

banks profitability in 2016. The increasing NPL trend following the GFC has thus been broken, helped by numerous legal and prudential initiatives to strengthen the debt recovery frameworks and encourage out-of-court settlements, as well as generally improved market conditions.

Figure 5. Hungarian Banks' Lending and NPLs to Households and Non-Financial Companies

Households: Non-Performing Loans and Bank Credit, 2010-16

— NPLs, percent of loans
······ Provisions, percent of loans
-- - Loan growth, percent y-o-y

Sources: Hungarian National Bank (MNB); and IMF staff calculations.
Note: Change in credit stocks (not deflated).

Non-Financial Companies: NPLs and Bank Credit, 2010-16

— NPLs, percent of loans
······ Provisions, percent of loans
-- - Loan growth, percent y-o-y

Sources: Hungarian National Bank (MNB); and IMF staff calculations.
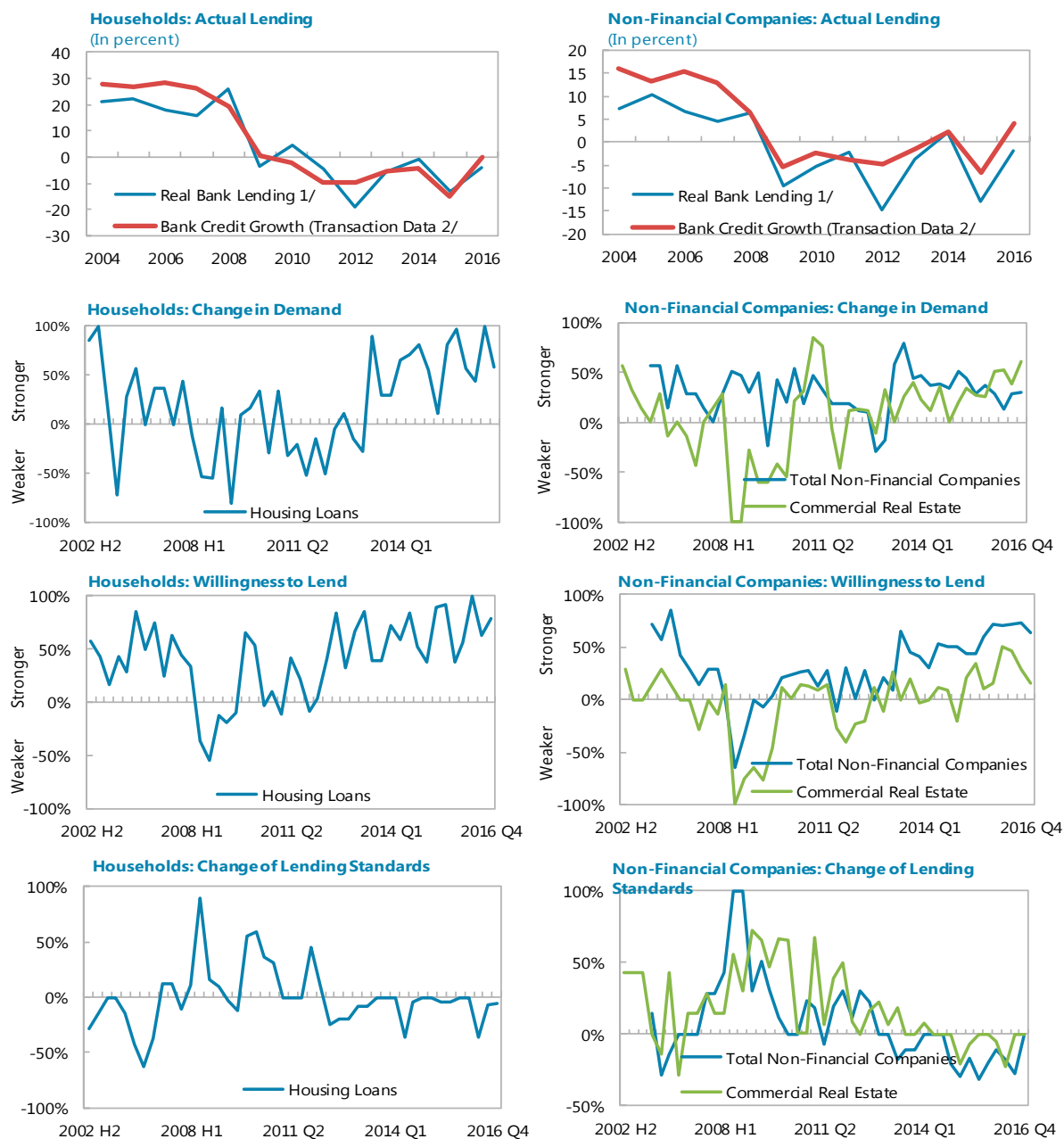Note: Change in stocks. Lending includes FGS-funded loans. Not deflated.

25.   It is intrinsically difficult to disentangle whether lending has been subdued due to lack of demand or lack of supply, but lending surveys can offer a helpful clue. Figure 6 shows that both the demand for credit and the supply of credit contracted immediately after the GFC and the sovereign debt crisis, and have only gradually recovered. It seems that supply recovered before demand, at least for loans to households. Obviously, not just the average, but also the distribution matters, as different households and companies had different degrees of cushions to withstand the GFC.

26.   New bank lending to households and particularly non-financial corporations seems to finally be picking up. The bank lending data used for the cross-country analysis are the change in stock of credit deflated by CPI inflation. This measurement can be misleading, since it does not consider changes in the amortization flows, sales of NPLs to non-banks, write-offs, closure of banks, as well as exchange rate effects. In recent months, new lending to particularly non-financial companies but also households have picked up when using transaction data (Figure 6). The reduced vulnerabilities and debt levels, as well as improved macroeconomic prospects underpin anecdotal reports that many banks are expecting to increase their lending during 2017.

F.   Conclusion

27.   Hungary, like most other European countries, experienced a deeper and longer recession following the GFC than what could have been expected from historical experience, but has recovered since 2013. The GFC triggered a deleveraging of private balance sheets, which suppressed the marginal propensity to consume and invest. Hungary experienced all the hallmarks of a so-called "*balance sheet recession.*" Moreover, Hungary, like some other European countries

Figure 6. Hungarian Banks' Lending Surveys, 2002–2016

Households: Actual Lending
(In percent)

Real Bank Lending 1/
Bank Credit Growth (Transaction Data 2/

Non-Financial Companies: Actual Lending
(In percent)

Real Bank Lending 1/
Bank Credit Growth (Transaction Data 2/

Households: Change in Demand

Housing Loans

Non-Financial Companies: Change in Demand

Total Non-Financial Companies
Commercial Real Estate

Households: Willingness to Lend

Housing Loans

Non-Financial Companies: Willingness to Lend

Total Non-Financial Companies
Commercial Real Estate

Households: Change of Lending Standards

Housing Loans

Non-Financial Companies: Change of Lending Standards

Total Non-Financial Companies
Commercial Real Estate

Sources: Magyar Nemzeti Bank (MNB); and IMF staff calculations.
Note 1: Lending surveys indicate the percentage of respondents reporting an increase or decrease in demand, their willingness to lend, or tightening of their lending standards compared to past period, weighted by their market share.
Note 2: Quarterly data begins Q1 2009.
1/ Change in credit stock deflated by CPI.
2/ Bank credit growth based on transaction data, i.e., adjusted for exchange rate changes.

with high public debt, faced a double-dip recession related to the European sovereign debt crisis. The global nature of the GFC compounded the policy challenges to instigate the recovery. Hungary's real GDP has recuperated and in 2014 was at par with the 2008 output level, benefitting from being part of the German supply chain as well as EU funds. Employment has also exceeded the pre-crisis level—even excluding those participating in the *public work scheme*—and companies are increasingly reporting labor shortages.

28.   Hungary's recovery has so far been creditless. Historically, creditless recoveries are not uncommon, particularly after periods of rapid credit growth.[25] Hungary has shown that real growth and job creation can happen without rapid domestic bank credit growth. However, special conditions may have facilitated this process, since domestic bank credit has not been the only source of financing. The large reputable companies had access to foreign financing. Moreover, it is possible that relatively generous advance payments related to partially EU funded projects may have alleviated financial strains as the private sector deleveraged. The MNB took, like authorities in other countries (GFSR, 2013), initiatives to support SMEs—the most liquidity constrained companies. These initiatives seem to have had some positive impact (Endresz et al (2015) and László (2016)). Such programs, however, also entail risks that must be carefully managed. Numerous measures to address NPLs, including the conversion of FX denominated household loans during 2015, have likely also helped reduce uncertainties or substitute them with more manageable ones. Nevertheless, domestic bank lending to the Hungarian private sector remained subdued and only recently begun to recover as reflected in transaction data.

29.   This study found that there is a significant positive correlation between real growth and bank lending, but that it is modest and could thus occasionally be overstated. One of the key lessons from the GFC must be that not all credit automatically provides *sustainable* growth and job creation. Credit-fueled booms, if based on exuberant and unrealistic expectations, will later be followed by painful adjustments. Or as Irving Fisher (1933, page 341) noted: "...*over-confidence seldom does any great harm except when, as, and if, it beguiles its victims into debt*."

30.   Finally, the study, underpins that: (i) timely provisioning; as well as (ii) resolving the inherited stock of NPLs; while, (iii) strengthening the debt recovery frameworks are critical for a sustainable recovery supported by new viable bank lending (IMF, 2015). In principle, fully provisioned NPLs should not hamper new lending. Nevertheless, lingering uncertainty about the evaluation of collateral can still hamper credit supply. In Hungary, the recent recovery of the real estate market and banks' revocation of provisions may be an opportune time to review and bolster prudently conservative collateral evaluation policies.

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[25] For instance, Claessens, Kose and Terrones (2009 and 2011, page 26) conclude that: "... recessions accompanied with financial disruption episodes, notably house price busts, tend to be longer and deeper while recoveries combined with rapid growth in credit and house prices tend to be stronger." Abiad, Dell'Ariccia, and Li (2011) find that creditless recoveries are significantly deeper and longer after financial crises. Jordà et al. (2013) argue that financial indicators, like credit, tends to amplify the business cycle, and (Jordà et al., 2014) that the recovery path is even worse when the credit-fueled crisis coincides with elevated public debt. Taylor (2015) confirms that one in four recessions are caused by financial crises and that these recessions are deeper and longer, with inflation subdued and credit recovery slow.

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Appendix I. Country Groups

Euro area - advanced	Other European - advanced	Central, Eastern, and Southeastern European	Other
1 Austria *	1 Denmark *	1 Albania	1 Argentina *
2 Belgium	2 Iceland *	2 Bosnia & Herzegovina	2 Australia *
3 Cyprus *	3 Israel *	3 Bulgaria	3 Brazil *
4 Finland *	4 Norway *	4 Croatia	4 Canada *
5 France *	5 Sweden *	5 Czech Republic	5 China,P.R.: Mainland
6 Germany *	6 Switzerland *	6 Estonia	6 China,P.R.:Hong Kong *
7 Greece *	7 United Kingdom *	7 Hungary	7 India *
8 Ireland *		8 Kosovo	8 Indonesia
9 Italy *		9 Latvia	9 Japan *
10 Malta *		10 Lithuania	10 Korea, Republic of *
11 Netherlands *		11 Macedonia, FYR	11 Malaysia *
12 Portugal *		12 Montenegro	12 Mexico *
13 Spain *		13 Poland	13 Philippines *
		14 Romania	14 Singapore *
		15 Russian Federation *	15 South Africa *
		16 Serbia, Republic of	16 Turkey *
		17 Slovak Republic	17 United States *
		18 Slovenia	

1/ Belarus, Luxembourg, Moldova, San Morino, and Ukraine not included in sample.

* Countries with expansion peaks in 1971-2006 that are included in LP regression to derive projection paths.

Appendix II. Selective Regressions

Table 1. GDP Growth and Bank Credit to the Private Sector: Recession and Recovery

Dynamic panel data; two-step system GMM estimator

Sample of 39 European countries, estimation period: 1999-2015

	(1) Full sample	(2) AE	(3) CESEE
GDP growth rate (t-1)	0.219**	0.149**	0.0967*
	(0.085)	(0.066)	(0.060)
Private sector credit growth	0.0711***	0.0871**	0.0558***
	(0.021)	(0.031)	(0.016)
Private sector credit growth * Dummy recession[1]	0.0726	-0.0249	0.0170
	(0.096)	(0.093)	(0.094)
Private sector credit growth * Dummy recovery[2]	0.0308	-0.0424	-0.0581
	(0.062)	(0.063)	(0.095)
Public consumption growth rate	-0.469*	0.206**	0.0280
	(0.251)	(0.090)	(0.051)
Private sector credit-to-GDP ratio	-0.0129*	-0.00857	-0.0405***
	(0.008)	(0.011)	(0.012)
External demand [3]	0.253**	0.216***	0.145**
	(0.077)	(0.033)	(0.063)
Log (VIX)	-0.00388	-0.00760*	-0.0148*
	(0.005)	(0.004)	(0.009)
Dummy recession	-0.0281**	-0.0123**	-0.0369***
	(0.009)	(0.006)	(0.006)
Dummy recovery	0.000669	0.00920**	-0.000121
	(0.004)	(0.004)	(0.006)
Constant	0.0349**	0.0267	0.0821**
	(0.018)	(0.021)	(0.029)
No. Obs.	576	331	244
No. countries	39	21	18
No. instruments	20	21	20
Autocorrelation test, p-value	0.317	0.162	0.317
Hansen test, p-value	0.121	0.252	0.353

Standard errors in parentheses. * $p<0.10$, ** $p<0.5$, *** $p<0.001$

1/ Dummy takes the value of 1 during the recession period.

2/ Dummy takes the value of 1 during the recovery period.

3/ Volume of trading partners imports weighted by exports' shares.

**Table 2. Private Gross Fixed Capital Formation (GFCF) and
Bank Credit to the Private Sector**

Dynamic panel data; two-step system GMM estimator

Sample of 39 European countries, estimation period: 1999-2015

	(1) Full sample	(2) AE	(3) CESEE
GFCF growth rate (t-1)	0.168*	0.224**	0.0948
	(0.098)	(0.083)	(0.160)
Private sector credit growth	0.200**	0.181**	0.149*
	(0.103)	(0.069)	(0.092)
General government balance ratio (% GDP)	0.493	0.664*	0.162
	(0.442)	(0.370)	(0.424)
Private sector credit-to-GDP ratio	-0.126**	-0.0743***	-0.324**
	(0.041)	(0.019)	(0.147)
Interest rate (policy rate)	-1.783***	-1.176**	-1.618**
	(0.515)	(0.507)	(0.580)
External demand	0.725**	0.718***	0.416*
	(0.236)	(0.154)	(0.238)
Log (VIX)	-0.0438	-0.00832	-0.131**
	(0.029)	(0.016)	(0.048)
Constant	0.223**	0.0793	0.562***
	(0.105)	(0.067)	(0.162)
No. Obs.	526	302	232
No. countries	38	21	17
No. instruments	18	18	17
Autocorrelation test, p-value	0.123	0.970	0.015
Hansen test, p-value	0.188	0.301	0.343

Standard errors in parentheses. * p<0.10, ** p<0.5, *** p<0.001

Table 3. GDP Growth and Credit Impulse: Recession and Recovery

Dynamic panel data; two-step system GMM estimator

Sample of 39 European countries, estimation period: 1999-2015

	(1) Full sample	(2) AE	(3) CESEE
GDP growth rate (t-1)	0.300***	0.198**	0.300***
	(0.030)	(0.066)	(0.040)
Change in private sector credit growth	-0.0218	-0.0244	-0.0116
	(0.023)	(0.025)	(0.015)
Change in private sector credit growth * Dummy recession[1]	0.0888**	0.109*	0.118**
	(0.031)	(0.058)	(0.060)
Change in private sector credit growth * Dummy recovery[2]	0.0739**	0.0537**	0.0957***
	(0.029)	(0.028)	(0.029)
Public consumption growth rate	0.0838*	0.428***	0.0152
	(0.050)	(0.099)	(0.063)
Private sector credit-to-GDP ratio	-0.0204***	-0.001	-0.0249*
	(0.006)	(0.004)	(0.014)
External demand [3]	0.237***	0.236***	0.265***
	(0.027)	(0.057)	(0.051)
Log (VIX)	-0.00899***	-0.00926**	-0.0104
	(0.003)	(0.004)	(0.009)
Dummy recession	0.00266	0.00817**	-0.00125
	(0.003)	(0.003)	(0.005)
Dummy recovery	-0.0222***	-0.0103	-0.0324**
	(0.006)	(0.007)	(0.012)
Constant	0.0491***	0.0209	0.0556*
	(0.012)	(0.016)	(0.029)
No. Obs.	576	325	250
No. countries	39	21	18
No. instruments	19	21	19
Autocorrelation test, p-value	0.358	0.220	0.514
Hansen test, p-value	0.651	0.294	0.355

Standard errors in parentheses. * $p<0.10$, ** $p<0.5$, *** $p<0.001$

1/ Dummy takes the value of 1 during the recession period.

2/ Dummy takes the value of 1 during the recovery period.

3/ Volume of trading partners imports weighted by exports' shares.

THE GREY ECONOMY AND TAX COMPLIANCE[1]

This chapter describes Hungary's key policy initiatives to enhance tax compliance and reduce the grey economy. Hungary has embarked on a comprehensive strategy to shift segments of the grey economy to the formal sector and improve tax compliance, which has already yielded sizeable gains in terms of VAT revenue. The strategy involved, among other elements, implementation of online cash registers and an electronic system monitoring the road transport of goods movement. Even though impressive efforts have been made, mobilizing additional VAT collection would lower vulnerabilities further. Specifically, simulations suggest that eliminating the VAT gap would reduce the overall deficit by around 2 percentage points and public debt by around 8 percentage points, thus reducing exposure to shocks and creating fiscal space for other initiatives. Beyond increasing tax revenue, moving more of the grey economy to the formal sector has various benefits in terms of increasing access to finance, productivity, and competitiveness.

A. Introduction

1.   The reduction in Hungary's grey economy coincided with improvement in the tax compliance. Estimates of the size of the grey economy suggest that it declined markedly in recent years, but its level remains above the EU average (Schneider, 2016). In parallel, the improvement in tax compliance has been significant although, similarly to the grey economy, its size is also above the EU average (European Commission, 2016).

2.   Addressing the tax compliance challenge and reducing the size of the grey economy can be mutually-reinforcing. High tax rates and wedge have been incentives for looser tax compliance and for unregistered activities to remain in the grey economy. By the same token, simplifying the tax system and strengthening enforcement of compliance would help incentivize a shift to the formal sector. Increasing tax compliance would of course also contribute to improving the fiscal balance and reducing public debt, thus lowering Hungary's vulnerabilities. Although Hungary has been able to reduce its budget deficit from a high level, its public debt is still large, at above 70 percent of GDP.

3.   This chapter describes Hungary's key policy initiatives to enhance tax compliance and reduce the grey economy. Section B defines the concept of the grey economy, presents its main determinants and impact, and looks at Hungary's experience with it. Section C provides a rationale for further VAT revenue mobilization, documents key reforms underpinning the improvement in tax compliance, and presents recent VAT performance. It also runs policy simulations assuming the elimination of the tax compliance gap. Section D concludes.

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[1] Prepared by Mariusz Jarmuzek and Borislava Mircheva.

B. The Grey Economy

4.   The definition of the grey economy can be broad. One commonly used such definition is that it comprises unregistered economic activity that could contribute to the official GDP calculation. A narrower definition of the grey economy, which is used in this note, is that it comprises legal activities, such as undeclared work and underreporting, that are performed outside the reach of legal authorities. Specifically, these are all economic activities that would be legal and generally taxable if they were reported.[2]

5.   Several factors can lead to a large grey economy.[3] High tax and social security contribution burdens can provide an incentive to operate in the grey economy. This tends to be particularly the case when salaries in the informal sector are relatively low and minimum wages in the formal sector do not match productivity. The quality of public institutions is another factor determining the size of the grey economy. Specifically, the informal sector tends to be associated with the inefficient provision of public goods and services as well as with bureaucracies that complicate doing business and breed corruption. Excessive regulations lead to high costs in the formal economy. At the same time, the quality public services may be affected by the existence of a large grey economy that does not pay taxes. Such a large grey economy would also mean higher taxes for firms and individuals in the formal sector.[4] Thus, a vicious circle can be formed, with yet stronger incentives for more firms to stay in the informal sector. Low tax morale and certain social norms may increase the probability of individuals participating in the grey economy. When the grey economy is perceived to be a normal part of society, there is a lack of guilt conscience associated with not registering or paying taxes. Furthermore, when the penalties and/or the chance of getting caught are low, individuals would be more likely to take the risk. The lack of financial development can also contribute to a larger grey economy as cash transactions are typically difficult to trace.

6.   The existence of a grey economy poses several challenges for policymakers. The grey economy would lead to forgone revenue due to the under-reporting of wages and unregistered business activity. Subsequently, such under-reporting could have a negative effect on access to credit from the banking sector. In addition, the undeclared activity could lead to lower quality output as well as working conditions due to the lack of proper regulation or worker and consumer protection. The grey economy also distorts statistical data, and therefore misleads economic policy making.

7.   At the same time, there can be some benefits from the presence of the grey economy. Informal activities can act as a safety net by providing employment and income to people who are otherwise not able to find opportunities in the formal sector. Furthermore, with the existence of a grey economy, certain goods and services may be cheaper and thus more accessible to a larger
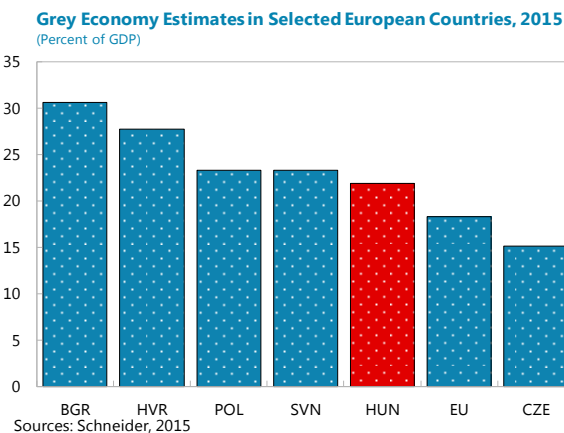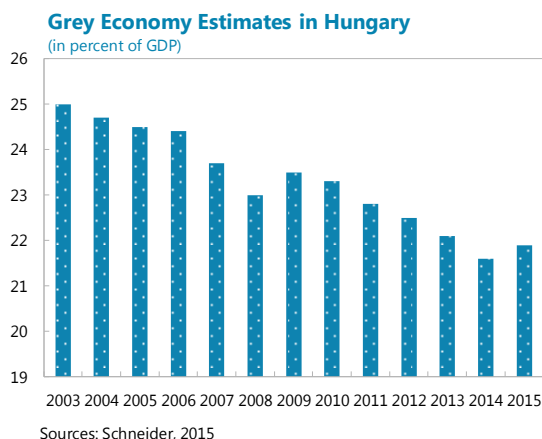
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[2] Schneider and Buehn (2012).

[3] Schneider and Buehn (2016).

[4] Kreko and Kiss (2008) estimate that tax evasion resulted in a transfer of almost 8 percent of GDP from taxpayers to tax evaders in Hungary between 2005 and 2006.

share of the population. The grey economy may also provide an opportunity for existence to micro and small firms that would otherwise struggle due to the high cost and demand on time driven by heavy regulation. In fact, some economists argue that the informal sector plays a key role in facilitating economic activity when regulations are prohibitively excessive.

8.   The Hungarian grey economy remains sizeable, with the high indirect taxes reported to be a key motivator. According to some estimates (Schneider, 2015), the grey economy in Hungary is equivalent to about 22 percent of GDP. This is larger than the EU average (18 percent), but is in line with the situation in regional peers. The above estimate is reached using a methodology which assumed that the grey economy can be estimated using measurable causes of illicit employment (e.g. the tax burden and regulation intensity) as well as indicators reflecting the illicit activities (e.g. the currency demand).[5] The most important factor identified as contributing to grey economy in the case of Hungary is indirect taxes.

Grey Economy Estimates in Hungary
(in percent of GDP)

Sources: Schneider, 2015

Grey Economy Estimates in Selected European Countries, 2015
(Percent of GDP)

Sources: Schneider, 2015

9.   The probability of getting caught and low tax morale are also identified as important determinants of the size of the Hungarian grey economy. For example, Balog (2015) points out that, until 2010, the tax burden on labor income in Hungary was quite high compared to the region. The marginal tax wedge was a high 64 percent, which provided incentives both to employees and employers to underreport wages. Similarly, in the case of consumption taxes, buying products or services from the grey economy, without an invoice, is sometimes reported as being considered an acceptable practice because of the lower cost. Consequently, Lacko (2007) argues that the grey economy is determined by the consumption tax rate and the level of corruption. The empirical results of Toth et al (2015) illustrate that an improvement in the tax morale can curb tax evasion. Such an improvement can stem from a reduction of unemployment or and enhancement of the quality of public services. These improvements can be supplemented by an effort to tighten monitoring and increase the cost of evasion, such as increasing the frequency of audits and their precision, publishing the names of payers in arrears, etc.

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[5] Schneider and Buehn (2012).

C. Tax Compliance

10.   VAT is the largest source of tax revenue item in Hungary. VAT revenue amounts to almost 10 percent of GDP. This is comparable with regional peers. VAT is considered one of the least distortive taxes because it does not discourage savings, work, or investment decisions, especially compared to income taxes. With high domestic consumption (and imports), the potential gains from mobilizing VAT revenue are significant.

Tax revenue
[in percent of GDP]

Source: OECD
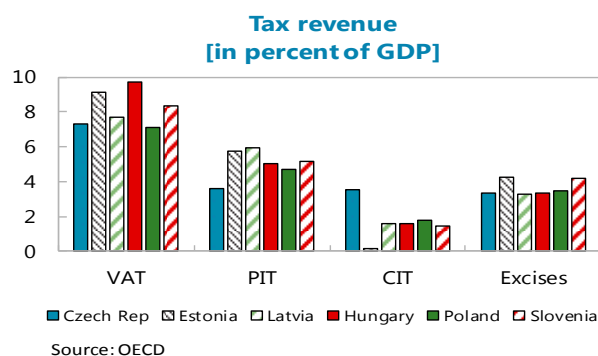
11.   However, Hungary's VAT rates are already high. These rates were increased markedly in the midst of the global financial crisis to mobilize revenue to cope with the large budget deficit. As a result, the standard VAT rate is now 27 percent, which is very high compared to the OECD average and is the highest among regional peers. The effective rate is, however, lower due to the introduction of reduced rates for selected items.[6]
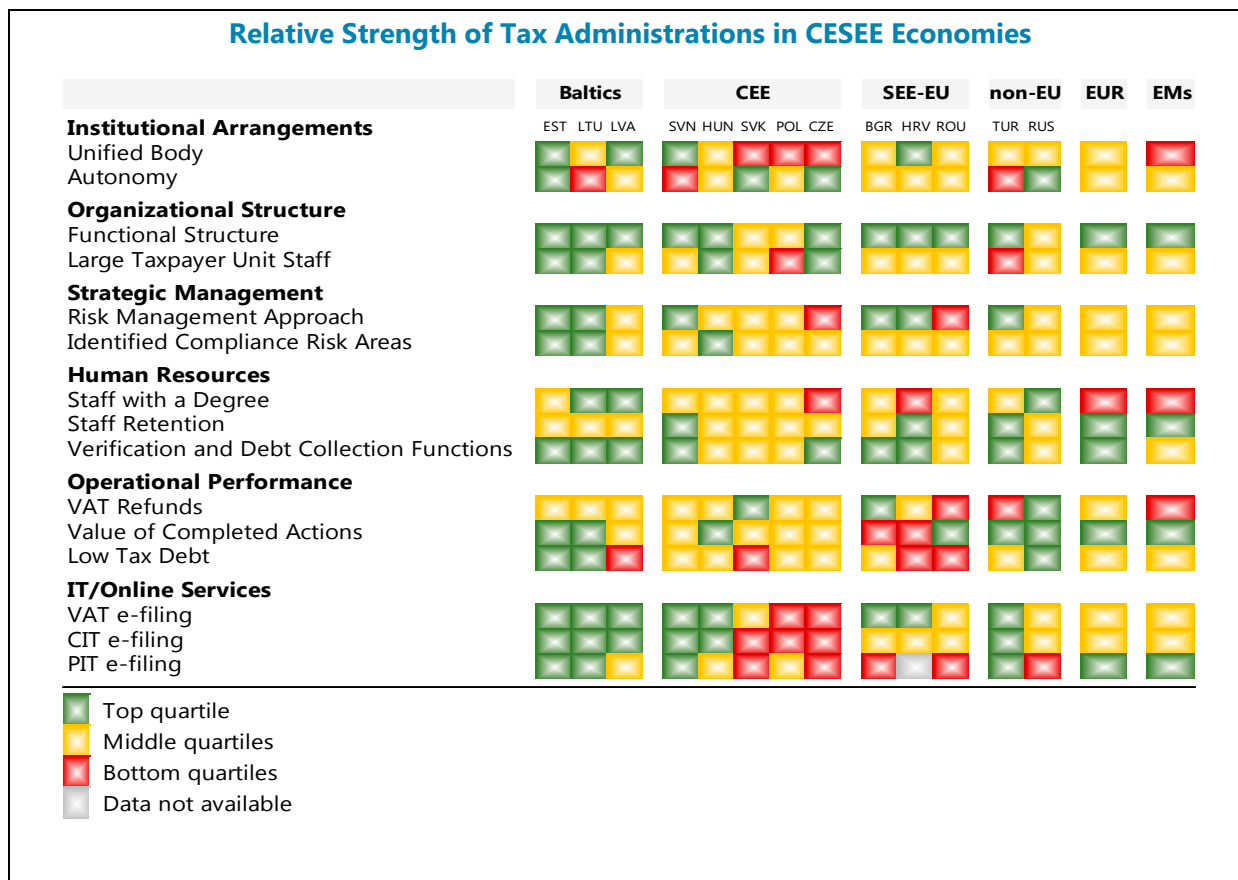
	Implemented	Standard rate								Reduced rates
		2008	2009	2010	2011	2012	2013	2014	2015	
Czech Republic	1993	19	19	20	20	20	21	21	21	10.0/15.0
Estonia	1991	18	18	20	20	20	20	20	20	0.0/9.0
Hungary	1988	20	20	25	25	27	27	27	27	5.0/18.0
Latvia	1995	18	21	21	22	22	21	21	21	0.0/12.0
Poland	1993	22	22	22	23	23	23	23	23	5.0/8.0
Slovak Republic	1993	19	19	19	20	20	20	20	20	10
Slovenia	1999	20	20	20	20	20	20	22	22	10
OECD		18	18	18	19	19	19	19	19	

Source: OECD

12.   There is potential for Hungary to mobilize additional VAT collection through enhanced tax compliance. Drawing on IMF (2016) and OECD (2015), the relative assessment of Hungary's overall tax administration compared to other countries of the Central Eastern and South Eastern European (CESEE) region is strong. Hungary exceled in such aspects of tax administration as organizational structure, strategic management, operational performance, and IT/online services. This positive situation stems from reforms undertaken by the Hungarian authorities since the 1990s and which have been renewed following the eruption of the global financial crisis, especially in terms of enforcement. [7]
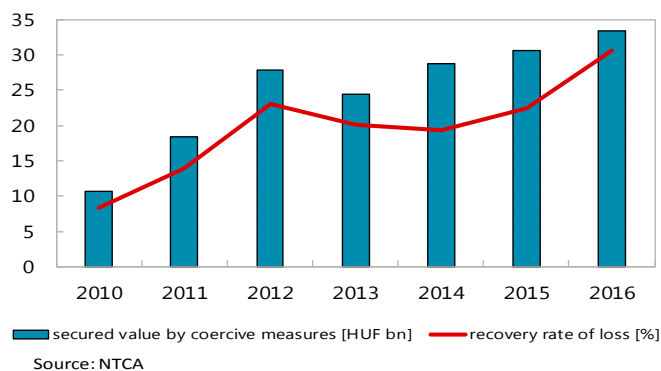
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[6] The items subject to reduced rates were increased in 2016 and 2017.

[7] For selected country experiences, please see IMF (2016). For example, the Estonian Tax and Customs Board has developed into a full service-oriented revenue body that (i) allows maximum simplification in the fulfillment of tax liabilities, through extended use of technology; (ii) conducts upgraded risk analysis through new methods for data

Relative Strength of Tax Administrations in CESEE Economies

	Baltics			CEE					SEE-EU			non-EU		EUR	EMs
	EST	LTU	LVA	SVN	HUN	SVK	POL	CZE	BGR	HRV	ROU	TUR	RUS		
Institutional Arrangements															
Unified Body															
Autonomy															
Organizational Structure															
Functional Structure															
Large Taxpayer Unit Staff															
Strategic Management															
Risk Management Approach															
Identified Compliance Risk Areas															
Human Resources															
Staff with a Degree															
Staff Retention															
Verification and Debt Collection Functions															
Operational Performance															
VAT Refunds															
Value of Completed Actions															
Low Tax Debt															
IT/Online Services															
VAT e-filing															
CIT e-filing															
PIT e-filing															

Legend:
- Top quartile
- Middle quartiles
- Bottom quartiles
- Data not available

Source: IMF (2016) and OECD (2015)

13.   The Hungarian authorities have embarked on a comprehensive strategy to improve VAT compliance following the global financial crisis. An initial step of the strategy was to move all tax and customs administration activities to one organization. The National Tax and Customs Administration (NTCA) was created in 2011 by the merger of the Hungarian Tax and Financial Control Administration and the Hungarian Customs and Finance Guard. An important and integral element of the administration has been the General Criminal Directorate, which is a central agency operating with great autonomy, with more resources directed there. It performs fiscal investigative tasks as well as investigations with respect to crimes endangering the revenue of the budget and the violations of law related to intellectual property. The financial investigators perform their work in

[Chart: bar and line chart, years 2010–2016]
- secured value by coercive measures [HUF bn]
- recovery rate of loss [%]

Source: NTCA

analysis; and (iii) has developed capacity to administer tax arrears very effectively through improved information systems.

cooperation with professional staff in fields of taxation, customs, and excise. Unifying tax and customs administrations along with the strengthening of the Criminal Directorate has coincided with higher loss recovery rate and secured value by coercive measures. Furthermore, the tax registration procedure and the regulatory supervision were enhanced in 2012.

14.   **The implementation and execution of the enhanced tax registration procedure was also an important preventive measure**. The enhanced procedure aimed at reducing the risk of registering firms that do not intend to conduct any real business activity and are used to engage in fraud, especially VAT carousel and refunds. Since its introduction in 2012, around 90 percent of registrations have been identified as having no impediments, but in around 5 percent of the cases the tax authorities have denied the request for the registration, and in around 5 percent of the cases the tax authorities have deregistered tax payers (NTCA, 2017).

15.   **The introduction of the online cash registers has been a critical element of the strategy**. The electronic connection of cash registers to the tax authorities has been implemented to monitor the turnover of the cash registers on a real-time basis, helping detect fraud more efficiently. The number of cash registers connected to the tax authorities reached around 250 thousand by the end of 2016, although only selected activities have so far been covered by this program (MfNE, 2016).

16.   **The implementation of the Electronic Trade and Transport Control System** (**EKAER) in 2015 has been another important element of the strategy**. The EKAER was set up in an effort to curb VAT fraud, enabling the monitoring of the road transport of goods movement. The purpose of the system is the strengthening of law-abiding businesses, assurance of the transparency of goods traffic, the exclusion of frauds with food that often jeopardize human health, and screening tax evaders. In case of irregularities, a default penalty up to 40 percent of the value of goods of uncertified origin can be imposed. Since its introduction in 2015, more than 60 thousand taxpayers and around 6.5 thousand transporters have registered on the interface of EKAER, accounting for more than 60 percent of domestic registrations (NTCA, 2017).

17.   **Other relevant measures are reducing the threshold for VAT and increasing VAT returns reporting frequency**. The threshold of the itemized VAT was reduced in 2015 to help detect risky invoicing networks. This reduction became possible thanks to enhanced capacity to handle an increased amount of data by the tax administration. The reporting frequency in the VAT returns was increased for newly established taxpayers without a predecessor for the first two years of their business activity recently. At the same time, taxpayers became required to report their VAT declaration on a quarterly basis if sales exceed a certain amount in the second year preceding the tax year (NTCA, 2017).

18.   **New measures are being introduced in 2017 to further improve tax compliance**. Online cash registers are being extended to the services sectors. These sectors include taxi services, foreign exchange bureaus, repair and maintenance of vehicles and activities related to spare parts sale, laundry services, and various services improving physical well-being. The authorities are about to

introduce a system of online invoicing that aims at reducing fraud through making the data reporting on invoices a real-time process and enhancing the collection of overdue tax liabilities.

19.   These reforms have led to an improved VAT tax compliance and revenue. VAT collection increased from 8.9 percent of GDP in 2013 to 9.7 percent of GDP in 2015.[8] Given no significant changes in policy in terms of rate, the factors that could help explain the improvement are the tax base and compliance. The increase in tax collection was higher than the estimated increase of the tax base. This suggests that improved compliance related to tax administration reforms was the main factor

Estimated VAT and purchased consumption of households

Source: MfNE

behind the increase in revenue (MNB, 2015). Indeed, improvements in VAT performance coincided with the implementation of online cash registers in 2014 and its expansion in 2015 as well as with the implementation of the EKAER monitoring system in 2015 (MfNE, 2016).
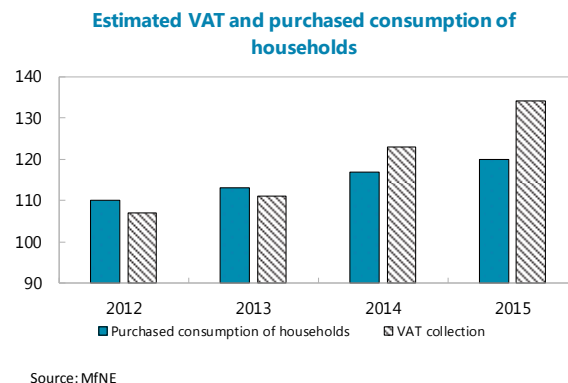
20.   The estimated VAT compliance gap has, therefore, decreased markedly since 2013, but remains at elevated levels. Based on the European Commission (2016), it is assessed that the VAT gap (defined as a difference between the theoretical tax liability and actual VAT revenue) was stable at around 22 percent of the theoretical liability between 2010 and 2013. It then shrank by 4 percentage points in 2014, and has most likely shrunk further in 2015 (MfNE, 2016). While being reduced, the level of the gap is still significant compared to other EU countries. Estimated at above 15 percent, it is markedly higher than the 10 percent EU average. This level is, however, lower than many of Hungary's regional peers.
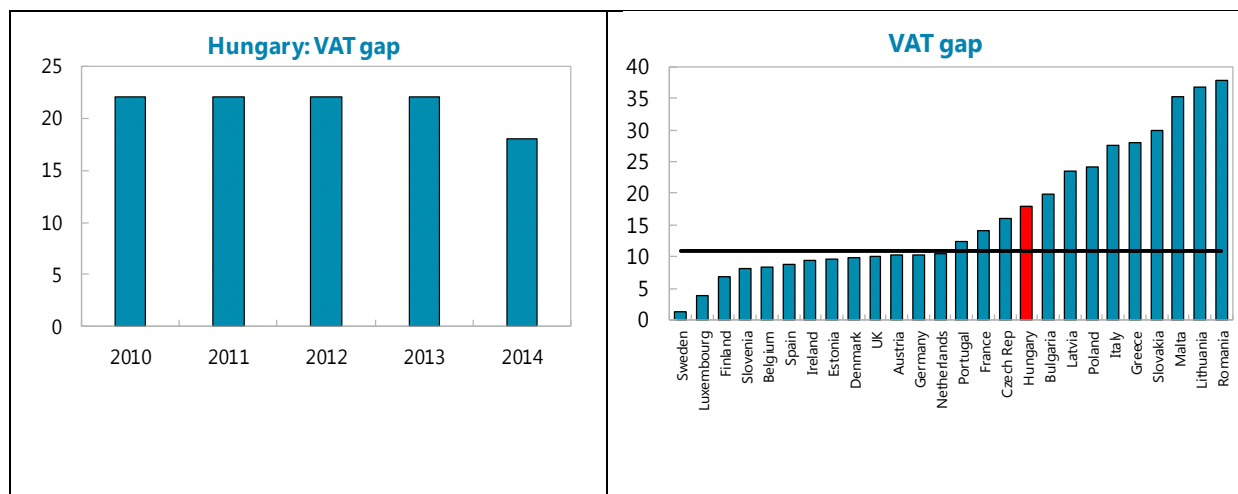
Source: European Commission (2016)

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[8] VAT is estimated to have slightly reversed to around 9.5 percent in 2016, which can be attributed to lower absorption of the EU funds and the introduction of reduced rates on selected items.

21.   Policy simulations point to a high dividend from further reducing the VAT compliance gap. Higher VAT revenue would lead to lower deficits, and thus lower debt stock and cost of financing. Consequently, an increase in VAT revenue would reduce the stock of debt more than proportionally in the steady state. Under the assumption of gradual elimination of the gap over next five years, the primary balance would strengthen from around 0 percent to around 2 percent of GDP, the overall balance would improve from around -2.5 percent to almost a balanced budget, and public debt would decline to around 62 percent of GDP.
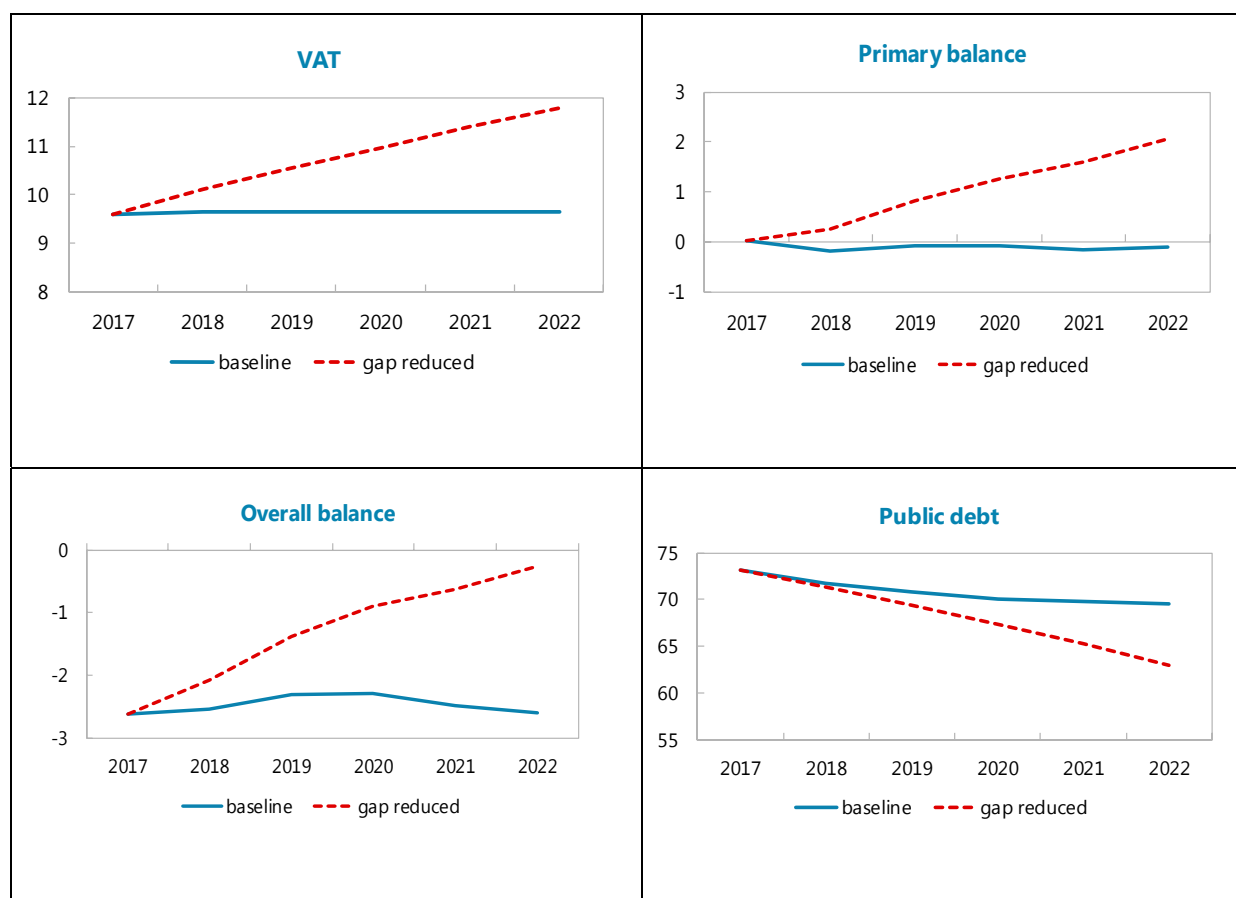
Source: Staff simulations

D.   Conclusions

22.   Improving tax compliance can be key in shifting segments of the grey economy into the formal sector. Although the grey economy in Hungary has been shrinking and is at par with peers, it remains sizeable. Tax noncompliance and undeclared work are one of the main drivers of the grey economy in Hungary. The authorities have embarked on a comprehensive strategy to improve tax compliance following the global financial crisis. This strategy has already yielded sizeable gains and VAT collection has improved in recent years. Consistently with this, the VAT gap estimates point to the reduction in the gap, coinciding particularly with the implementation of the online cash registers and the electronic system monitoring the road transport of goods movement.

23.   Mobilizing additional VAT collection would help lower the fiscal deficits, which would translate into lower debt and financing cost. Simulations suggest that eliminating the VAT gap would reduce the overall deficit by around 2 percentage points and public debt by around 8 percentage points, reducing the exposure to shocks and creating fiscal space for other initiatives.

24.   Efforts to shift more of the grey economy to the formal sector should be multi-faceted. In addition to strengthening tax administration, it is also important to streamline regulations and improve the business environment in general in order to support the effort to increase tax compliance as well as to facilitate productivity gains and boost growth and job creation.

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THE PUBLIC WORKS SCHEMES IN HUNGARY: ACHIEVEMENTS AND POLICY CHALLENGES[1]

The Hungarian authorities have taken several measures to boost employment, including through Public Works Schemes (PWS). Hungary's PWS are very large and were mainly used to maintain public buildings and infrastructure. PWS, part of a counter-cyclical toolset, helped lower the unemployment rate and provide some training to low-skilled labor. The expansion of PWS has also helped reframe the social benefit system on a contributive mode, and facilitated reforming and scaling back the old system, which had high fiscal costs. Unemployment substantially declined in recent years and severe labor shortages have emerged at all skill levels. Reforming the PWS to enhance training and encourage its participants to move to the primary labor market will help ease labor shortages and boost growth.

1.   **The magnitude of PWS in Hungary is very large** (Figure 1). In 2016 PWS employed about 223,000 workers (5.0 percent of the labor force). The cost of PWS amounted to HUF 340 billion in 2016 (1 percent of GDP) and constituted 70 percent of the cost for all active labor market measures.[2] PWS initially expanded in a context of weak growth and targeted long-term unemployed persons with low skills and limited geographical mobility. Around 83 percent of PWS workers have low or no professional skills.

2.   **PWS primarily served as social safety nets, supporting vulnerable households.** Hungary's unemployment benefits have been limited, as the government reoriented an important part of active labor market policies and social protection strategy to focus on PWS.[3] The average monthly PWS wage is about €160—less than the minimum wage but above the welfare entitlement. The initial 12-month contract can be extended with an additional 6-month contract with the same public employer, but workers may change employers and remain in PWS for years. PWS workers usually perform labor-intensive low-skilled physical labor in public infrastructure and maintenance—construction, drainage, agriculture and farm work, and street cleaning.[4]

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[1] Prepared by Michelle Hassine. This SIP benefited from comments from participants at a seminar organized at the Magyar Nemzeti Bank (MNB) on March 7, 2017 as well as discussions with representatives from the Ministry for National Economy, the Confederation of Hungarian Employers and Industrialists, and the Hungarian Chamber of Commerce. The author wishes to thank Ms. Anna Adamecz-Völgyi (MNB) for her useful comments.

[2] Data are from
http://kozfoglalkoztatas.kormany.hu/download/6/79/a1000/Havi%20t%C3%A1j%C3%A9koztat%C3%B3_2016_okt.pdf

[3] The unemployment benefit is 60 percent of the last average pay but cannot be higher than the minimum wage. Since 2011 jobseekers receive an unemployment allowance for a maximum of 90 days, the shortest jobseeker allowance in the EU. After the 90 days period, they become eligible to participate in the PWS.

[4] Data on labor market policy in the EU are available from http://ec.europa.eu/eurostat/web/labour-market/labour-market-policy/database.

3.   A relatively small ratio of workers has transitioned from PWS to the primary job market. PWS have thus succeeded more in providing social assistance, that entailed some production and training, than in rapidly improving employability (Table 1). Statistics show that 11-13 percent of PWS workers exit every year and get a regular work contract. About a quarter of PWS workers receive some form of training.[5] However, some studies found that a continuous participation in PWS tends to reduce the odds of finding work on the primary job market.[6]

4.   PWS substantially contributed to boosting employment. In 2015, Hungary reduced its unemployment rate to its 2006 level, while increasing the employment rate by 7 percentage points. However, up to 2013 the expansion of PWS took place on the back of some contraction in employment in the private sector. Given their lower wages, and in some cases, part-time work, the average earnings of fostered workers reach only about a third of the average wages of primary job market participants.

5.   The direct fiscal support to PWS increased gradually, reaching 1 percent of GDP in 2016. During 2011-16, the fiscal cost increased fivefold, while the number of participants more than doubled. This suggests more expensive programs, not least because more participants shifted to a full-time schedule, from about only a quarter of them in 2011.

	2011–16 Public Works Schemes – Fiscal Costs 1/						
Year	Monthly average number of participants		Total fiscal spending	of which direct compensations to workers	Total fiscal spending	of which direct compensations to workers	Fiscal cost per participant (annual)
	In thousands	In percent of total labor force 1/	Billion HUF		In percent of GDP		in thousands HUF
2011	75.8	1.8	59.8	48.7	0.2	0.2	788.8
2012	92.4	2.2	131.9	101.1	0.5	0.4	1427.3
2013	126.7	2.9	171.1	138.9	0.6	0.5	1350.8
2014	178.9	4.1	225.5	153.0	0.7	0.5	1260.8
2015 2/	208.1	4.6	270.0	236.6	0.8	0.7	1297.3
2016 2/	218.0	4.8	340.0	191.9	1.0	0.5	1559.6
Changes							
2011-16	142.2	3.0	280.2	143.2	0.8	0.4	770.8

Sources: Ministry for National Economy (MfNE), HCSO; and IMF staff calculations.
1/ HCSO, Tables 2.1.2.2, 2.1.59
2/ Based on the budgeted amounts.

6.   In addition to their direct fiscal costs, PWS are creating future pension liabilities. PWS workers contribute to the state pay-as you go pension at the same rate as regular workers. However, their contributions are based on lower incomes, suggesting that when large PWS cohorts apply for

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[5] *The Hungarian Labour Market*, 2015.

[6] See Fruzsina (2015).

pension, state-funded payouts would need to compensate for the discrepancy.[7] In particular, even short-term contracts (30 days) open rights for social security, which could be a key motivation for participating in public works. However, it is important to note that in the absence of PWS, the fiscal costs associated with the need to offer PWS participants social support would be significantly higher, reaching about 1.2 percent of GDP.[8] However, it is important to note that the latter amount does not include eventual future fiscal cost to fill any pension funding gap for the PWS workers.

7.   **The aggregate contribution of PWS to growth is difficult to estimate but could be significant.** PWS directly support incomes and thus domestic demand as PWS workers have a high propensity to consume. While this would be the case also for jobseekers receiving unemployment benefits, PWS workers are three times more numerous than those receiving unemployment benefits.[9] Their income is also 2½ times higher than those on unemployment benefits. Accordingly, PWS programs contribute to GDP through boosting consumption as well as production.

Policy Challenges Related to Large PWS

8.   **Notwithstanding their achievements highlighted above, PWS can create various challenges, which include the following:**

- **Large PWS could create some distortions and labor misallocation.** PWS could encourage labor-intensive activities. Ample job offers in low-paying low-skilled positions may discourage the formation of human capital by encouraging school dropouts and insufficient education for new entrants to the job market. These factors may contribute to reinforce labor market polarization, hence entrenching rigidities and hysteresis. PWS could also be discouraging labor mobility and thus contribute to sustaining shortages in the booming regions.

- **PWS could contribute to upward wage pressures.** PWS would tend to add to wage rate pressure if they remove a substantial part (in the case of Hungary about 5 percent) of the labor force from the primary job market's bottom pay scale. In a tight labor market, even for unskilled workers, a narrow contingent of available workers at the base of the workforce pyramid would lead to rapid increases in minimum wages, which can in turn reverberate upwards. This would have adverse implications for the unit labor costs (ULC) and competitiveness.

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[7] Fostered workers are subject to personal income tax (16 percent), social security contributions for their pension (10 percent), health insurance (7 percent), and unemployment insurance (1.5 percent). Employers pay their share of social security (13.5 percent) as well as a contribution for vocational education (1.5 percent).
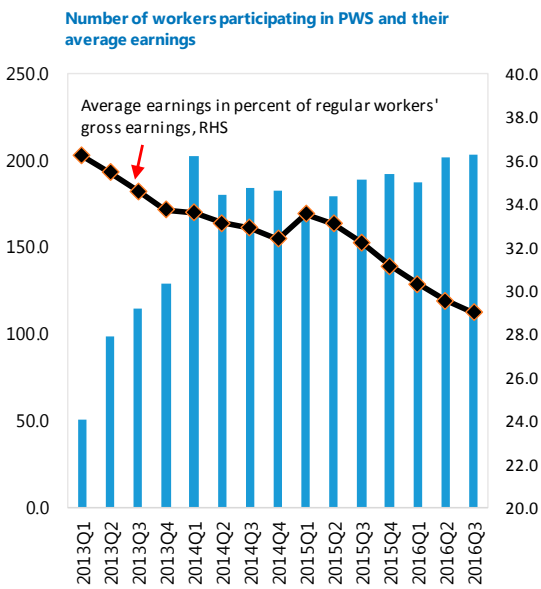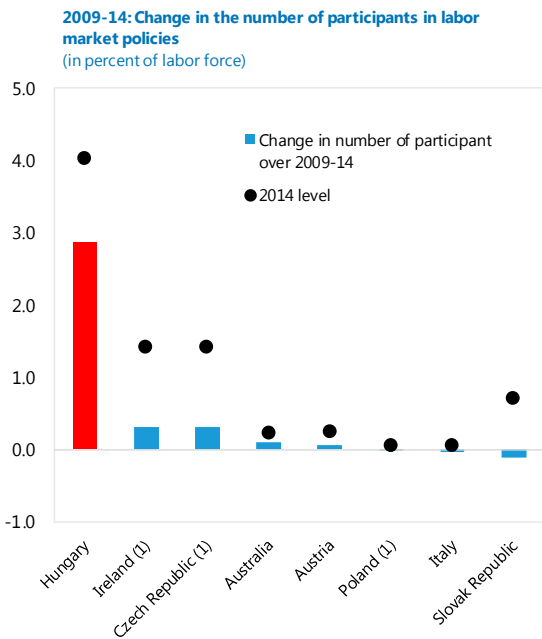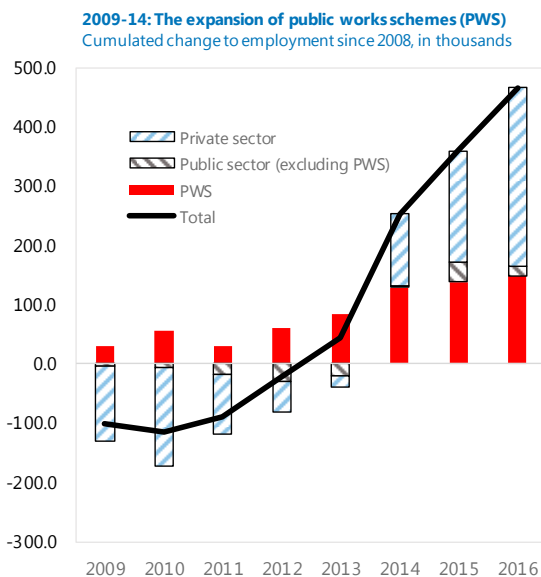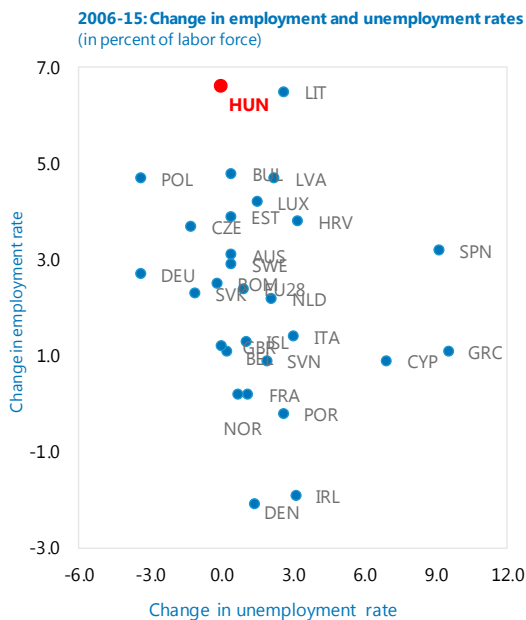
[8] This estimate assumes that the budget-funded unemployment benefit would be served to all the unemployed (regardless of the unemployment period) and to PWS participants.

[9] In 2016 the number of registered unemployed was 299,000, amounting to 6.6 percent of the labor force, out of which only 1.6 percentage points was eligible to unemployment benefits.

- **The success of PWS is contingent on good management and governance.** There are some reports of misallocation of participants in PWS in redundant programs. In addition, critics have pointed out that PWS do not produce significant value added or provide adequate training. Furthermore, EU reviews conclude that the relevance of PWS in facilitating a return of the unemployed to the primary job market is not yet demonstrated. [10]

- As mentioned above, **a large scale PWS program could increase fiscal liabilities in the long term**. If insufficient resources have not been created in pension funds, the state budget would have to fill the gap.

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[10] See European Commission (2013), chapter 4.

Figure 1. Hungary: Public Works Schemes

2006-15: Change in employment and unemployment rates
(in percent of labor force)

2009-14: The expansion of public works schemes (PWS)
Cumulated change to employment since 2008, in thousands

2009-14: Change in the number of participants in labor market policies
(in percent of labor force)

Number of workers participating in PWS and their average earnings

Source: Eurostat, December 2016; Hungarian Central Statistical Office, Labour Market Statistics; OECD LMP database; and IMF staff calculations.
(1) Data for 2013 only.

Table 1. Pubic Work Schemes in Selected Countries

	Hungary	Poland	Slovak Republic	Nordic countries
Share of PWS in total LMP participants 2014, in percent 1/	75.8	2.0	28.3	Finland 17.6 Sweden, Denmark, and Norway: 0
Share of PWS in total LMP expenditure, 2014, in percent	62.0	1.8	2.5	Finland 4.4 Sweden, Denmark, and Norway: 0
Cost (2014, in percent of GDP)	0.7	0.01	0.01	*Finland:* 0.01 *Sweden, Denmark, Norway*: 0
Funding sources	Fully from central government (CG) budget	1/3 from employers contributions, rest from CG budget	Fully from CG budget	Principally from CG and local government budgets
Targeted population	Disadvantaged jobseekers, with at most seconddary level education, aged 18 to retirement age, who have been registered unemployed for at least 6 months; disabled persons.	Targeting low-employablility workers, in particular long term unemployed dependent on social assistance benefits.	Targeting low-employablility workers, in particular long term unemployed dependent on social assistance benefits.	*Sweden, Finland*: job seekers who have been outside the labor market for a long time.
Eligibility	Open to all registered unemployed.	Limited set of criteria including period of unemployment, limited qualification or work experience, and dependency on social suport.	Voluntary participation to recipients of minimum income.	Mainly based on time in unemployment.
Projects	Mainly maintenance of public infrastructure: construction, drainage, agriculture and farm work, street cleaning, and general maintenance.	Municipalities, community groups, NGOs and charitable organizations, and water companies.	Work defined in a general way: environment and emergencies, social and cultural, and education and community activities.	*Sweden:* Creating extra jobs within the welfare system, in particular in health care and education.
Duration	Capped at 12 months with the same organization; successive PWS contracts are possible with different entities.	Capped at 12 months, but participation is usually of 3-6 months.	Capped at 18 months; renewable after 6 months up to 12 months; 10-20 hours per week.	Usually capped at 6 months per participant.
Mechanisms to return to primary job markets	- Programs designed as a social safety net; they have limited impact on upgrading skills. - Training is available but not widely applied. - Monetary incentives: (i) PWS wage lower and declining in comparison with minimum wage; (ii) Incentive for finding employment (2016); (iii) additional support for transport and	- Employers are required to hire the worker for at least 3 months after the program is finished. - Preparatory training into work routine.	- Programs designed as a social safety net; they have limited impact on upgrading skills.	- *Finland:* various measures including training and temporary placement with potential employers. - *Norway:* Wage subsidy to employers focusing on hard-to place unemployed. - *Sweden:* social employment with employer subsidies under various forms.
Funding	Public support covering 100 percent of the wage costs; Participants receive the wage-replacement benefit and do not stay on the unemployment register.	One third from employers' contribution, and the rest from state transfers.	Partial government subsidy, with backing from the European Social Fund.	*Sweden:* by the employer, with a subsidy capped at 85 percent of wage cost within a limit; workers are paid according to the prevailing collective agreements.
Social security and pension benefits	Full insurance for health, accidents, and unemployment.	Full insurance for health, accidents, and unemployment.	Time in PWS does not count as work period; claimants are entitled to health benefits but not to pension benefits.	Full insurance for health, accidents, and unemployment.

Sources: The Hungarian Labour Market 2015; EU Commission Public Works (2013); OECD database; Eurostat; and IMF staff calculations.

9.   **As labor shortages intensified, the authorities have been increasing the incentives to transition to the primary job markets.** They plan to gradually reduce the number of participants to 150,000 (about 3.4 percent of labor force) by 2020 and limit the total period of participation for workers to 12 months. In January 2016, a new allowance was introduced for active job searching. However, not to incentivize a prolonged stay in PWS, fostered workers who move to the private sector would continue to receive this allowance for the remaining normal term of their PWS contract. In 2017, the 15 percent increases in the minimum wage for unskilled workers was accompanied by only 3 percent increase in PWS wages to raise the incentive to find a job in the private sector. [11]

10.   **Further measures could be considered to accelerate the transition to the primary job market. These measures include**:

- **Enhancing training.** Vocational training would help increase the productivity of PWS workers and increase their capacity to earn an income after their exit. Reportedly, even basic education is needed for many of the current participant in PWS. In 2015, around 53 percent of all PWS workers had an education at or below primary school.

- **Easing the transition to the primary job market through portable social benefits and limiting incident costs when leaving the PWS.** PWS participants could be deterred by a transition that would create other costs to them, such as for relocating or for transportation. Hence, extending some social transfers to partially offset additional costs associated with housing and transportation would improve the incentives to move to the primary labor market.

- **Creating joint ventures with the private sector.** The development of work experience and interactions with workers in the private sector could help increasing the employability of participants. Other ways to gain private sector experience and skills could in the form of internships and or apprenticeship programs.

Conclusion

11.   **Hungary's PWS have been successful in achieving their objectives but need to adapt to the evolving economic conditions.** PWS have succeeded in reducing unemployment and helped support domestic demand during the recovery from the deep economic crisis. The PWS directly targeted the poor, and thereby reduced their vulnerabilities and risk of social exclusion. They played a significant role in backing the development of rural areas and maintaining public infrastructure. Looking ahead, it would be important to adapt the program to Hungary's current economic situation. There is a pressing need to better train PWS participants and incentivize their transition to

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[11] Hungary has two types of minimum wages. The *national* minimum wage applies to workers without professional qualification or whose skills are not relevant to their position. The *guaranteed* minimum wage applies to skilled workers who have a level of education required for their position. Reflecting more acute labor shortages in skilled workers, the increase in their minimum wage was higher (25 percent) to foster interest in training and education.

raise supply in the primary labor market to ease the severe labor shortages. This would be instrumental in improving potential growth. The recent reorientation of the program in this direction is a positive development. Success in this effort would also support the objectives of reducing the fiscal cost, while raising productivity and enhancing competitiveness.

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