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Italy: Selected Issues

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ITALY

Selected Issues

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Approved by the European Department

June 20, 2011

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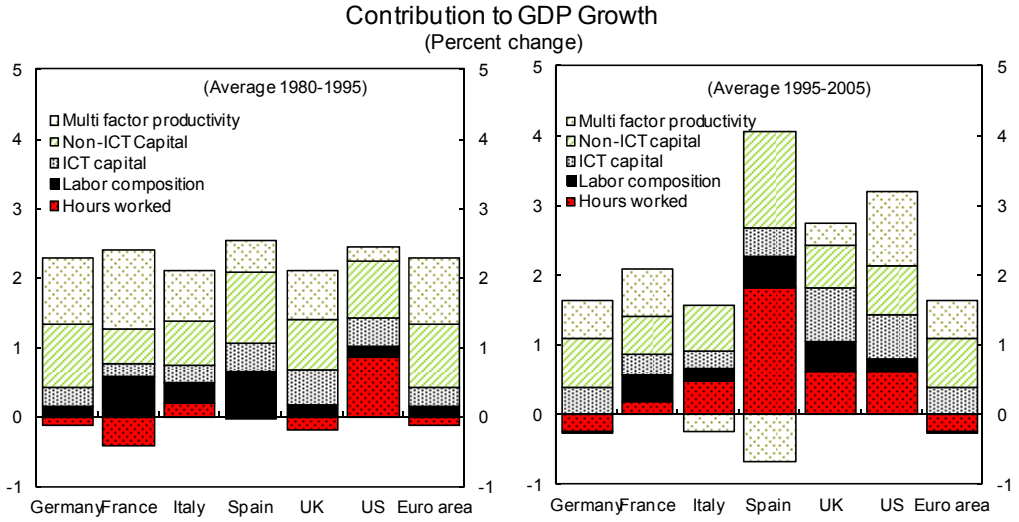
I. Structural Reforms And Growth: What Works?[1]

Based on the economic literature and international experience, this annex identifies the policy measures and institutions in product and labor markets that boost growth and employment. Evidence points to substantial long-term growth gains for structural reforms in Italy. Advancing structural reforms in key bottleneck areas can lift productivity, and substantially enhance growth potential. Measures could focus on pursuing further product market liberalization, reducing the labor tax burden- matched by expenditure cuts, promoting decentralized wage bargaining, and addressing labor market dualism. Labor and product market reforms are complementary.

A. Diagnosis

1. **In the last decade, Italy has suffered from low economic growth, weak productivity, and declining competitiveness.** Total factor productivity (TFP) has been sharply declining over the last decade, which has resulted in persistently rising unit labor costs, stagnating incomes, a widening competitiveness gap, and anemic growth. The weak productivity growth has been attributed to a number of structural factors, including: (i) policy and regulatory rigidities limiting competition and hindering the business environment; (ii) low efficiency, linked to the preponderance of small and medium-sized enterprises that are unable to exploit fully economies of scale; (iii) limited process and product innovation, hindered by labor market rigidities; (iv) the comparatively low level of education; (v) pervasive inefficiency in public expenditure; and (vi) the low-skill specialization pattern, given a production structure (especially in manufacturing) based on traditional products. This annex focuses on the role of product and labor market reforms in fostering TFP, growth, and employment.



Sources: EU Commission; and IMF staff calculations.

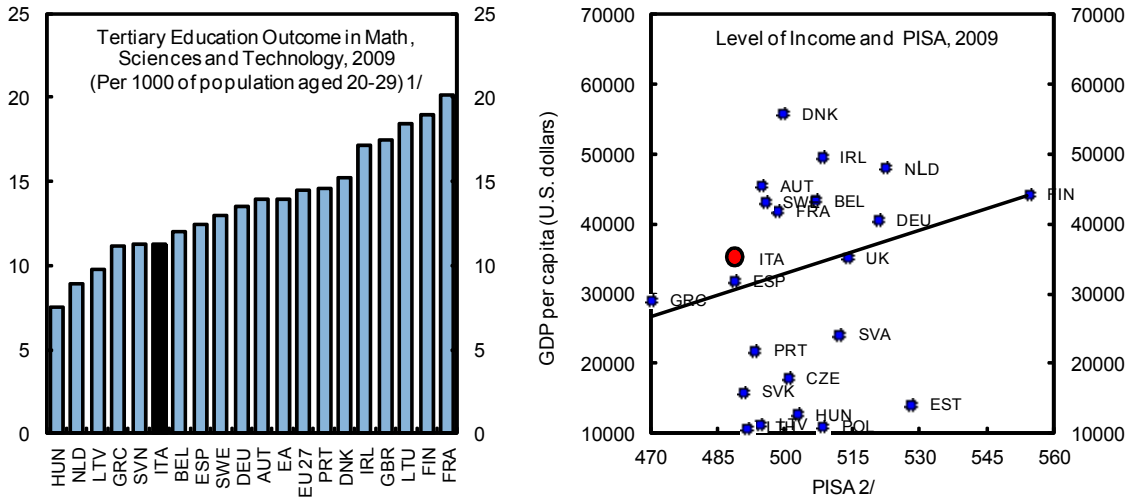
[1] Prepared by Hanan Morsy (EUR).

Box 1. Why is Italy lagging behind?

The weak growth performance can be attributed to a number of structural factors, including:

- **Low educational attainment and inadequacies in tertiary education**. The level of educational attainment in Italy is among the lowest in the OECD area. Only slightly more than 10 percent of the working age population has a tertiary degree compared with the OECD average of 26 percent. Despite high education expenditure per student, the average educational outcomes of a typical 15–year old Italian student are among the poorest according to the OECD PISA study.

Education attainment indicators point to Italy's lagging performance.



Sources: Eurostat; WEO; and IMF staff calculations.
1/ Data for Italy, Greece, EA, and EU 27 as of 2008.
2/ Comparing countries' and economies' performance on the math scale.

- **Excessive regulation.** In many areas, Italy's regulatory policy and practice lags far behind best practice in Europe and the OECD. Parts of the service sector remain highly protected from competition or encumbered with excessive regulation, sometimes varying across regions. Inefficiencies in public administration also add to the obstacles faced by the private sector.

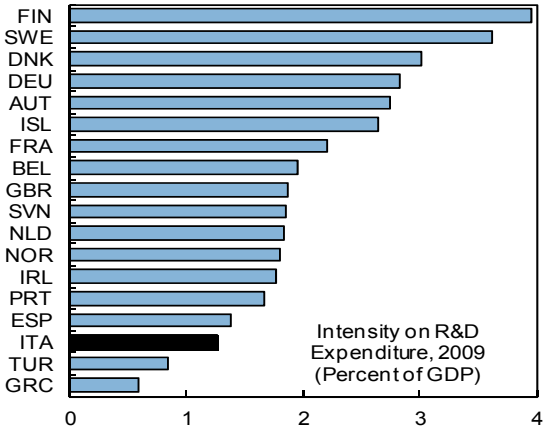
- **A predominance of small and medium-sized enterprises, which are unable to exploit economies of scale.** Owing to regulatory, corporate governance, financial, and cultural reasons, SMEs are predominant in Italy. Growing beyond a certain point, where family and close personal connections can no longer serve to enforce contracts requires a considerable increase in risk and costs of control. The traditional importance of personal or family control has also limited the use of non-bank SME financing. The equity markets remain underutilized as a source of SME financing and venture capital has also been slow to develop. Holding structures tend to obscure beneficial ownership and to give some insiders a degree of control that significantly exceeds their share.

- **The tax burden is one of the largest in OECD but public expenditure is very inefficient**, especially in the South.

Box 1 (continued): Why is Italy lagging behind?

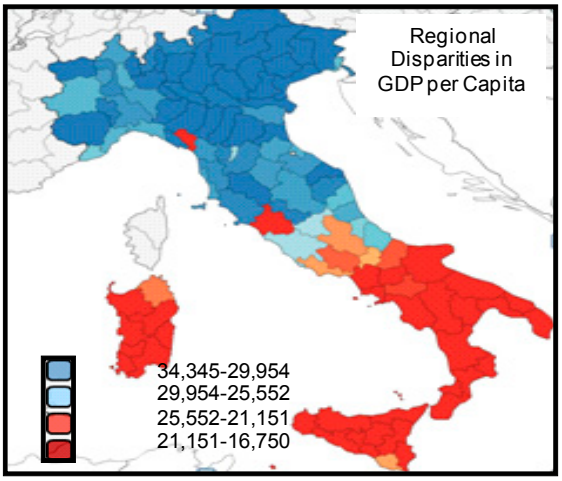
- **Weak judicial system**. Delays of civil justice are among the longest in all OECD countries. Courts are very slow to resolve cases. Incentives faced by lawyers tend to encourage longer trials: lawyers are paid for each judicial act, so they tend to multiply the number of acts they perform.

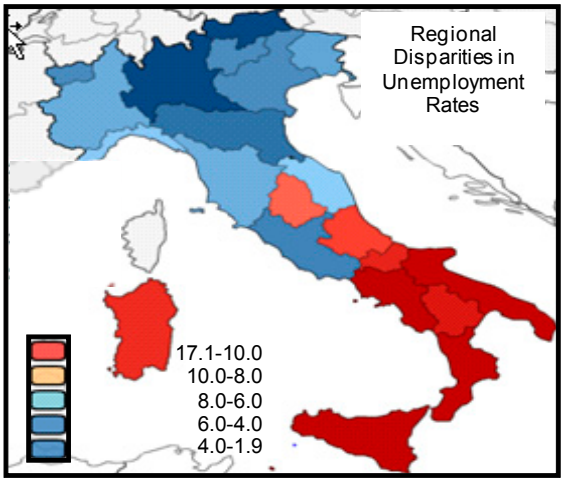
- **Scarce innovation and R&D activity.** Expenditure on R&D in Italy is slightly above 11 percent of GDP, compared with the OECD average of 2.3 percent. The small size of Italian makes it difficult to meet up-front cost of R&D. R&D in universities or research institutions is underdeveloped in Italy.



Source: OECD.

- **Regional divide.** Italy is characterized by large regional disparities in terms of per capita income as well as labor market performance, in particular between the developed Center-North and the lagging South. Per capita GDP in the South is almost half of that in the North, reflecting lower productivity and, more importantly, substantially lower employment rate disparities. Italy's coefficient of variation for the regional long-term unemployment rate is the highest among OECD countries, while its coefficients of variation for the regional youth unemployment rate and for the regional labor force participation rate are some of the highest (see Selected Issues II).





Source: OECD, TL23 and TL2 regional breakdowns.

2. **The competitiveness gap widened.** Economic rigidities, along with Italy's historic specialization in products with relatively low value added, contributed to a steady erosion of competitiveness. Italy's market share in world trade has declined significantly (and more than its peers) since the mid 1990s. Earnings growth outpaced the growth in labor

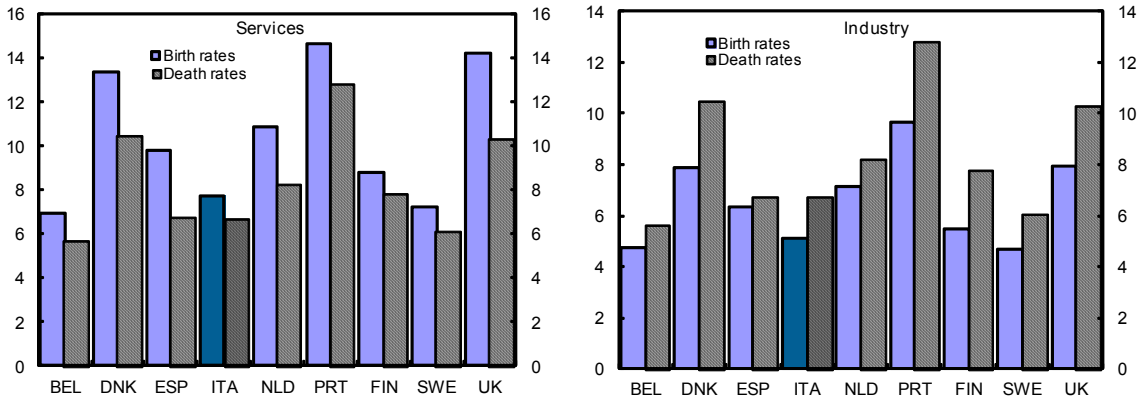
productivity over the last decade. As a result, Italy's unit labor costs grew by nearly 25 percent cumulatively during 1999–2007. The real exchange rate has steadily appreciated on account of moderately higher inflation and unit labor cost increases exceeding those of trading partners. The consumer price index, producer price index, and unit labor cost-based real effective exchange rate measures point to a loss of price competitiveness.

3. **Structural impediments hinder product market performance.** The high level of product market regulation hampers productivity growth and incentives for innovation. While the OECD's product market reform (PMR) indicators suggest that there has been considerable progress since the start of the EMU, the reform process has lost momentum since early 2000s. Compared to the other euro area countries (including France, Germany, Netherlands, and Spain), improvements were achieved, but Italy is still more heavily regulated than its peer countries on some accounts. The key remaining weaknesses are the high levels of public ownership, especially at the local level, regulatory barriers to competition, administrative burdens to startups, and constraining regulations for professional services (OECD 2009).

	Product market regulation			State control			Barriers to trade and investment		
	1998	2003	2008	1998	2003	2008	1998	2003	2008
France	2.5	1.7	1.5	3.8	2.9	2.6	0.8	0.6	0.5
Germany	2.1	1.6	1.3	3.2	2.1	2.0	0.7	0.8	0.7
Italy	2.6	1.8	1.4	4.2	3.1	2.3	0.8	0.7	0.7
Netherlands	1.7	1.4	1.0	2.5	1.9	1.7	0.5	0.4	0.3

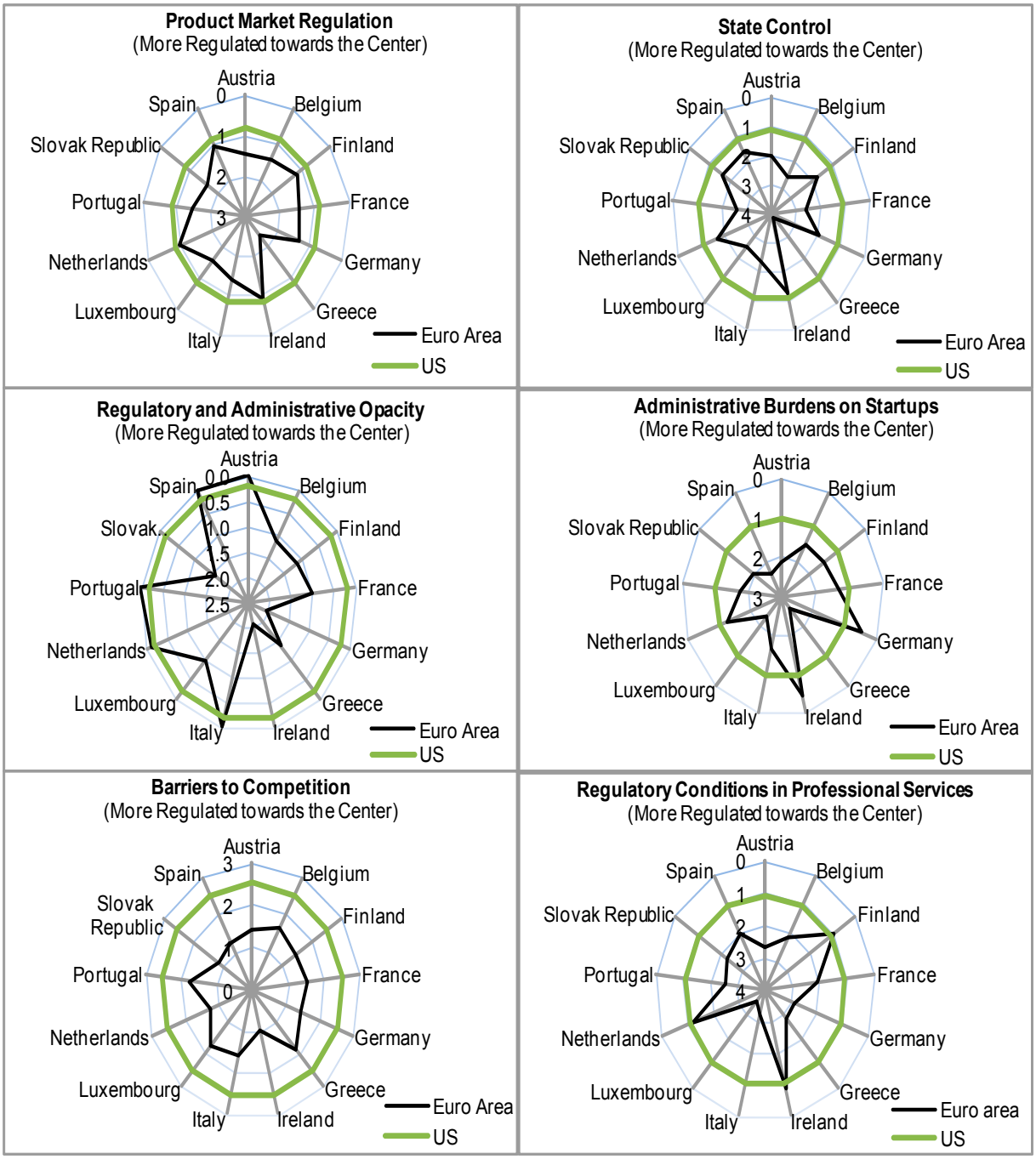
Source: OECD PMR database.

Italy: Business Demographics, Average 1998—2007



Sources: Eurostat; and IMF staff calculations.

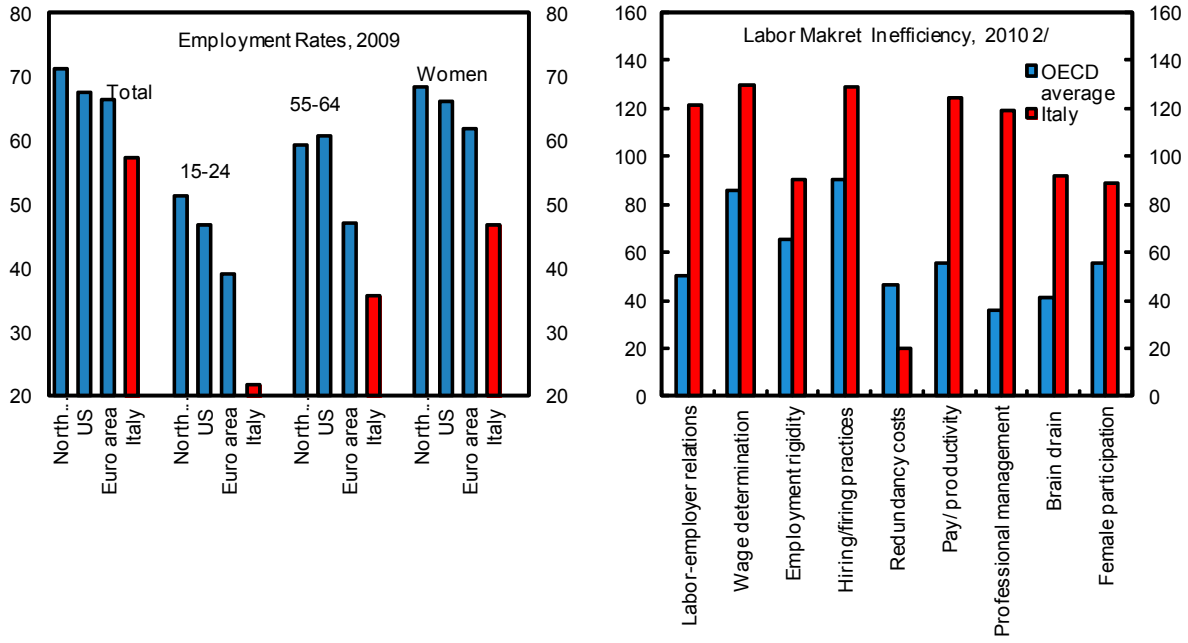
Figure 1. Structural Indicators for Product Market



Source: OECD.

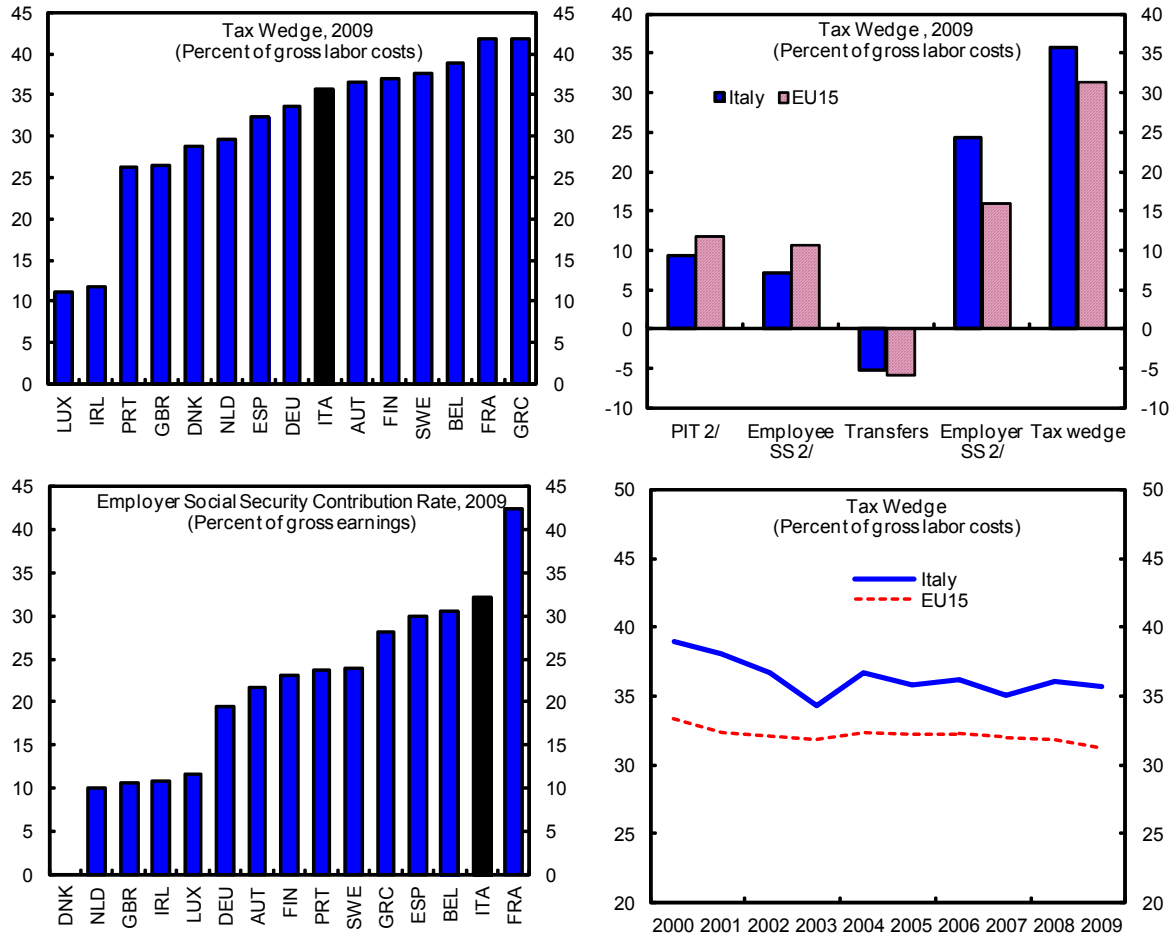
4. **Despite substantial improvements over the past decade, Italy's labor market performance still lags behind other European economies.** Employment rates continue to be substantially lower than those in most other European countries. Furthermore, employment rates vary strongly across socio-economic groups. While the employment rate of prime-aged males is often at or above 71 percent, the low employment rates of women, older workers, youth considerably reduce overall employment rates. Labor utilization varies considerably across regions. In addition, the tax wedge, especially for low-skilled workers, remains high (Figure 2) and depresses labor utilization.

Italy: Selected Labor Market Indicators



Sources: OECD; World Economic Forum, *The Global Competitiveness Report 2010-2011*;and IMF staff calculations.
1/ GDP-weighted average of Sweden, Denmark and U.K.
2/ Higher index denotes weaker performance.

Figure 2. Italy and EU15: Tax Wedge 1/



Sources: OECD; and IMF staff calculations.
1/ For a one-earner married couple at 100% of average earnings, with 2 children.
2/ SS stands for Social Security contributions and PIT for Personal Income Tax.

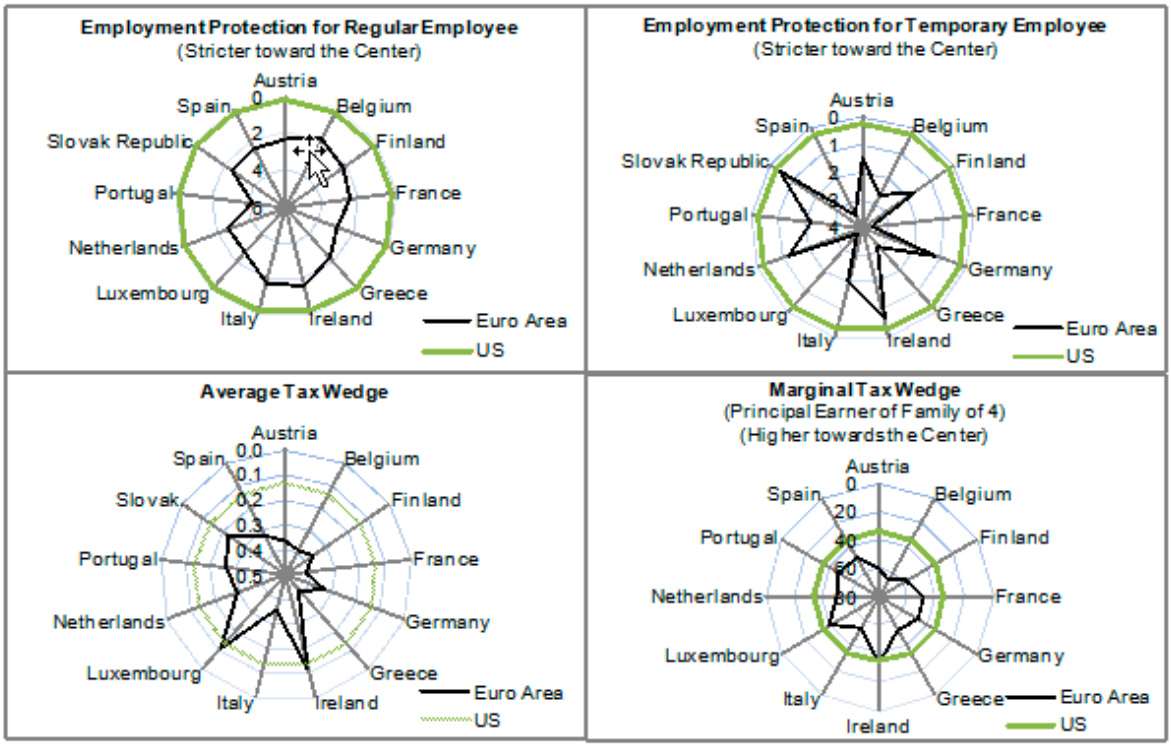
5. **Asymmetric polices have also exacerbated disparities in the labor market**. Italy's social safety net is generous for some workers, but virtually nonexistent for (most) others; the extent of the employment protection varies substantially across workers; and the aggregate wage distribution is too compressed. As a consequence, a rising share of workers faces high employment risk but little income insurance. The existing wage bargaining system also exacerbates these disparities: nationally bargained wages are less binding in the North, but too high for South, preventing sufficient spatial mobility to more quickly reduce regional disparities. There is also no general unemployment insurance.

B. Some Evidence from the Literature

Product Market Reforms

6. **The product market regulation affects resource allocation and productivity**. Such regulation encompasses the barriers to entrepreneurship, the constraints to business operations as well as red tape and administrative burdens. Removing entry barriers lowers the cost of doing business and enhances firms' productivity. Higher degree of market competition reduces the incumbent firms' market power and price mark-ups, and induces the exit of less productive firms. Therefore, a more competitive market can enhance the allocation of resources across sectors and firms within the same sector, productivity of existing firms, and incentives for innovation[2].

Figure 3. Structural Indicators for Labor Market



Source: OECD

7. **Cross-country evidence supports a positive long-run impact of competition-**enhancing reforms on growth and productivity. A number of studies establish a strong positive relationship between the effectiveness of competition policy and long-run growth (Dutz and Hayri, 1999; Nicoletti and Scarpetta, 2003). Salgado (2002), using a panel of 20 OECD countries for the period 1985–1995, shows that the impact of structural reforms on

[2] See Schiantarelli (2010) for a comprehensive survey of the literature on the impact of product market regulation on macroeconomic performance.

productivity may be weak or negative in the short run, possibly due to adjustment and learning costs. In contrast, he estimates the impact of product market reforms on total factor productivity growth to be between 0.2 and 0.3 percentage points a year in the long run. Bayoumi et al (2004) calculate that pro-competition product market reforms, which lower price mark-ups in the euro area to the US level, would increase output by some 8.6 percent (relative to its baseline level) in the long run.

8. **A more competition-friendly environment could also boost employment.** Nicoletti et al. (2001) provide empirical evidence in favor of a significant negative effect of anticompetitive product market regulation on employment in a panel of OECD countries, controlling for labor market policy and institutional factors. The results suggest that in some countries the product market regulatory environment may account for up to 3 percentage points of deviation of the employment rate from the OECD average. Bassanini and Duval (2006) highlight that product market reforms could boost female employment through three channels. First, excessive regulation restricts the supply and drive up the prices of services such as childcare and household services. Second, restricted opening hours of shops make it difficult for women to reconcile work and family life. Third, product market reforms could foster the expansion of service sector where female employment is concentrated.

9. **In particular, enhancing competition through facilitating entry or the threat of entry stimulates productivity growth**. This generally occurs through two main channels, namely external and internal restructurings. In the external restructuring, eliminating barriers to entrepreneurship reallocates resources among firms. Low productivity firms exit the market and are replaced by new entrants, with the more efficient firms surviving. Consequently, a change in market shares among incumbents will increase sectoral productivity growth. At a firm level, free entry and exit can spur internal firm restructuring, known as "within effect," through organizational change, adoption of new technologies, R&D activities, and more efficient allocation of factors of production. Nicoletti and Scarpetta (2003) demonstrate that entry liberalization lead to productivity gains over a ten years time horizon in all of the OECD countries considered regardless their position in terms of technology adoption. In addition, they estimate that entry liberalization in service industries boosts annual aggregate TFP growth by about 0.1–0.2 percentage points in countries like Portugal, Greece, and Italy.

10. **Firm level evidence confirms substantial productivity gains of reforms aimed at facilitating entry and exit of firms**. Disney et al. (2003) find that entry, exit, and the reallocation of market shares (external restructuring) account for 50 percent of labor productivity growth and 90 percent of TFP growth for the UK manufacturing sector during 1980–1992. Similarly, Bartelsman et al. (2003) establish that entry and exit contribute 20 to 40 percent of aggregate productivity growth. And excessive administrative regulations of entrepreneurial activity have a strong negative impact on firm entry and this effect is even larger for small and medium sized firms. Cincera and Galgau (2005) estimate that a 1 percent increase in the entry rate leads to a contemporary increase in output, employment and labor

productivity growth rate of 2.2 percent, 2.7 percent, and 0.6 percent respectively and that a 1 percent increase in exit rate reduces output growth rate by 0.8 percent (one year lag), while increases labor productivity growth by 0.7 percent (2-year lag).

11. **Simulation-based quantifications suggest that reducing administrative costs translate into higher productivity**. Tang and Verweij (2004), employing a general-equilibrium model, estimate that reducing the administrative burden by 25 percent leads to a 1.7 percent increase in EU real GDP in the long run, reflecting higher capital accumulation and R&D spillovers. Likewise, the European Commission (2006) indicates that a 25 percent reduction in the red tape in the EU pays off in a 1.4 percent increase in real GDP in the long run.

12. **Reducing government ownership can also have positive effect on growth**. The state-owned firms are usually less efficient due to misaligned incentives and soft budget constraints. Nicoletti and Scarpetta (2003) estimate that a gradual reduction of the share of state-owned firms to the OECD-wide average increases annual MFP productivity growth by about 0.7 percentage points in the European countries that have a large stake of government-controlled business activities, such as Finland, Greece, Austria, France, and Italy. Alesina et al (2005) show that deregulation and privatization have similar positive effects on firm investment.

13. **Evidence shows a non-linear impact of the product market reforms on innovation**. Aghion et al. (2002) find that productivity growth of incumbent firms reacts more positively to entry in industries close to or above the world technological frontier and establish an inverted U relationship between competition and innovation. Griffith et al (2006) confirm that competition increase innovative activity by incumbents, but it decrease incentives for new firms to enter into the innovation process. However, within an industry, the effect of increasing competition on innovation is larger in countries that are closer to the global technological frontier.

Summary of Empirical Studies on Effects of Product Market Reforms

Study	Sample / time	Highlight of the results
Aghion et al. (2002)	British firms 1987–1993	Productivity growth of incumbent firms reacts more positively to easing entry barriers in industries where firms face similar production costs.
Bayoumi et al. (2004)	Euro area and US	Product market reforms reducing the price mark-up in the euro area to US levels leads to a GDP level increase in the euro area of 8.6 percentage points (relative to its baseline level) in the long run.
Cincera and Galgau (2005)	9 EU countries 1997–2003	Product market reforms increasing the current firm entry rate by 1 percent lead to a contemporaneous increase in labor productivity by 0.60 percentage points and an increase in employment growth by 2.67 percentage points.
Griffith and Harrison (2006)	12 OECD countries 1974–1999	There is an inverted U shaped relationship between R&D spending and the mark-up, with a few countries, including France, Italy, and the Netherlands on the downward sloping section. For these countries, an increase in competition would spur innovation.
Nicoletti and Scarpetta (2003)	23 industries in 18 OECD countries 1984–1998	Reduction of state ownership to the OECD-average level increases annual TFP growth by 0.7 percentage points in countries that have large state-controlled business activities. Entry in service sector boosts TFP growth by 0.1–0.2 percentage points in selected countries.
Salgado 2002	OECD countries 1985–1995	Product market reforms contribute an increase of 0.2–0.3 percentage points in total factor productivity growth in the long run, while being weak in the short run
Tang and Verveij 2004	EU countries	A reduction of 25 percent in administrative burdens in the EU would lead to a real GDP level increase of 1percentage point in the short run and 1.4 percentage points in the long run.

Labor Market Reforms

14. **Labor market policies and institutions influence employment and growth**. This section focuses on evidence for labor market features that are most relevant to Italy. These encompass the design of the tax system, employment protection legislation, and wage bargaining system. Taxes that raise the total labor cost reduce labor demand and employment. Also, high tax wedge can create disincentives to work in some segments of the labor market (low-skilled persons and second earner in a couple), reducing the potential labor supply. Stringent labor market regulation can decrease the speed of adjustment in response to demand or technology shocks, reduce the incentive for firms to innovate, and slow down the labor allocation process to its most efficient use. For instance, employment protection legislation strengthens the bargaining power of insiders compared to outsiders, implying that the responsiveness of wages to economic conditions might be lowered. Wage bargaining system could undermine employment performance if they result in an average wage level that is too high relative to productivity; or in a compressed wage structure which does not adequately reflect differences in productivity between workers and regions.

15. **Cross-country analysis confirms that a lower labor tax wedge reduces unemployment and yields long-run growth gains**. Labor tax burden comes out significant in most studies that analyze the impact of labor market institutions on macroeconomic performance. Bassanini and Duval (2006) find that higher labor taxes raise unemployment, with a 10 percentage point reduction of the tax wedge lowering the equilibrium unemployment by 2.8 percentage points and increasing the employment rate by 3.7 percentage points. They also report a rise of 1 percentage point in tax wedge leading to a decline of 0.05 to 0.2 percentage points in female full-time employment rate and of 0.14 to 0.42 percentage points in the female part-time employment rate. In terms of the effect of labor tax changes on potential output, Barnes et al. (2011) find that reducing the average tax wedge by 10 percent raises long-term growth by 2.1 percent in an average OECD country. The European Commission (2010) estimates that a one percent tax shift from labor to VAT would eventually raise potential output by 0.3 percent.

16. **Evidence highlights the adverse effects of a high level of employment protection legislation (EPL) on the employment of disadvantaged groups**. EPL could reduce job creation and destruction as a result of higher labor adjustment costs for employers. Empirically, the impact of EPL on the aggregate unemployment rate is ambiguous. Elmeskov et al. (1998) and Boeri et al. (2000) find a positive effect in some of their estimated equations, while Nickell (1997) and Nickell et al. (2005) find no significant effect. In general, the negative impact of EPL on the aggregate employment is not robust (Mourre, 2006). In contrast, the results are more robust when it comes to the employment of workers from groups at the margins of the labor markets. Bassanini and Duval (2006) report that one point rise in EPL leads to a decrease of 1.5 in full-time female employment rate, and to a decline of 2.35 in youth employment (5.4 when controlling for minimum wages). In Barnes et al. (2011), a 10 percent reduction in EPL leads to a long-run increase of 0.6 percent in GDP per capita in an average OECD country.

17. **The relaxation of restrictions on temporary employment alone accentuates labor market dualism**. Easing EPL only for fixed-term contracts strengthens the power of permanent workers in wage bargaining, which could potentially raise wage mark-up. "Insiders" on permanent contracts can raise their wage claims as they may feel more sheltered from job losses. The resulting negative effects on employment will be borne mainly by the "outsiders" who work on temporary contracts, raising inequalities and possibly reducing the responsiveness of wages to shocks. Blanchard and Landier (2002); and Cahuc and Postel-Vinay (2002) argue that such asymmetric reforms increase unemployment and decrease welfare. Additionally, deregulated temporary contracts can have an adverse impact on human capital formation as the increase the turnover of the workforce reduces the incentive of employers to supply adequate level of training to staff in temporary contracts.

18. **More decentralized wage bargaining boosts the employment for the groups "at the margin" of the labor market**. Coordinated bargaining entails greater wage

compression, with negative effects on relative employment, especially at the bottom of the wage distribution (Blau and Kahn, 1996). Centralized wage bargaining institutions tend to raise the relative wages of the young and less-educated and to lower employment for these groups (Kahn 2000). Wage compression also modifies the industry distribution of employment, shifting employment away from industries with low wages (Davis and Henrekson, 2000), and can exacerbate regional employment disparities. Bertola et al. (2002) highlight that centralized wage-bargaining together with a high degree of unionization lowers the female employment rate, while preserving a high employment rate for prime-age men, as the unions tend to negotiate large wage premiums for those with high opportunity cost of employment. The European Commission (2010) estimates that wage mark-up reductions would have significant positive impact on long-run growth. Eichengreen and Iversen (1999) contend that as growth becomes increasing reliant on rapidly changing, science-based, skilled-labor-intensive technologies, and countries with centralized wage bargaining will have to move further in the direction of decentralization.

Summary of Empirical Studies on Effects of Labor Market Reforms

Study	Sample / time	Highlight of results
Barnes et al. (2011)	OECD countries	A 10 percent reduction in average tax wedge raises potential growth by 2.1percentage points. A 10 percent reduction in EPL leads to a long-run increase of 0.6 percentage point in GDP per capita in an average OECD country.
Bassanini and Duval (2006)	21 OECD countries 1982-2003	A 10 percent reduction in the tax wedge lowering equilibrium unemployment by 2.8 percentage points and increasing the employment rate by 3.7 percentage points. A rise of 1percent in tax wedge leading to a decline of 0.05 to 0.2 percentage point in female full-time employment rate. One point rise in EPL leads to a decrease of 1.5 in full-time female employment rate, and to a decline of 2.35 in youth employment (5.4 when controlling for minimum wages)
Berger and Danninger (2005)	OECD countries 1990 to 2004	Low levels of regulation in the product and labor market are associated with higher employment growth. OECD countries with average regulation levels that move to low regulation levels stand to gain about 1 percentage point in annual employment growth, owing to spillovers from joint product and labor market deregulation.
Blanchard and Landier (2002)	France	The effects of a partial reform of employment protection by allowing firms to hire workers on fixed-term contracts may be perverse. The main effect may be high turnover in entry-level jobs, leading to higher unemployment.
European Commission (2010)	EU countries	A one percent tax shift from labor to VAT would raise potential output by 0.3 percentage point in the long-run.
Kahn (2000)	15 OECD countries 1985 to 1994	Centralized wage bargaining institutions raise the relative wages of the young and less-educated and to lower employment for these groups.

Complementarity between Product and Labor Market Reforms

19. **Product liberalization spurs more difficult labor market reforms**. When product market reforms erode rents and profit margins, incentives for workers to demand a share in those rents is weakened, lowering resistance to wage moderation and other labor reforms. Blanchard and Giavazzi (2003) argue that as product market deregulation decreases total rent, it can induce a decrease in the incentive of workers to appropriate the smaller rents, thus facilitate labor market deregulation. In their model, product market reforms take the form of an increased substitutability between goods. In the short run, such reforms lead to lower mark-ups, reduced unemployment and higher real wages. In the long term, however, this result is conditional on a reduction in barriers to entrepreneurship.

20. **Empirical evidence supports the reinforcing feedback between labor and product markets.** Nicoletti and Scarpetta (2005), and Bassanini and Duval (2006), among many studies in this area, point to strategic complementarities between labor and product market reforms. Estevao (2005) concludes that excessive regulation suppresses the beneficial effects of labor market reform on employment and output, by inhibiting competition or discouraging entry into the market. Berger and Danninger (2005) find sizable employment gains when labor market liberalization is accompanied with more competitive product market. A country moving from median levels of regulation to the lowest decile stands to gain 1 percentage point in annual employment growth, owing to spillovers from joint deregulation.

C. Lessons from International Experience

21. **Poor macroeconomic performance can generate structural reform momentum**. Output contractions and prolonged periods of slow growth spurred labor and product market reforms in several countries, including Ireland, the Netherlands, Canada, New Zealand, and the UK. For instance, New Zealand launched a sequence of structural economic reforms, triggered by a foreign exchange crisis in 1984. The crisis created a widespread recognition of the need for change; in addition the governing party parliamentary majority helped the government push the structural reform agenda with few constitutional impediments. Empirical evidence in Drazen and Grilli (1993), IMF (2004), and OECD (2006) suggest that the most promising time to reform is immediately after a crisis.

22. **Coordination among social partners facilitates reforms.** Unilateral reforms are more likely to be reversed than those negotiated with social partners. The active cooperation among key stakeholders achieves effective implementation. For example, reforms in Ireland and the Netherlands were based on consensus between social partners, trading wage moderation for labor tax cuts. Both countries set the stage for a long-run decline in the size of government and reduced tax wedges on labor income. The resulting employment gains came unambiguously from the private sector (Annett 2008).

23. **An effective communication strategy is key to ensure public support for reforms**. Tompson and Dang (2010) highlighted that government good communication was crucial to implement reforms (Italy: Dini reform; Germany and Spain: labor market; Netherlands: disability insurance). Consistent and coordinated communication efforts create public support for the reform and allow feedback from key stakeholders to further refine reform design. Clarity in communicating the reform goals and objectives can reduce the likelihood of reform reversals (Swedish: sickness insurance reform reversal in the 1990s). Moreover, communicating the costs of status quo (non-reform) would raise public awareness of the need for reforms.

24. **Government cohesion and "ownership" of reforms are key success factors.** The unity of the government behind reform is of crucial importance. According to Tompson and Dang (2010), in most cases where there was public conflict within the government or the governing party over a reform, the reform was eventually hindered. Many successful episodes are also characterized by clear "ownership" of reform initiatives. In a number of cases, reforms were clearly associated with identifiable individuals or institutions that assumed ownership and an interest in their success (France, Italy: pensions; Italy, Germany: labor market; Netherlands: disability insurance).

25. **Establishing an independent review and advisory body could foster reforms**. By providing independent and transparent policy analysis, such institutions can strengthen the quality of policymaking and help focus on priority areas. They can also neutralise vested interests, and build community-wide support by creating awareness of the costs of existing policies and the benefits from reform (Banks, 2010). Examples of these institutions include Australia's Productivity Commission or the Netherlands Bureau for Economic Policy Analysis.

26. **Co-operation of different levels of government matters for the success of structural reforms.**[3] Inter-governmental cooperation in policy-making is a key framework condition for reforms. Strengthening cooperation may have to be a part of the reform agenda, as it was in Australia in the early 1990s. Sub-national governments may serve as an impetus or an impediment to reforms. In three cases (Germany: retail; United States: welfare reform; Australia: electricity), sub-national governments played an important role in both advancing and designing the reforms eventually adopted. In contrast, the federal dimension sometimes complicated reform implementation (Germany: labor market), while in others resistance from sub-national governments impeded reforms (Spain: retail; Australia: water). Thus, involving sub-national governments in national-level reform debates and building wide-based consensus across different level of governments are crucial for ensuring successful reforms.

[3] Tompson and Dang (2010).

27. **There is no free lunch, reforms take time and can be painful**. Successful reforms generally took over two years to prepare and adopt, involving a considerable amount of careful study and consultation (Italy: labor market; United States: welfare reform; Australia: electricity), whereas many of the least successful reform attempts were undertaken in haste, often in response to immediate pressures (Tompson and Dang, 2010). In addition, structural reforms can be costly in the short-run and benefits take time to materialize. Country experiences, such as New Zealand and the UK, illustrate that reforms can take years and sometimes decades before translating into better economic outcomes. New Zealand experienced sluggish economic growth performance during the reform period. In the UK, reforms took some time to bear fruit as the unemployment rate remained elevated for almost a decade. Empirical cross-country evidence in IMF (2004) corroborates this conclusion.

28. **Comprehensive reform packages yield better economic outcomes than a "piece-meal" approach**. Utilizing the complementarities between fiscal consolidation and structural reforms enhances labor supply and improves macroeconomic performance. Annett (2008) highlight how the mix of fiscal, labor, and product market reforms complemented and reinforced each other in the case of Denmark, Ireland, the Netherlands, and the UK. These countries implemented labor and product market reforms simultaneously, while engaging in substantial fiscal consolidation. This finding is also consistent with evidence in Hobza and Mourre (2010), where reform gains were found to be considerably higher in the case of comprehensive reform packages than in the case of a "piece-meal" approach.

D. Required Actions: What Needs To Be Done?

29. **Structural reforms need to be prioritized on key bottlenecks**. On the product market side, remaining weaknesses in the business environment and competition policy framework hamper business activity and entrepreneurship. The regulatory framework still entails lengthy and costly procedures for enforcing contracts, dealing with licenses and starting a business; the overall administrative burden on firms is high and the degree of competition in services remains relatively low. On the labor market side, employment and participation rates of women, youth and older workers remain significantly lower than the euro area average, with large regional disparities. The tax wedge remains relatively high and depresses labor utilization. The existing wage bargaining system does not sufficiently reflect differences in productivity and cost of living, and thus exacerbates regional disparities. The asymmetric deregulation has tilted incentives for job creation toward temporary contracts, resulting in higher employment risk for an increasing fraction of the labor force and contributing to worsening productivity trends. According to Codogno and Felici (2008), despite Italy's progress in a number of these weakness areas, identified by the EU and the OECD, it was insufficient to close the gaps with the EU 15 average (Table 1).

30. **Studies have identified some key growth enhancing reform measures**. IMF (2010), the European Commission (2010), and Barnes et al (2011) pinpoint those product and labor market reforms that are the most effective in boosting growth. On the product market

side, the most promising reforms are those leading to the reductions in final goods market mark-ups (e.g.: services), the reductions in administrative burden and the increases in the skills of the workforce. Among labor market reforms, evidence suggest that the most efficient ones would be reducing average and marginal tax wedge, and shifting tax from labor to VAT.

31. **Potential productivity and output gains from further product market deregulation are promising**. Policies should ensure an efficient regulatory business environment and promote a higher degree of competition through further opening up of services and network industries, reducing public ownership especially at local level, and improving administrative efficiency. Stronger competition would allow new entries in the various sectors, fostering both innovation and efficiency, hence stimulating private investment and employment. IMF (2010) estimates that moving towards "best practices" (defined in terms of OECD PMR indices) raises overall productivity growth in the range of ¼ to over ½ percentage points per year. Similarly, Barnes et al. (2011) present evidence that a 10 percent reduction in overall product market regulations increases long-run growth by 3.8 percent. According to simulations in OECD (2009), aligning Italian regulatory standards to the 75th percentile of all EU countries in 2007 in all non-manufacturing could raise the level of productivity by about 14 percent over the next decade, with the largest gains expected from professional services reforms (7 percent).

32. **Lowering Italy's relatively high average tax wedge can boost employment and growth**. Italy has a relatively high tax and social security burden on labor income. Single taxpayers at average earnings end up with less than 55 percent of what they cost to their employer (total labor costs), meanwhile taxpayers at higher earnings get even less than 50 percent. The average tax wedge is about 10 percentage points higher than the OECD average.[4] Single-parents earning two thirds of the average wage faces the lowest tax wedge, which remains about 8 percentage points above the OECD average. Simulations by the European Commission (2010) and OECD (2009) find that reducing labor taxation, through shifting taxes away from the labor factor and toward consumption or reducing the average tax wedge, is among the most effective labor market reforms for lifting growth potential. According to Barnes et al. (2011), lowering the Italian average tax wedge to the OECD average would raise GDP per capita by 8.4 percent in the long-run, the highest potential growth gains for structural reforms in Italy based on their simulations. Reducing Italy's labor tax wedge over 10 years to the average level prevailing in the six OECD countries with the highest employment rate can deliver sizeable long-run employment gains of almost 4 percent (Bouis and Duval, 2011).

[4] Average tax wedge is calculated as the average income taxes plus employee and employer social security contributions minus cash transfers as a percentage of total labor costs.

33. **Promoting decentralization of wage bargaining could enhance the labor utilization and reduce substantially regional disparities**. Labor utilization remains low, especially among youth, the elderly, and women, and in the South. Evidence suggests that decentralization can especially benefit those underutilized groups "at the margin" of the labor market. Decentralized bargaining allows higher relative wage flexibility and leaves wider room for bargaining on working conditions more generally. It also makes possible the introduction of performance-related pay schemes where wages are used to motivate and improve workers' productivity. A decentralized system, which integrates regional differences in productivity and cost of living into wage setting, can reduce regional labor market imbalances. The government should adopt regionally differentiated wages in the public sector in order to reflect differences in cost of living. In light of high employment concentration in the public sector in the South, such reform can increase incentives for internal labor mobility and help reduce regional labor market imbalances.

34. **Policies should reduce labor market dualism**. Similar to some other European countries, Italy adopted some asymmetric reforms to increase labor market flexibility, by which regulations on temporary contracts were relaxed while maintaining strong employment protection for permanent workers. The time-limited nature of temporary contract reduces incentives for human capital investments and temporary employment creation tends to be in low-skill areas. Also, the still high protection of permanent contracts continues to make it difficult to lay off non-productive workers on permanent contracts. Consequently, the overall result has been a bias towards less-productive employment. Evidence also shows that a pervasive dual system, with a flexible temporary workforce and a highly protected permanent workforce, can actually increase unemployment (Blanchard and Landier; 2002; Jaumotte, 2010; and Dao and Loungani, 2010). Reforms to rebalance employment protection—with a view to support job creation—by relaxing protection on regular workers while enhancing it for temporary workers would be beneficial for reducing unemployment. Such reforms would create a more level playing-field for all workers and enhance social cohesion.

35. **The benefits of reform will take time to materialize.** Potential growth gains from addressing Italy's structural bottlenecks are sizable in the long term but uncertain in the short run. A bundle of reforms, if taken in parallel, can raise long-run growth in the range of 4 to 14 percent (Barnes et al, 2011; and OECD, 2009). However, estimated impact of structural reforms on potential output should be interpreted with caution. Simulations do not usually allow for a straightforward comparison across reforms types, complicating comparative assessment of their possible quantified effect on potential output. In addition, estimates do not fully take into account (i) upfront costs of reforms and therefore the short-run impact is uncertain, and (ii) the potential synergies and complementarities of different reform measures. IMF (2004) finds that the cumulative gains from structural reforms in the product and labor market areas are positive but they predominantly materialize in the long run. In the short term, the estimated output responses are small or even negative. The only exception is tax reforms where reform payoffs are substantial even in the short term.

36. **The required structural reforms are expected to have a positive long-term effect on public finances**. Regulatory reforms have no short-term fiscal costs and potential long-term gains. Competition enhancing polices and deregulation of professional services could raise corporate and labor tax revenues as a result of higher generated activities. On the other hand, the design of labor market reforms matters for their short-term budgetary effect. The reduction of average tax rates, if not matched by expenditure cuts, would reduce revenues in the short run, but will raise tax base in the longer run. A shift from labor to consumption taxation would not adversely affect public finances in the short term, assuming the same level of tax compliance across these two types of taxation. Other measures such as decentralization of wage bargaining, allowing differentiation of wage by regions and productivity, is likely to be budgetary neutral. Addressing labor market dualism by reducing EPL for permanent contracts will also have a neutral fiscal impact.

37. **Only a comprehensive reform package can deliver strong growth over the medium term.** Complementary labor and service sector reforms are essential to boost job creation, investment, and growth. The extent of the macroeconomic gains will depend on the depth and breadth of undertaken reforms. Measures could focus on pursuing further product market liberalization to promote competition. Reductions in the labor tax burden, matched by expenditure cuts, could be particularly effective as cross-country studies suggest. In this connection, a timely fiscal consolidation would allow a reduction of the tax wedge, which is among the largest in EU. Promoting decentralized wage bargaining would allow wages to be more aligned with productivity, providing firms with better incentives to invest. Reforms to address labor market dualism, through harmonizing labor contracts and employment legislation between permanent and temporary employment, can boost employment and social cohesion.

38. **International experience points to some critical success factors in designing structural reforms.** The current recovery provides a unique opportunity to embark on growth enhancing structural reforms. Complementary labor and product market reforms along with expenditure-based fiscal consolidation reinforce each other. Comprehensive reform packages yield better macroeconomic gains than “piece-meal” reforms. An effective communication strategy plays a major role in raising public awareness of the need for reforms and the costs of status quo (non-reform), and in seeking buy-in from key stakeholders. Establishing an independent review and advisory body for reforms could foster consensus and focus policies on priority areas, while ensuring the continuity of the reform agenda. The government’s unity behind the reform plans and the ownership of the initiatives are crucial prerequisites. Involving sub-national governments in reform debates and building wide-based consensus across different levels of governments, especially in light of fiscal federalism, will be crucial for ensuring successful reforms in Italy.

Table 1. An overview of performance in each policy area at aggregate level - 2009

Policy areas -- Aggregate scores for Italy	Indicator-based assessment (LAF) relative to EU-15	
	Level	Change
Labour market		
Active labour market policies**	-4	2
Making work-pay: interplay of tax and benefit system***	-2	-1
Labour taxation to stimulate labour demand ***	-5	1
Job protection and labour market segmentation/dualisation**	-4	-3
Policies increasing working time***	11	-2
Specific labour supply measures for women***	-1	4
Specific labour supply measures for older-workers***	-3	2
Wage bargaining and wage-setting policies**	-3	4
Wage moderation	*-6*	*-4*
Wage differentiation	*1*	*12*
Immigration and integration policies***	-2	-10
Labour market mismatch and labour mobility**	5	13
Competition policy framework*		
Sector specific regulation (telecom, energy)**	1	-4
Sub-aggregate I: telecommunications	-5	0
Sub-aggregate II: energy	*-3*	*-6*
Sub-aggregate III: others	*-7*	*7*
*Business environment - Regulatory barriers to entrepreneurship***		
Business Dynamics - Start-up conditions***	-11	-5
Financial markets and access to finance*	-11	-14
Sub-aggregate I: competition-efficiency	-5	0
Sub-aggregate II: financial market integration	*-8*	*0*
Sub-aggregate III: Competition on financial retail markets	*-4*	
*Market integration - Openness to trade and investment***	*0*	
Integrazione del mercato - apertura del commercio e degli investimenti**	-3	2
Innovation		
R&D and Innovation***	-9	5
ICT**	-3	-9
Education and life long learning***	-8	4
Sub-aggregate I: education	*-8*	*7*
Sub-aggregate II: life-long-learning	*-7*	*-9*
Macroeconomy		
Orientation and sustainability of public finances ***	-2	3

Source: Codogno L., and Felici, 2008

Note: For each policy area the overall quality of coverage by narrow list indicators is signalled: *** stands for broad coverage, **medium coverage and * narrow coverage. This table presents the aggregate continuous score for each policy area, which is a weighted average of the values of the indicators in the narrow list. The scores for individual indicators are computed as follows: score = 10 * (indicator- EU15average)/standard deviation EU15. The results indicate the levels for the latest available year and progress made (change). Consequently, a score of 10 means that the value of the indicators is 1 standard deviation above EU-15 average. The policy area is considered as underperforming if the aggregate score is below -4. The table also shows the number of underperforming indicators (their scores are less than -4) in the narrow list (both in terms of level and growth) as well the total number of indicators in the narrow list.

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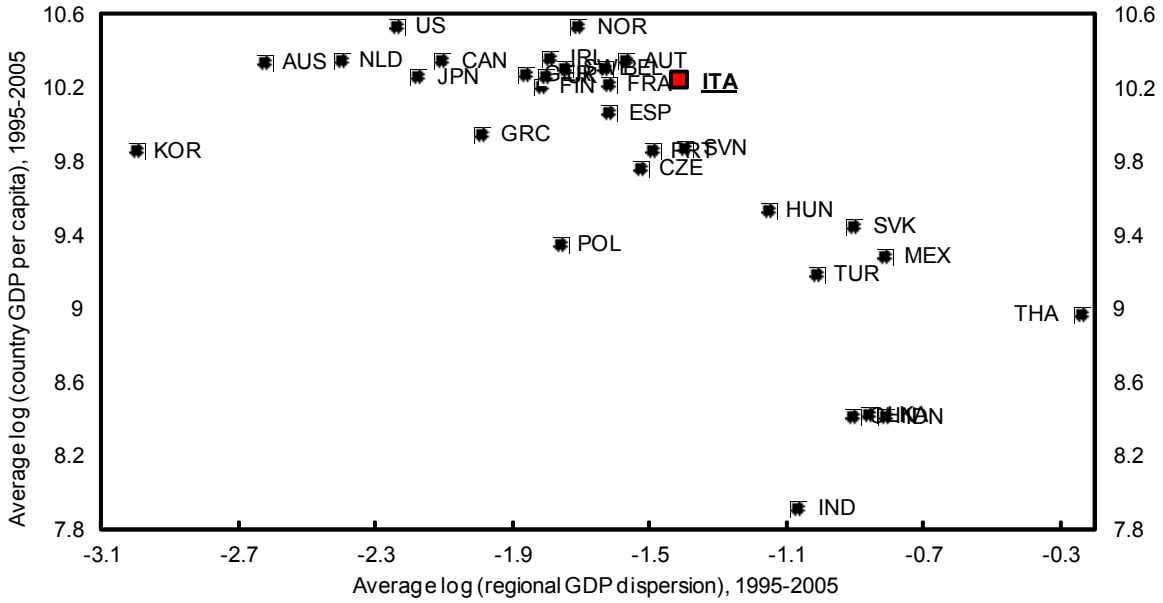
II. ITALY'S REGIONAL DISPARITIES[1]

Italy is characterized by large regional disparities in terms of per capita income as well as labor market performance, in particular between the developed Center-North and the lagging South. Regional inequalities in employment and participation rates are especially pronounced, and unemployment disparities are substantial by international comparison. The crisis has further worsened labor market disparities.

1. **Italy suffers from regional economic disparities**. Northern Italy's GDP per capita, which is higher than the EA average, is almost double that of the South. Economic activity is geographically concentrated in few regions. About 40 percent of the national GDP growth was driven by three regions during 2000–2007.

2. **Regional income disparities explain a substantial variation in national income capita.** Countries with large regional income disparities have lower income per capita Italy's GDP would be 11 percent higher if the income of the poorer regions could be raised to reach the same level of disparity between the poorer and the richer regions as in the US..



Source: Spilimbergo and Xingyuan, IMF Working paper, *Structural Reforms and Regional Convergence* (forthcoming), 2011.

[1] Prepared by Hanan Morsy (EUR).

Actual and Hypothetical and Actual GDP (1995-2005) 1/

Country	Hypothetical GDP per capita	Actual GDP per capita	Percentage change from actual to hypothetical GDP
Japan	29,723	29,385	1.15
Canada	31,812	31,383	1.36
Germany	30,925	29,392	5.08
Finland	29,175	27,726	5.1
Ireland	34,079	32,268	5.46
Belgium	32,247	30,353	6.05
Sweden	30,943	29,083	6.2
Greece	23,135	21,724	6.29
Slovenia	24,721	23,136	6.63
United Kingdom	31,245	29,172	6.86
Norway	41,114	38,203	7.35
Poland	12,642	11,626	8.37
Czech Republic	19,155	17,614	8.38
Austria	31,371	28,694	8.92
Spain	26,323	23,834	9.93
Italy	30,957	27,728	11.02

Source: Spilimbergo and Xingyuan, IMF Working Paper, *Structural Reforms and Regional Convergence,* 2011.

1/ The hypothetical GDP is calculated assuming that the GDP of the poor part of a country (the poorer regions that consist 2/3 of the population) increase so that the ratio of GDP per capita between the rich part of the country (the richer regions that consist 1/3 of the population) and the poor part is equal to the ratio of the US. Both the hypothetical and actual GDP numbers are averages over the period of 1995-2005.

3. **Regional differences in productivity are important but not unusual by international comparison**. Regional differences in productivity, which are not unusual by OECD standard, explain about 40 percent of the variation in regional GDP per capita, with the rest explained by the regional variation in labor markets.

4. **Regional inequalities in employment and participation rates are especially pronounced.** Italy's coefficient of variation for the regional employment rate is the highest in the EU. Similarly, the Gini index for regional labor participation in Italy shows one of the largest regional disparities among OECD countries. In addition, regional differences in female participation rates are very large (more than 30 percentage points). This is partly due to differences across regions in educational attainment and sectoral specialization patterns. Employment is concentrated in public administration, education, construction, and agriculture in the South, and in manufacturing and financial services in the Center-North.

Regional Comparision by Selected Indicators, 2009

Regions	Participation rate (percent)	Unemployment rate (percent)	Real GDP per capita	Population (millions)
North	53.6	5.3	23,831	27.4
South	41	12.6	13,838	14.1
Center	51.3	7.2	22,440	11.8

Sources: Istat; Haver; and IMF staff calculations.

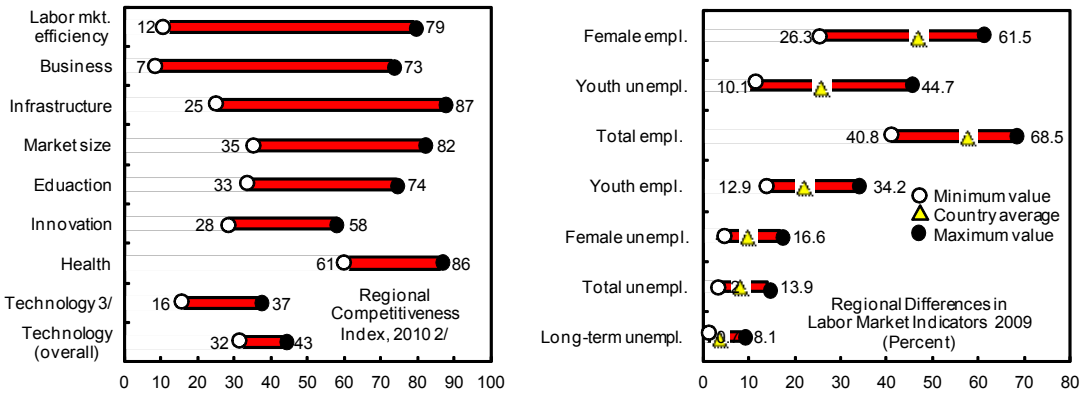
5. **Regional unemployment disparities are substantial by international comparison**. Italy stands out among OECD countries in terms of large regional unemployment variations, especially for youth and long-term unemployment rates. The relative position of individual regions has changed little, especially for those with the highest or lowest unemployment rates. High unemployment regions also suffer from related forms of labor market weaknesses such as low labor force participation and, in many cases, long-term unemployment. Persistent regional unemployment suggests there is insufficient incentive for either labor to move out or

private capital to move in. This is confirmed by the low level of internal migration in Italy after the 1960s and its inadequacy to act as a rapid adjustment mechanism.

6. **Educational performance shows wide regional variations**. As both a cause and a consequence of long-standing regional imbalances in the labor market, schools and universities do not seem to produce the same results in the North and in the South of the country. The range of regional variation in the proportion of adults with only basic education attainment is higher than 20 percentage points.

7. **Regional competitiveness gaps are strikingly wide**. Substantial regional disparities exist in terms of labor market efficiency, business environment, infrastructure, education, and innovation. The South faces problems of inadequate infrastructure, corruption and organized crime, all preventing investment in that area. Italy shows one of the greatest regional variations in murder rate average among OECD countries.

Italy: Regional Differences in Competitiveness and Labor Market 1/



Sources: ISTAT; European Commission, *EU Regional Competitiveness Index 2010*; and IMF staff calculations.
1/The analysis is based on 20 Italian regions: Piemonte, Valle D'Aosta, Lombardia, Liguria, Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Emilia Romagna, Toscana, Umbria, Marche, Lazio, Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicilia, and Sardegna. The same legend pertains to both charts.
2/ Scores are in 0-100 range, with "0" denoting the lowest competitiveness across international regions covered in the index. Sub-scores are presented as min-max normalized scores (as percentage) and are divided into six classes, with high values associated with high competitiveness.
3/ Refers to households.

8. **The crisis has further worsened labor market disparities**. In the North and Center, improvements in employment rates contributed the most to per capita GDP growth before the crisis, while the productivity deteriorations explained most of the output contraction during the crisis.

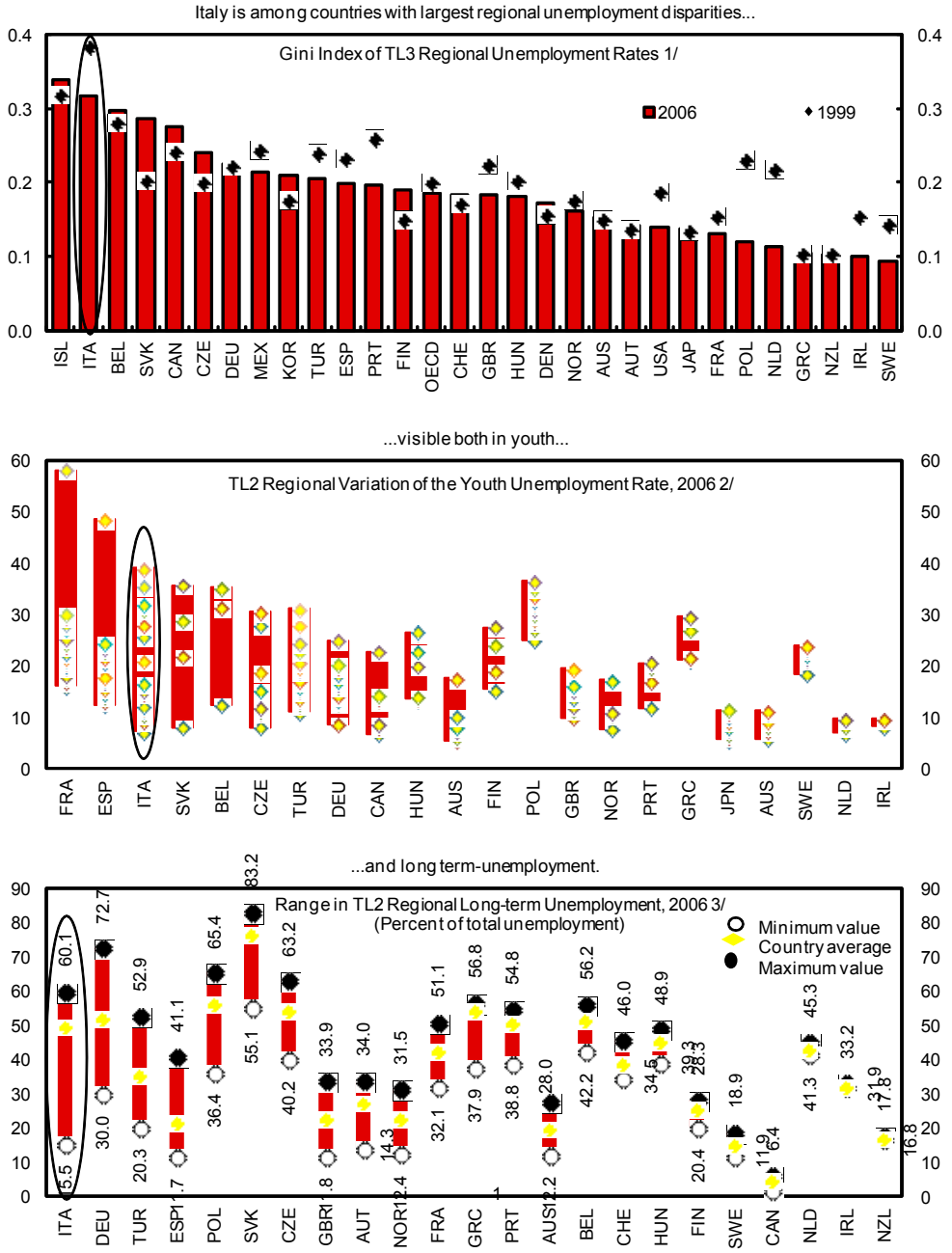
Contributions to Regional Real GDP Per Capita Growth 1/
(Percent, unless stated otherwise)

Average	2004-2007				2007-2009			
	Producivity	Employment rate	Share of working age in total	Real GDP per capita growth	Producivity	Employment rate	Share of working age in total	Real GDP per capita growth
North	0.6	2.6	-1.4	1.8	-6.9	-1.6	-0.6	-9.1
Center	-1.1	2.3	-0.9	0.2	-5.5	-0.6	-0.2	-6.3
South	1.2	1.5	-0.1	2.6	-2.6	-3.8	0.3	-6.0

Sources: ISTAT; and IMF staff calculations.
1/ Analysis based on three geographical areas: North, Center, and South (includes Islands).

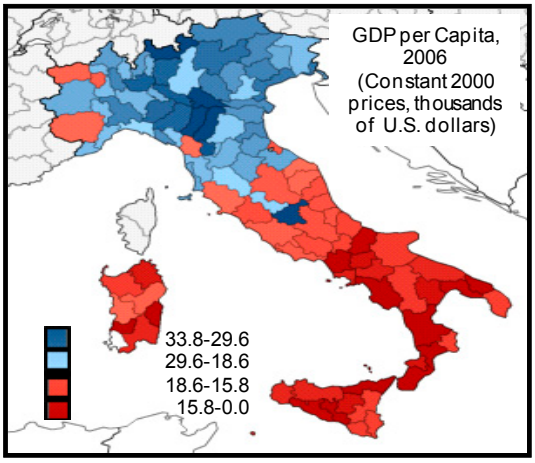
The South experienced the lowest employment gains in 2004–2007, but it suffered the highest employment losses during the crisis. Labor hoarding seems to be more of a phenomenon of the North-Center.

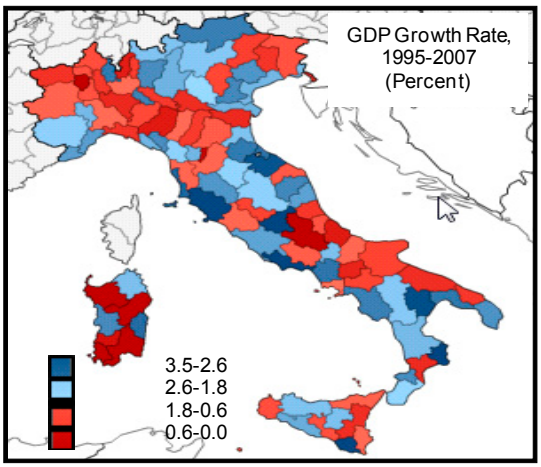
Cross-country Regional Comparisons

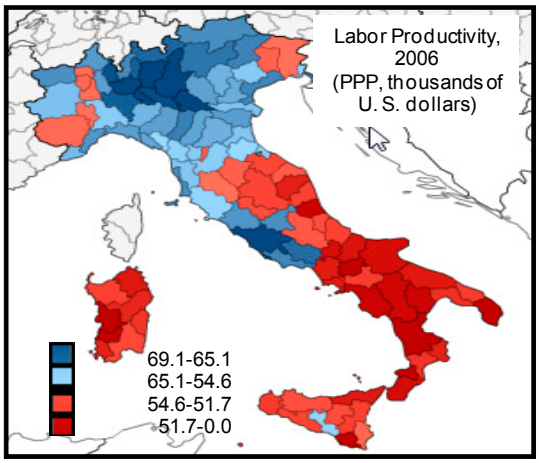


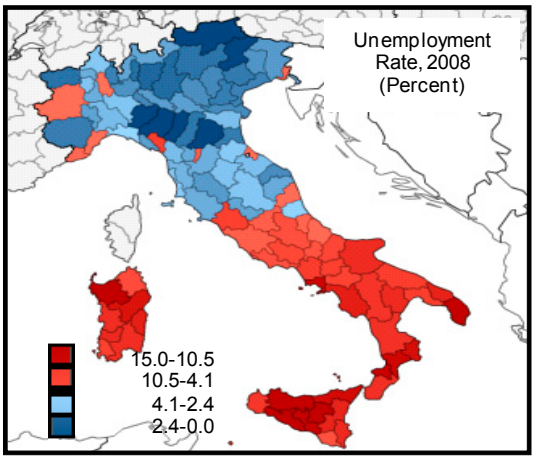
Source: OECD.
1/ Available years for Iceland 1999–2002; Turkey 2004-2006. Australia and Canada data are based on regions different than TL3, labelled Non Official Grid (NOG). Mexico and Turkey values only for TL2 regions.
2/ Data available only at TL2. No regional data available for Denmark, Iceland, Korea, Mexico, New Zealand, Switzerland and United States.
3/ No regional data available for Denmark, Iceland, Japan, Korea, Mexico and the United States.

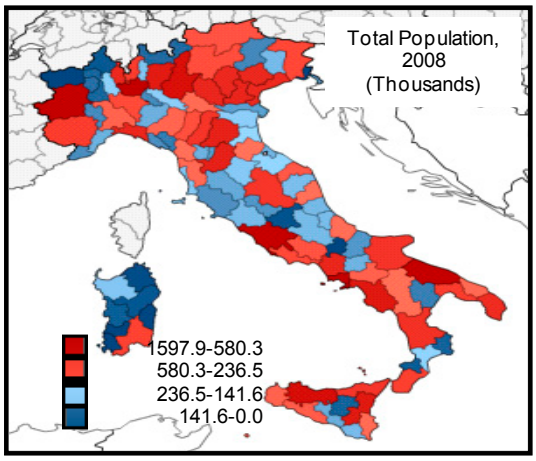
Italy: Regional Heatmaps

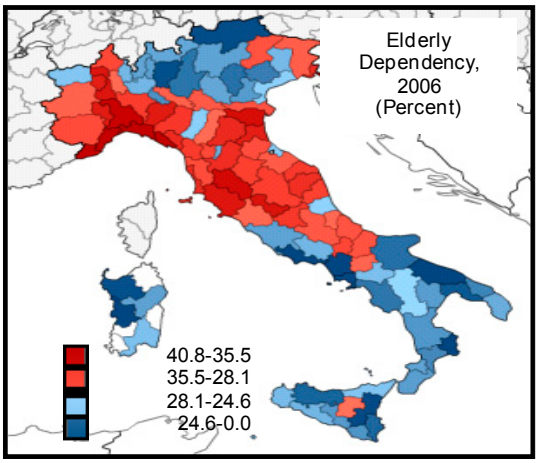






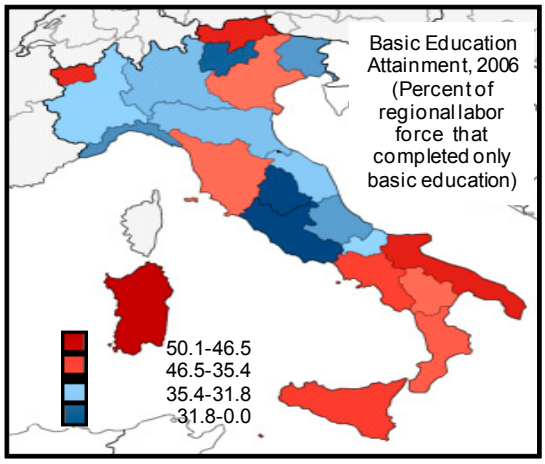


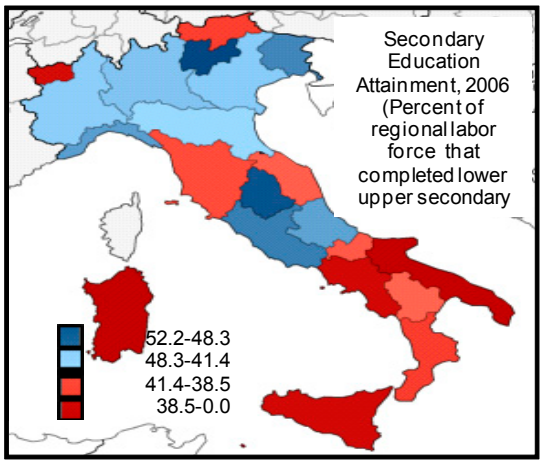


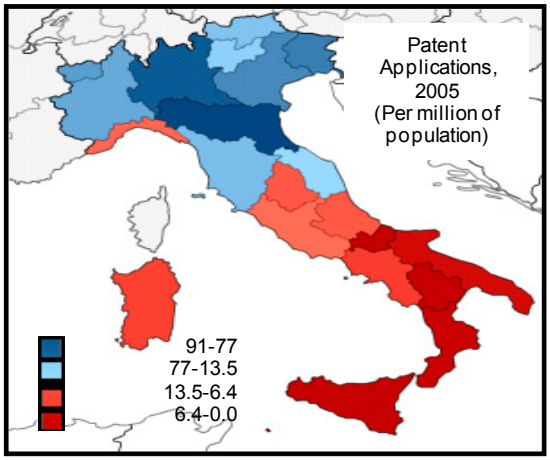


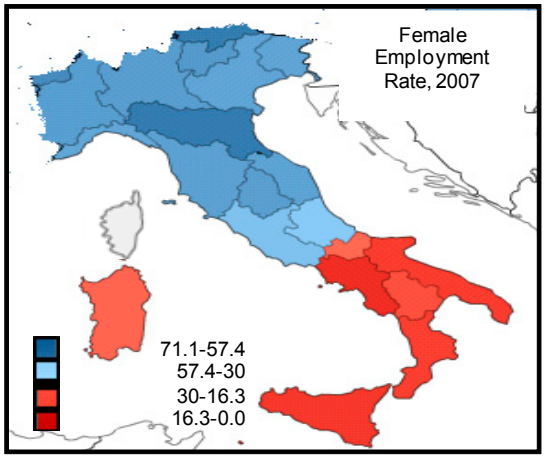
Source: OECD, TL3 regional breakdown.

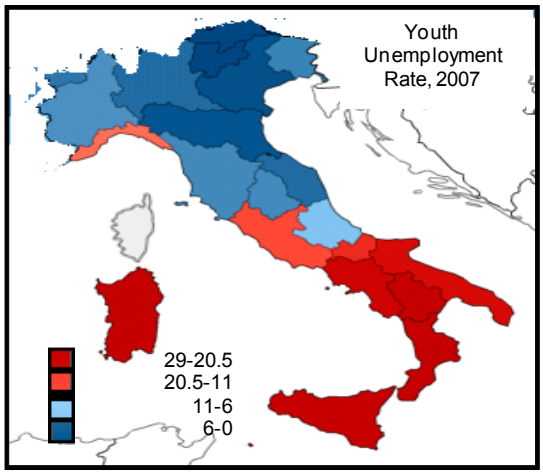
Italy: Regional Heatmaps, (continued).

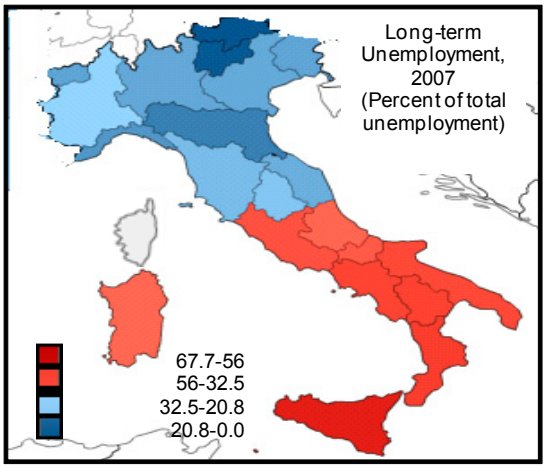






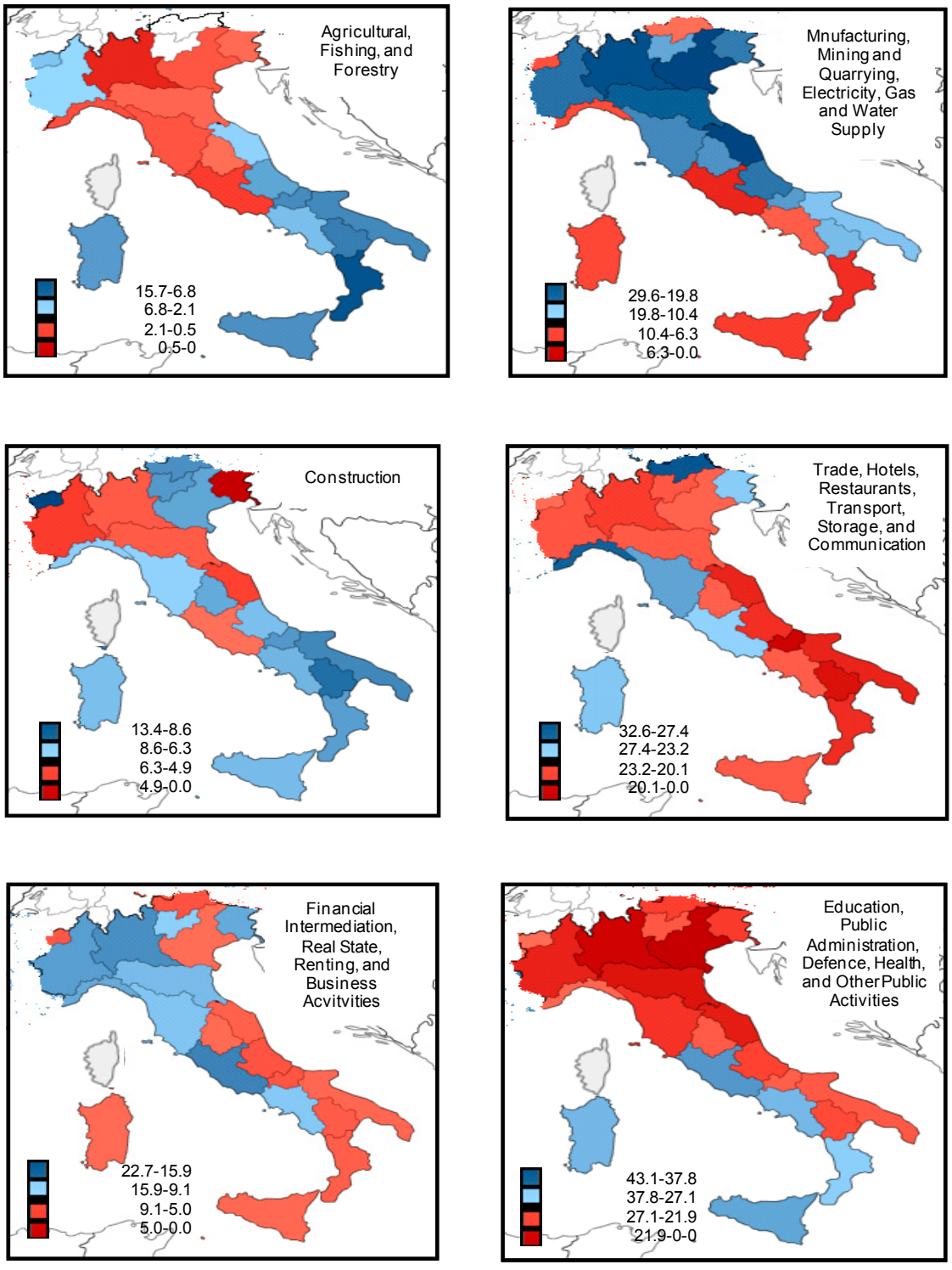






Source: OECD, TL2 regional breakdown.

Italy: Regional Employment by Sector, 2006.
(Percent)



Source: OECD, TL2 regional breakdown.

III. Decentralizing Spending More Than Revenue: Is It Bad For Fiscal Performance?[1]

Vertical fiscal imbalances (VFIs) materialize when spending decentralization outpaces revenue decentralization. Based on a cross-country approach, this paper finds a significant and robust negative relationship between VFIs and fiscal performance in OECD countries, especially in the presence of sizeable regional disparities. Italy could benefit from narrowing its VFI but the currently envisaged VFI reduction appears modest and has yet to be turned into an effective increase in sub-national tax autonomy.

A. Introduction

1. **Many OECD countries have undertaken fiscal decentralization reforms in recent decades**, assigning more expenditure functions and revenue sources to lower levels of governments. The decentralized provision of goods and services is generally intended to better take into account differing local preferences, increase efficiency of public services, and enhance the accountability of sub-national authorities (Oates, 1972).

2. **However, the devolution of spending responsibilities has not always gone hand in hand with the devolution of tax revenues, resulting in "vertical fiscal imbalances".** Sub-national authorities have to rely on transfers and, to a lesser extent, on borrowing in order to finance expenditure. This paper uses the concept of "vertical fiscal imbalance" (VFI) to measure the gap between own revenue and spending of sub-national governments.

3. **Large vertical imbalances may relax fiscal discipline.** Although some level of discrepancy between sub-national own revenues and spending is inevitable and may even be desirable, large gaps present risks. A common view in the normative literature is that a high reliance on intergovernmental transfers or borrowing "softens" the budget constraint of local governments, in particular because the cost of spending is not adequately internalized (Rodden and others, 2003). However, the empirical literature shows conflicting results. Some papers find that intergovernmental transfers improve fiscal performance by strengthening control over sub-national spending (De Mello, 2000).

4. **Ensuring a better match of sub-national spending responsibilities with taxing powers is at the core of Italy's evolving fiscal federalism reform.** While the reduction in Italy's VFI has been among the largest in the OECD countries since 1995, still, about half of sub-national expenditure is financed through transfers. The resulting vertical imbalance

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[1] Prepared by Luc Eyraud (FAD) and Lusine Lusinyan (EUR). The authors are grateful to Izabela Karpowicz, the participants of the seminar held at the Bank of Italy, the Ministry of Economy and Finance staff, and the members of the Technical Commission for Implementation of Fiscal Federalism (COPAFF) for helpful discussions and comments.

remains above the OECD average. The mismatch between local spending and revenues is seen by the Italian authorities as a major cause of the country's fiscal problems. To this end, reforms are being implemented to phase out most non-equalization intergovernmental transfers and, accordingly, increase sub-national own revenue and shared taxes by 2017. Furthermore, cuts in sub-national transfers are also a key element of the medium-term fiscal consolidation plan adopted by the government in 2010.

5. **This paper assesses whether lowering vertical imbalances improves fiscal performance in OECD countries.** It presents several elements of novelty. First, it adopts a cross-country approach, in contrast to the prolific case study literature on VFIs. Second, it identifies conditions under which VFIs impact fiscal performance. Third, it analyzes the combined effect of vertical and horizontal imbalances. And lastly, the paper uses an instrumental variable estimation to address the potential endogeneity bias of the VFI in a fiscal performance equation.

6. **Our empirical results support the widespread normative view that spending decentralization is not detrimental to fiscal performance when financed through sub-national own revenues and that decreasing vertical imbalances can potentially generate large fiscal gains.** A higher reliance on transfers or borrowing reduces the general government balance, other factors being equal. We also find that the negative impact of VFIs is more pronounced when regional disparities are large.

7. **The paper is organized as follows.** Section B reviews the economic literature on VFI and fiscal performance. Sections C defines and discusses the indicator of VFI applied in Section D to produce stylized facts. Section E uses econometric methods to relate the VFI to fiscal outcomes. Section F discusses aspects of Italy's fiscal decentralization process and draws implications for Italy from the econometric analysis. Section G concludes.

B. Vertical Fiscal Imbalance and Fiscal Performance

8. **A vertical imbalance exists when there is a gap between own spending (total spending minus transfers paid) and own revenues (total revenues minus transfers received) at a given level of government.**[2] There is no consensus on the specific definition of the vertical imbalance. Most studies use interchangeably the terms "vertical fiscal imbalance", "vertical fiscal gap" (VFG) or "transfer dependency". Researchers generally apply the VFI concept to sub-national governments; but gaps can also materialize at the central level.[3] Furthermore, VFI and decentralization are closely related: when new spending

[2] In the paper, the term "transfer" always refers to intergovernmental (not interpersonal) transfers. "Own revenues" include both tax and non tax revenues, measured as the difference between total revenues and intergovernmental transfers received by a given level of government.

[3] Both gaps are often related as the sub-national "vertical deficit" is generally covered by intergovernmental transfers and is likely to be associated with a central government "vertical surplus".

responsibilities assigned to sub-national governments are not matched with additional revenue autonomy, their financing needs have to be met by higher transfers from the center (and/or higher borrowing).

9. **The normative literature generally emphasizes the risks associated with large vertical imbalances.** A common view is that the vertical structure of the public sector may "soften" the budget constraints of sub-national governments, lead them to overspend, and lower their tax effort—mainly because they do not fully internalize the cost of spending and/or anticipate that their financing gap will be covered by additional transfers. The lack of discipline of local governments may spill over to the center if the latter is pressed to bail out sub-national authorities. VFIs may thus lead to excessive and unproductive spending, inefficient revenue mobilization, higher borrowing costs, and lower accountability of local authorities. Conversely allowing sub-national governments to access own revenue through local taxation is seen as essential to promoting fiscal discipline (Oates, 2006; IMF, 2009; Blöchliger and Petzold, 2009).

10. **However, closing the vertical gap is not always feasible or even beneficial.** As the optimal degree of decentralization is generally larger on the spending than on the revenue side, sub-national authorities have often no choice but to rely on transfers and borrowing to bridge the financing gap. In addition, transfers may be warranted on efficiency and equity grounds with a view to: better controlling sub-national spending, providing insurance to local authorities against external shocks, internalizing inter-jurisdictional spillovers, or pursing redistributive/equalization objectives (Box 1).

Box 1. Cost-Benefit Analysis of Vertical Imbalances in the Theoretical Literature

Reliance on transfers or borrowing may undermine the fiscal discipline of local governments for the following reasons:

- *Common pool effect*. When financed through transfers, sub-national governments do not internalize the full cost of local expenditure and tend to overspend/lower their tax effort.
- *Soft budget constraint*. Sub-national governments carry out looser policies when they anticipate transfer-based bailouts by higher-level authorities.
- *Soft financing*. Access to borrowing should not contribute to chronic deficits if the market imposes discipline. But in practice, sub-national governments often resort to "soft" financing (by borrowing from public banks or from state-owned enterprises, for instance), which results in another form of soft budget constraint/quasi-bailout (Oates, 2006).
- *Governance and accountability*. Discretionary grants are prone to undue sub-national influence or interest. In addition, local authorities are less accountable when they do not have to tax their constituency.

- *Vertical spillovers*. Local borrowing and transfer dependency may affect the central government performance by: crowding out available financing and putting upward pressure on interest rates; pushing up risk premia on government bonds; or through the cost of bailouts (IMF, 2009).
- *Grant design*. For instance, many grants have a matching dimension, with grant allocation increasing when sub-national governments spend more on the matched service.

However, some degree of vertical imbalance is inevitable. The degree of spending decentralization called for by efficiency considerations tends to exceed the degree of tax autonomy that would be consistent with optimal tax assignment (Ter-Minassian, 1997a):

- *Tax centralization*. Only a few tax bases are best suited for local management—those that are immobile, evenly distributed geographically and that generate stable revenues, whereas nationwide taxes have fewer distortionary effects on flows of mobile resources, and permit a higher degree of progressivity (Joumard and Kongsrud 2003; Ter-Minassian, 1997b; Norregaard, 1997; and McLure and Martinez-Vasquez, 2000).
- *Spending decentralization*. The scope to increase sub-national spending on efficiency grounds is larger. According to Oates' Decentralization theorem (1972), decentralized provision is at least as efficient as central government provision, efficiency requiring that diversity of preferences be matched with diversity in public good and service provision. In addition, sub-national governments face competitive pressures to attract mobile residents, resulting in more efficient provision of public goods.
- *Capacity constraints.* Tax devolution is limited by the lower tax administration capacity of local governments and diseconomies of scale in tax administration (Ter-Minassian, 1997b). More generally, the quality of bureaucracies is usually lower at the sub-national level.

Vertical imbalances may even be desirable in some cases.

- *Control over local spending*. Curtailing transfers may be used by central governments to constrain sub-national spending and, as such, could improve fiscal performance. More generally, stabilization and adjustment policies conducted by the center may be undermined if a large share of taxes and spending is devolved to sub-national governments.
- *Insurance against external shocks*. When sub-central governments come under fiscal pressure that has purely external origins, the center should provide assistance through transfers.
- *Redistribution*. Equalization grants are needed to transfer resources to poorer regions and correct horizontal imbalances (revenue-raising capacity disparities). In addition, sub-national governments are often given responsibility for implementing national programs meant to be provided equally across regions (although intergovernmental grants are not the most efficient instrument to achieve interpersonal redistribution objectives).
- *Internalize horizontal (inter-jurisdictional) externalities*. Matching grants may provide incentives for lower level governments to invest in public goods that have positive spillover effects into other jurisdictions.
- *Internalize vertical (intergovernmental) externalities*. Grants may be used to limit the negative implications of under-spending at the local level (on primary and secondary education, for instance) on central government spending (on tertiary education).

11. **The empirical literature on vertical imbalances is abundant but mostly draws on case studies.** Most papers are country-specific, while cross-country work is scarce and relatively recent, focusing on OECD countries. The literature is particularly rich for Australia, Canada, Germany, and Italy. However, case studies rarely relate VFIs to fiscal performance.

12. **Cross-country papers find that large vertical imbalances are generally associated with worse fiscal performance.**[4] A vast econometric literature on the "flypaper-effect" tests the impact of intergovernmental transfers on local spending (Gamkhar and Shah, 2007). In contrast, fewer papers relate vertical imbalances to fiscal performance. Rodden (2002) provides evidence that higher reliance on intergovernmental transfers worsens the general government overall balance, especially when sub-national governments have high borrowing autonomy. Similarly, Plekhanov and Singh (2007), find that the rules constraining sub-national borrowing improve fiscal performance when transfer dependency is high. In a sample of federations, Rodden and Wibbels (2009), show that transfer dependency is associated with larger fiscal deficits, the negative impact being larger at high levels of decentralization. Jin and Zou (2001) find that transfers increase the size of the government, at the sub-national, national, and general government levels. Fornasari (2000) also demonstrates that sub-national spending funded by transfers is additional to central government spending, not a substitute. Finally, transfer growth may become endogenous, with deficits bringing about more grants, which in turn generate higher deficits, according to De Mello (2007).

13. **However, the empirical literature is not consensual.** According to De Mello (2000), transfer dependency only deteriorates the fiscal position of the central government in non-OECD countries, while the opposite result is found in OECD countries. His interpretation is that, in the OECD sample, transfer dependency measures the ability of central governments to control sub-national finances rather than indicates common pool problems. This result is consistent with the findings of the comparative literature on successful fiscal consolidations. Based on a sample of OECD countries, Darby and others (2005), show that central governments exert a strong influence on the expenditure of sub-central tiers through their grant allocations; changes in transfers "force the hand" of sub-national governments to adjust expenditure and have a positive impact on the duration of consolidation attempts.

C. Measuring Vertical Fiscal Imbalances

14. **Different measures of vertical imbalances are used in the empirical literature.** Transfer dependency is the most common indicator with transfers measured either as a share of sub-national spending (Jin and Zou, 2002), or as a share of sub-national total revenues (Rodden, 2002; Baskaran, 2010), or even as a share of central government revenues (Bahl

[4] Most of the empirical literature uses "transfer dependency" as a measure of the vertical imbalance, the former being defined as the ratio of transfers received by sub-national governments to their total revenues (or spending).

and Wallace, 2007). Some papers measure VFI as the difference between own revenues and own spending rather than the ratio, bringing the concept closer to a fiscal balance (Bird and Tarasov, 2004). Others distinguish between "vertical gap" and "vertical imbalance".[5]

15. **We define the vertical imbalance as the share of sub-national own spending not financed through own revenues**, as Ahmad and Craig (1997), or Shroeder and Smoke (2002). By definition, the counterparts of the VFI are sub-national borrowing and transfers received from other units of general government—both expressed as shares of sub-national own spending (Box 2). In contrast to most of the literature focusing on transfer dependency, our measure of VFI also includes borrowing. There is a strong case for combining transfer and borrowing—two forms of "soft" financing—whereas "own revenues" are more likely to "harden" the budget constraint. Sub-national governments have generally less autonomy over transfers and borrowing, and fewer incentives to use them efficiently (Box 1).[6]

16. **Our vertical imbalance measure presents a number of advantages.** First, it extends the concept of "transfer dependency" to sub-national borrowing, which is another "soft" resource (see above). In addition, borrowing is an important contributor to VFI dynamics, as shown in Section D (Fact 2). Second, our indicator measures the mismatch between spending and revenue decentralizations; it widens when countries devolve more spending than revenue. Third, the VFI also varies with changes in the general government overall balance (Box 2). Intuitively, the general government balance term describes the size of the revenue and spending "pies" to be shared among levels of government, whereas the decentralization terms determine the sharing formulae.

17. **Owing to data constraints, our VFI measure cannot be easily refined.** Its main shortcoming—common to other empirical studies—is that it is an imperfect indicator of the fiscal autonomy of sub-national governments. Several studies (Blöchliger and others, 2006; and Rodden, 2002), show that "own revenues" do not measure accurately the discretion of sub-national governments over their resources in part because tax sharing arrangements are sometimes recorded under taxes. Also, sub-national governments may be given only restricted discretion concerning tax rates/bases. A similar issue arises on the spending side, with much sub-national spending being regulated, mandated or earmarked (Bach, 2009). On the revenue side, this issue cannot be easily addressed as databases do not report separately

[5] According to Boadway (2002), and Lazar and others (2004), the existence of a vertical gap does not necessarily imply that there is an imbalance. A VFI appears when the actual VFG differs from the optimal gap between levels of government. In their view, the VFI concept is a normative concept founded in theory in contrast to the VFG. Our paper does not make this distinction.

[6] According to Oates (2006), "Soft budget constraints manifest themselves both in terms of transfer dependency and a poorly functioning banking system that is subject to manipulation by public officials for funding deficits." Rodden and others (2003), also claim that "If soft budget constraints exist and the sub-national governments can appeal to the central government for additional resources through channels such as intergovernmental fiscal transfers, state-owned enterprises, and banking, they are likely to overspend, undertax, or overborrow".

tax sharing arrangements. This said the magnitude of the problem should not be overplayed: shared taxes are only sizeable in some countries (usually federal ones) and account on average for less than 20 percent of sub-national revenues (Blöchliger and King, 2006). Another problem is that our VFI indicator is based on actual spending and revenues, which may differ from assigned responsibilities owing to cyclical factors, administrative and capacity constraints, or simply the willingness of sub-national governments to use the powers assigned to them.

Box 2: Vertical Fiscal Imbalance: Definition and Accounting Determinants

We define the VFI as:

$$VFI = 1 - \frac{SNG\ own\ revenue}{SNG\ own\ spending}$$

The vertical imbalance is covered by sub-national borrowing and transfers from the center.

As $SNG\ spending = SNG\ own\ revenue + transfer\ received\ by\ SNG + SNG\ net\ borrowing$ and

$SNG\ spending = SNG\ own\ spending + transfer\ paid\ by\ SNG$, then:

$$\boxed{VFI = Transfer\ dependency + SNG\ deficit}$$

where:

$$Transfer\ dependency = \frac{Net\ transfer}{SNG\ own\ spending}$$

$$SNG\ deficit\ = \frac{SNG\ net\ borrowing}{SNG\ own\ spending}$$

The vertical imbalance depends on the mismatch between revenue and spending decentralization (and the size of the general government deficit).

$$\boxed{VFI = 1 - \frac{revenue\ decentralization}{spending\ decentralization} * (1 - GG\ deficit)}$$

where:

$$Revenue\ decentralization = \frac{SNG\ own\ revenue}{GG\ revenue}$$

$$Spending\ decentralization = \frac{SNG\ own\ spending}{GG\ spending}$$

$$GG\ deficit = \frac{GG\ spending - GG\ revenue}{GG\ spending}$$

18. **This paper focuses on vertical rather than horizontal imbalances.** In contrast to "horizontal fiscal imbalances" (HFIs),[7] VFIs measure differences in spending and revenue between levels of government, not across sub-national entities. However, VFI and HFI cannot always be clearly separated (Bird and Tarasov, 2004). For instance, vertical balance can be achieved for the richest sub-national government (balancing own expenditure and own revenues) but not for the other sub-national governments when they are regional disparities (HFIs). Another problem relates to vertical equalization: vertical transfers include equalization grants whose purpose is to reduce income disparities across sub-national jurisdictions; this implies that, in general, measures of VFI also capture HFI.

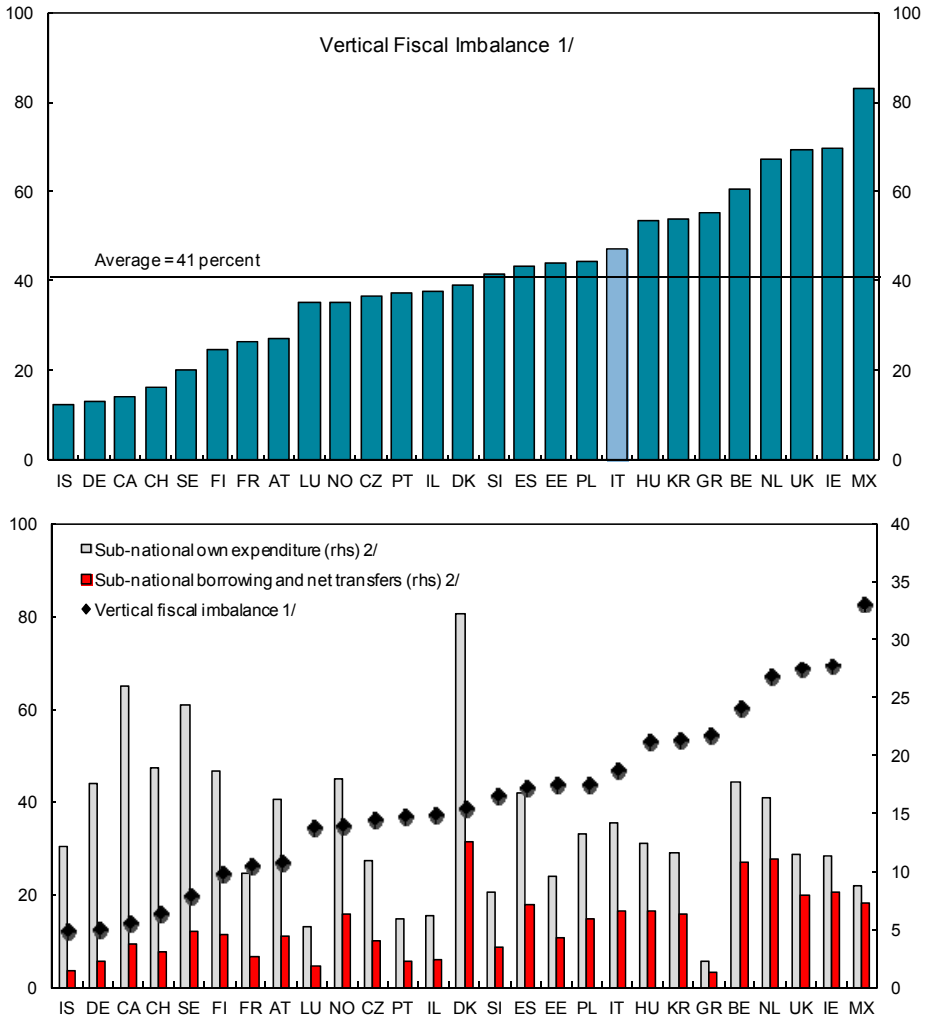
D. Some Stylized Facts on Vertical Imbalances

19. **This section presents stylized facts on vertical fiscal imbalances, their evolution overtime, the dispersion across country, and their relation to fiscal performance.** We use data from the OECD General Government Accounts database (OECD, 2010) covering the years 1995–2007. We exclude 2008 and 2009, as the financial crisis likely disrupted the intergovernmental relations, creating breaks in the series.

- **Fact 1**. **The financing of sub-national spending varies greatly across countries, resulting in sizeable differences in vertical imbalances.** The VFIs average about 40 percent over the sample between 1995 and 2007. However, VFIs present a large dispersion, varying from 13 percent in Iceland to 83 percent in Mexico. Italy's vertical imbalance—at 47 percent—is above average, but still moderate compared to the most imbalanced countries (Figure 1, upper chart). From an accounting point of view, this heterogeneity is mostly related to the dispersion of sub-national expenditures across countries rather than to that of transfers and borrowing (Figure 1, lower chart)—the standard deviation being twice higher in the former case. Charbit and Goodspeed (2009), show that differences in the tax-transfer balance reflect country-specific structural factors, including the role of sub-national governments as providers of national public goods and services (health), regional imbalances, differences in externalities, historical circumstances, collective preferences, and institutional features (in particular the constitution).

[7] HFIs materialize when they are differences between the revenue capacities of individual sub-national governments.

Figure 1. Vertical Fiscal Imbalance, Sub-national Own Revenue and Expenditure
(Percent of sub-national own expenditure, unless otherwise indicated; average over 1995–2007)

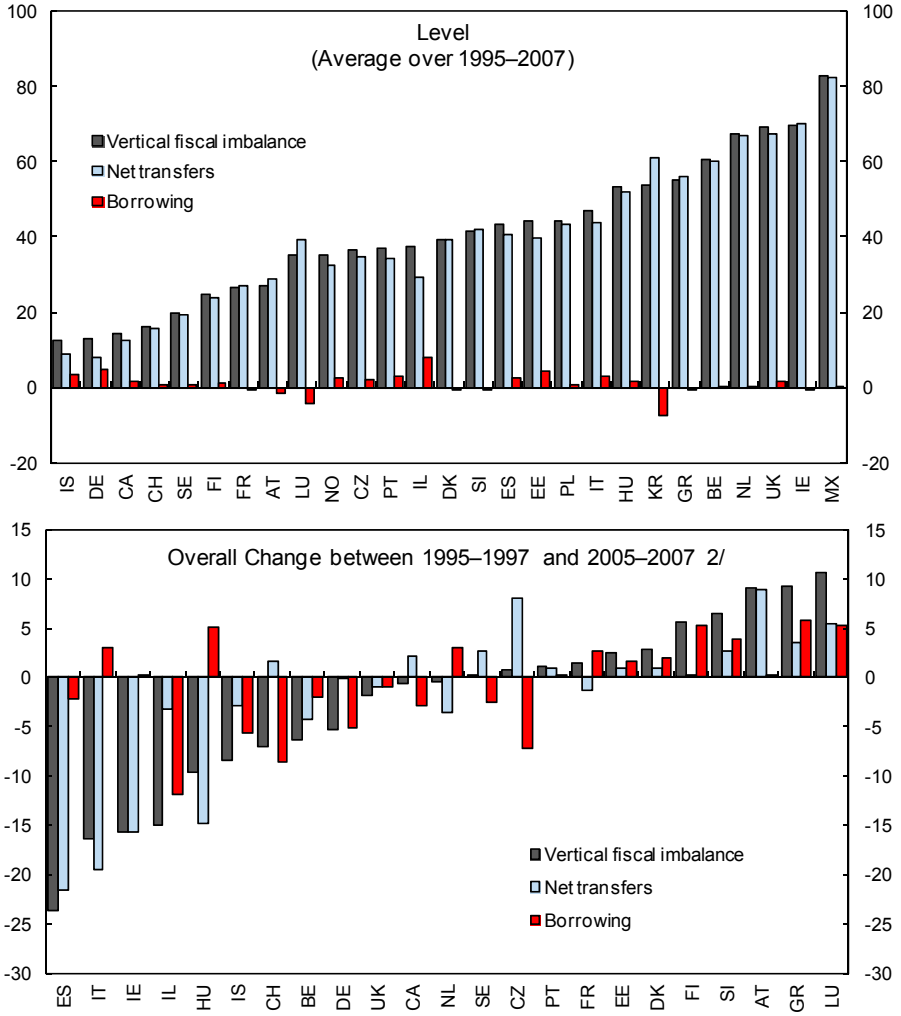


Sources: OECD; and IMF staff estimates.
1/ Vertical fiscal imbalance is defined as the share of sub-national own spending (excluding transfers paid) not financed through own revenue (excluding transfers received).
2/ Percent of GDP.

- **Fact 2. Although vertical imbalances are mostly covered by transfers, sub-national borrowing is essential to understanding the change in vertical imbalances overtime.** On average, sub-national spending is almost entirely financed by transfers (Figure 2, upper chart). In the sample, the share of sub-national borrowing has been close to zero over the period, local authorities being usually constrained to borrow either by administrative procedures, explicit rules, financial market discipline, or cooperative arrangements (Plekhanov and Singh, 2007). However, the effect of borrowing should not be overlooked, as its contribution to the change in VFIs over the period is not negligible: between 1995 and 2007, the change

in borrowing was of comparable magnitude to the change in transfers[8] (Figure 2, lower chart). In other words, sub-national borrowing is low on average but very volatile, which explains its relatively high contribution.[9] This result suggests that measuring vertical gaps with "transfer dependency"—as it is done in many empirical papers—can be misleading for some countries.

Figure 2. Vertical Fiscal Imbalance: Level and Change 1/
(Percent of sub-national own expenditure)



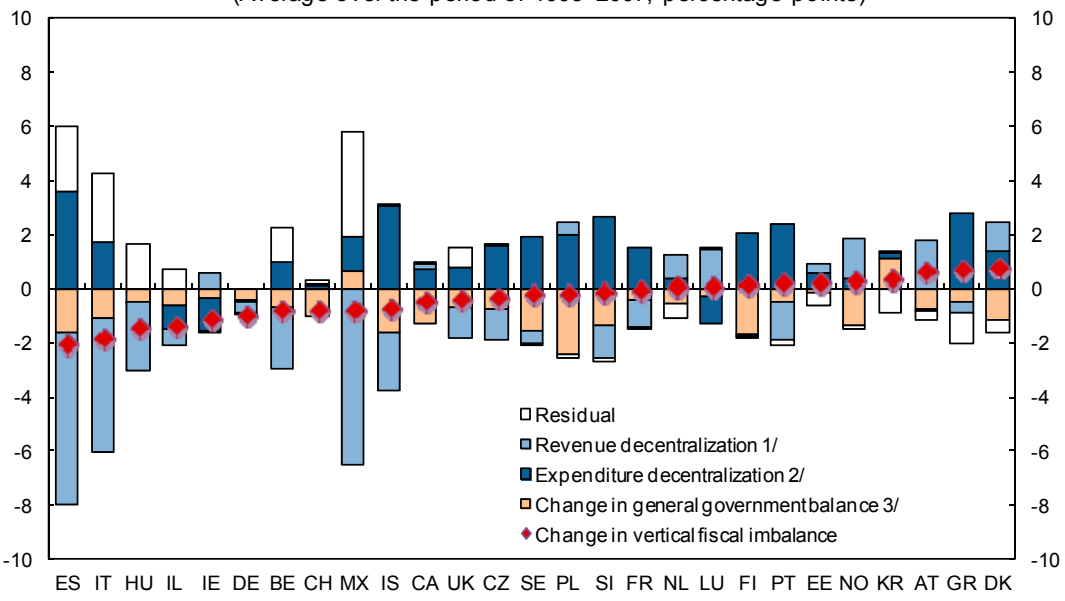
Sources: OECD; and IMF staff estimates.
1/ Vertical fiscal imbalance is defined as the share of sub-national own spending (excluding transfers paid) not financed through own revenue (excluding transfers received).
2/ Percentage points of sub-national own expenditure.

[8] In Figure 2, the change in VFI, transfer and borrowing is computed between 1995–1997 and 2005–2007, (instead of 1995 and 2007), to ensure that our results are not too sensitive to the choice of the initial and final dates.

[9] Among financing sources of sub-national governments, borrowing has the highest volatility relative to transfers (medium volatility) and taxes (lowest volatility).

- **Fact 3. Vertical fiscal imbalances have decreased overtime.** Between 1995 and 2007, the VFIs decreased in most countries, with an average change of about -2.5 percent of sub-national own spending. This feature is particularly striking in Italy, where a strong devolution of revenue responsibilities contributed to lower the reliance of sub-national governments on transfers. This result contrasts with the common view that vertical gaps are supposedly increasing in most countries driven by the mismatch of spending and revenue decentralizations. In fact, these two findings are not contradictory. Figure 3 shows average contributions to the annual changes in the VFIs (Box 3). The fact that spending decentralization outpaced revenue decentralization did widen the VFIs on average; however, this was more than offset by the improvement in the general government balance over the period. In other words, sub-national governments received a larger share of general government spending responsibilities without getting an equivalent share of taxes over the period; nonetheless the VFIs narrowed because general government spending increased less than total revenues on average.[10]

Figure 3. Breakdown of the Annual Change in Vertical Fiscal Imbalances
(Average over the period of 1995–2007; percentage points)



Sources: OECD; and IMF staff estimates.
1/ Negative values = Increase in revenue decentralization; 2/ Positive values = Increase in expenditure decentralization; 3/ Negative values = Improvement in general government overall balance.

[10] This suggests that the gap between revenue and spending decentralization, as often used in the literature, is not a good indicator of the VFI.

Box 3. Contributions to the Change in the Vertical Fiscal Imbalance

According to Box 2:

$$1 - VFI = \frac{revenue\ decentralization}{spending\ decentralization} * (1 - GG\ deficit)$$

Taking the logarithm of this expression and then the first difference, and using the approximation $\ln(1-x) \cong -x$, we compute the contributions of the three variables to the change in the VFI:

$$\boxed{dVFI \approx \mathrm{dln}(spend.decentralization) - \mathrm{dln}(rev.decentralization) + d(GG\ deficit)}$$

Changes in the VFI reflect the impact of two factors: the mismatch between spending and revenue decentralizations, and the changes in general government deficits. This accounting decomposition has also an economic interpretation, as the two terms are relatively independent: the growth differential between spending and revenue decentralizations is a structural institutional feature, which can be considered as given when decisions related to the annual overall deficit are made. Intuitively, countries first agree on how to share the spending and revenue pies between levels of government before determining the size of these pies.

- **Fact 4. There is no evidence that revenue decentralization succeeds expenditure decentralization in the short run.** The conventional wisdom of "finance-follows-function" suggests that devolution on the spending side would lead that on the revenue side. However, country experience often points to a reverse sequencing because: revenue devolution is easier to implement (more attractive for local governments; less resistance at the center to transfer expenditure functions after the funds have been devolved; easier to design tax-transfer system reforms) while assigning expenditure responsibilities is more politically driven with less well-established assignment rules (Bahl and Martinez-Vazquez, 2006). In our sample, bivariate Granger causality tests (for levels of the degree of decentralization, in logarithm) suggest diverse patterns of relationship between spending and revenue decentralization (Table 1). There seems to be limited support to the "finance-follows-function" rule (lower-left section of Table 1). In most countries, we either find the opposite causality, bi-causality, or no causality. However, Granger tests can only detect short-term sequencing, as lag length is restricted to three years by the data.

Table 1: Granger Non-Causality Test Results

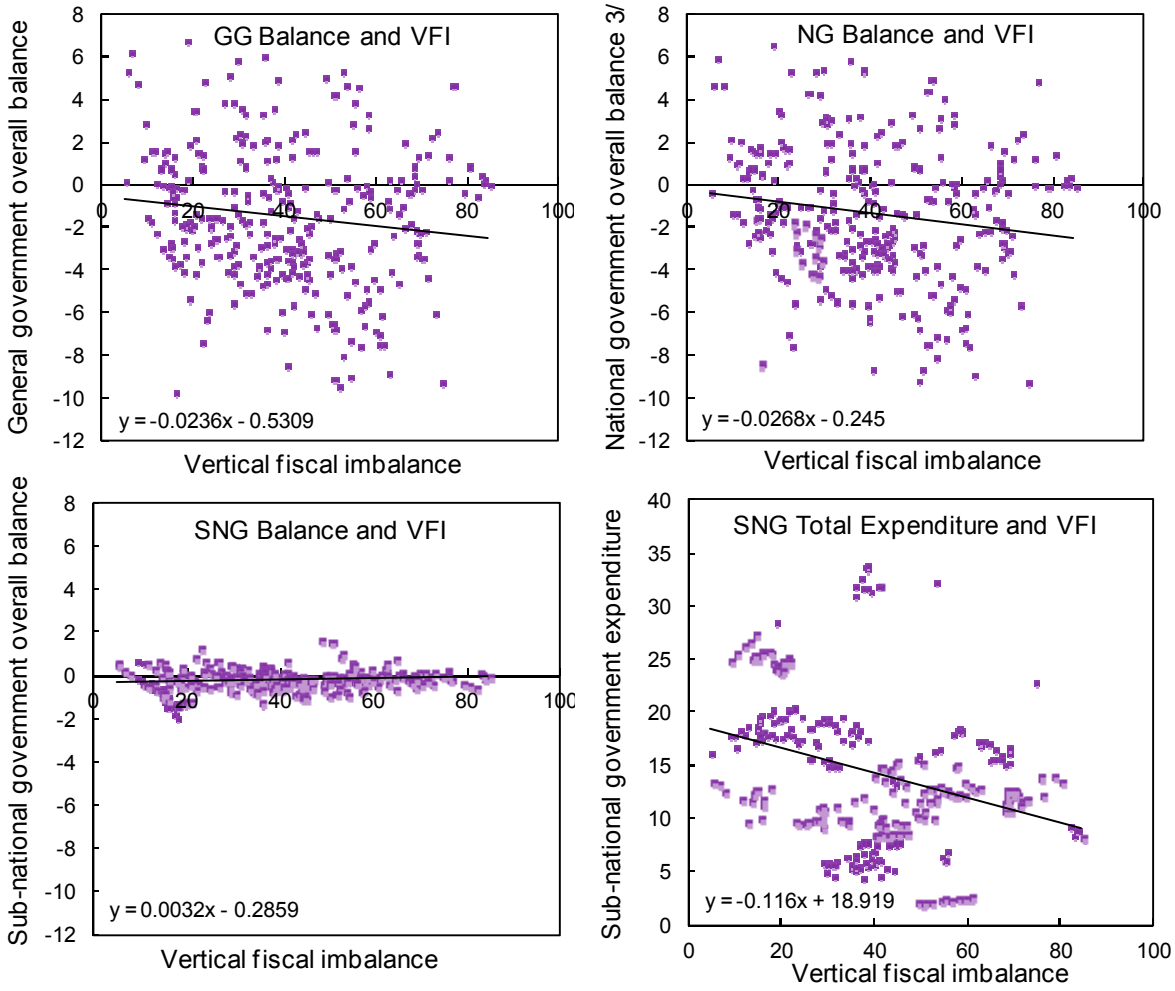
	Expenditure decentralization=> Revenue decentralization	Expenditure decentralization≠> Revenue decentralization
Revenue decentralization=> Expenditure decentralization	CZ, GR, IT, SK, SL, EE	DK, FI, FR, IE, PT
Revenue decentralization≠> Expenditure decentralization	DE, IS, IL, LU, NL, ES, SE, UK, HU	AT, BE, CA, NO, CH

Notes:
1/ Decentralization variables in logarithms; lags=3.
2/ X=>Y: X Granger-causes Y; X≠>Y: X does not Granger-cause Y.
3/ Significant at least at 10 percent significance level.

- **Fact 5. Large vertical imbalances are associated with worst fiscal performance**. Consistent with the literature, the higher the VFI, the lower the fiscal balance of the general government (Figure 4, upper-left). While sub-national budgets are generally close to balance regardless of whether they rely on transfers or own revenues[11], fiscal performance at the national level (central plus social security) deteriorates slightly at higher levels of VFI (Figure 4, upper-right). One explanation could be that large VFIs relax the fiscal discipline of sub-national governments, forcing central governments to bail them out. However, this hypothesis is questioned by the negative correlation between sub-national spending and VFI (Figure 4, lower-right)—a somewhat unexpected result that seems to contradict the findings of the "flypaper-effect" literature. We also find a negative correlation between VFI and overall balance when both series are in first difference, suggesting that the speed at which the VFI varies also matters (results are not reported here).

[11] This result should not be interpreted as reflecting the good performance of sub-national governments, which are usually borrowing-constrained and may receive bailout transfers from the center.

Figure 4. Fiscal Performance and Vertical Fiscal Imbalance 1/
(Percent; average over 1995–2007) 2/



Sources: OECD; and IMF staff estimates.
1/ Vertical fiscal imbalance is defined as the share of sub-national own spending (excluding transfers paid) not financed through own revenue (excluding transfers received).
2/ Fiscal performance variables are in percent of GDP; vertical fiscal imbalance is in percent of sub-national own expenditure.
3/ National government includes central government and social security funds.
4/ GG = General government; NG = National government; and SNG = Sub-national government.

E. Econometric Evidence

Model Specification

20. **To assess the impact of vertical gaps on fiscal performance, we estimate a panel equation relating the general government primary balance to the vertical imbalance, spending decentralization, covariates, and interaction terms.** Our purpose is not to model a full-fledged fiscal policy reaction function but to estimate the partial effect of VFI. We apply the following specification to a sample of 27 OECD countries over 1969–2007 (sample period varies across countries, see Appendix 1, Table 1A):

$$PB_{it} = \alpha \times VFI_{it} + \beta \times Decentralization_{it} + \mathrm{X}_{it} \times \delta + \varphi_i + \tau_t + \varepsilon_{it} \qquad (1)$$

where the indices: i and t denote countries and years, respectively; PB_{it} is the primary balance of the general government as a share of GDP; VFI_{it} is the vertical fiscal imbalance (defined in Section C but we also use "transfer dependency" in the robustness checks); $Decentralization_{it}$ is spending decentralization (sub-national own expenditure as a share of general government expenditure); X_{it} denotes control variables; φ_i represents country-specific fixed effects; τ_t time dummies; and ε_{it} is a time- and country-specific error term. The dependent variable is the headline (unadjusted) rather than the structural balance in order to capture cyclical effects of VFI (consistent with the literature on transfer pro-cyclicality; Rodden, 2009). The inclusion of the output gap in the equation guarantees that direct effects of the cycle are taken into account. We tested the significance of a large set of covariates including: government debt, the output gap, political variables (including federal/unitary state structure), governance indicators, measures of regional disparities (income and unemployment), borrowing constraints, GDP per capita, trade openness, inflation, and demographic variables as well as multiplicative terms (to assess whether the impact of VFI is conditional on the covariates).[12] These variables are described in Table 2A, in Appendix 1.

21. **Two relationships are of particular interest**. They can be explored within model (1) by using multiple regression analysis in order to interpret the coefficients alpha and beta "other factors being equal". We expect a negative alpha and a positive beta based on the results of the economic literature and the stylized facts:

- **Effect of changing the sub-national financing mix:** The coefficient alpha measures the impact of VFI keeping spending decentralization constant. Thus, alpha assesses the effect of a shift in the structure of sub-national financing—from own revenues to

[12] The impact of fiscal rules other than borrowing constraints could not be tested due to data availability constraints for the OECD sample.

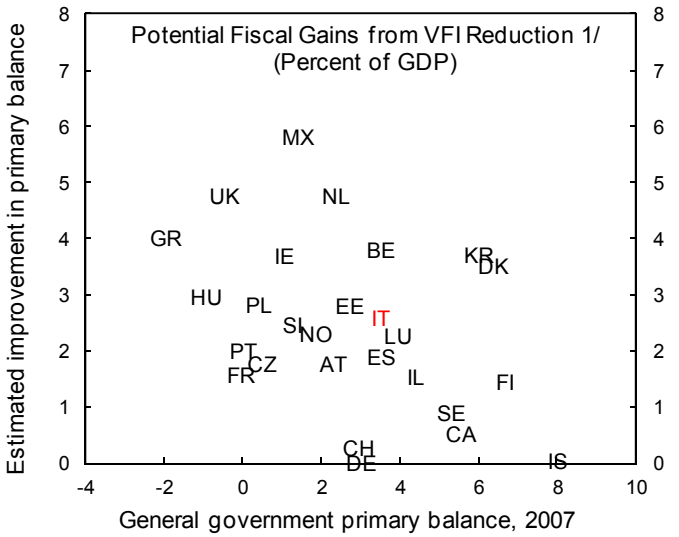
transfer/borrowing—within a given envelope of sub-national spending (as a share of general government spending).

- **Effect of own-revenue financed spending decentralization:** The coefficient beta has a more dynamic interpretation. It evaluates the effect of increasing spending decentralization while keeping VFI constant; beta therefore measures the impact of spending decentralization financed through own revenues.[13]

22. **We intentionally did not include the revenue decentralization in the equation.** As shown in Box 3, when spending and revenue decentralizations are kept constant, a direct accounting relation relates VFI to the fiscal deficit. A regression including all three variables would capture an artificial correlation between VFIs and fiscal performance, other factors being equal.

Main Results

23. **As expected, vertical imbalances negatively affect fiscal performance, while spending decentralization financed from own revenues has a positive effect (Table 2).** Beta is positive and strongly significant in all equations. The impact of the VFI is negative (in the equations with interaction terms, the effect of VFI should be assessed by summing alpha and the coefficients of interactive terms for different values of the covariates). Depending on the specification, the estimated elasticity of the VFI ranges from 0.08 to 0.18, suggesting that a one percent increase in the VFI deteriorates the general government primary balance by 0.1–0.2 percentage points of GDP. Including regional income disparities (HFI) in the equation reduces this elasticity to 0.08 (Table 2, columns 6–7),



Source: IMF staff estimates.
1/ Assumes a reduction in VFI from its 2007 level to the average VFI of the three countries with the smallest VFI (DE, IS, CH). Estimated elasticity of 0.08 is used to derive the impact of VFI reduction on the general government primary balance.

[13] More precisely, this second interpretation would require that the vertical gap be measured as a share of general government spending. In that case, keeping the vertical imbalance constant while increasing spending decentralization would imply that the share of sub-national own revenues in sub-national own spending increases. In the robustness analysis, we propose an alternative equation based on this alternative definition of vertical imbalances, and beta is still found positive.

suggesting that other specifications may suffer from omitted variable bias.[14] We also find a lower estimate in the instrumental variable specifications discussed below.[15] Based on these estimates, the text figure reports the fiscal gain that countries can expect from reducing their current VFI to that of the least imbalanced countries of the sample.

24. **The estimated coefficients of other covariates are consistent with priors.** The debt coefficient is positive, suggesting that fiscal policy incorporates debt sustainability constraints. The output gap (deviation of the actual from potential GDP) has a positive effect, suggesting that fiscal policy is on average countercyclical in the sample. Governance (rule of law) improves fiscal performance, while a presence of large regional income disparities deteriorates fiscal performance. Finally, more trade openness is associated with better fiscal outcomes, reflecting the disciplinary effect of a larger market exposure.

25. **We find some limited evidence that the effect of vertical imbalances is conditional, in particular on the size of horizontal imbalances.** Our estimations show that the effect of VFI is more negative in times of legislative elections (Table 2, column 5), or when sub-national borrowing autonomy is large, consistent with Rodden (2002) (Table 2, column 5), or when regional disparities are sizeable (Table 3, columns 7–8). The latter result is interesting, as it suggests that VFIs and HFIs interact with each other and that their combination could be particularly detrimental to fiscal performance, likely because HFIs aggravate soft budget constraints and bailout anticipations. This result also implies that decreasing VFI has a larger impact on fiscal performance in countries, like Italy, with high HFIs. However, we could not find a general specification including more than two interaction terms, either because they significantly reduce the sample size (for instance, HFIs), or because of potential collineratity problems (between covariates, or between VFI and the interaction terms). We also have some reservations about including the interaction term of spending decentralization and VFI, as it is done in many empirical papers. By construction, this variable is the share of the VFI in general government expenditure, which is highly correlated with the VFI and artificially reduces the statistical significance of the latter variable (Table 2, column 4).

[14] When the regional disparities' variable is omitted, the negative effect of the VFI is overestimated, consistent with the prediction of the econometric theory (in a simple model, the bias on alpha is expected to be negative when the effect of HFIs on fiscal performance is negative, and HFIs are positively correlated with VFIs).

[15] On the other hand, the measurement error (of revenue autonomy by the VFI, see Section III) could result in an underestimation of the coefficient. Indeed, the estimate is biased downward if the measurement error of the explanatory variable is neither correlated with VFI nor with revenue autonomy ("attenuation bias").

Table 2. Vertical Fiscal Imbalance and Fiscal Perfomance

(Dependent variable: General government primary balance, percent of GDP)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VFI 1/	-0.18***	-0.16***	-0.14***	-0.11*	0.16*	-0.08***	0.15**	0.24**
	(-11.46)	(-6.52)	(-5.93)	(-1.94)	(1.73)	(-2.91)	(2.07)	(2.43)
Expenditure decentralization	0.21***	0.17***	0.18***	0.21***	0.21***	0.13**	0.12**	0.23***
	(7.32)	(3.78)	(4.48)	(2.77)	(4.02)	(2.49)	(2.47)	(3.71)
T1997			1.76***	1.78***	1.68***	1.59***	1.55***	1.45***
			(4.20)	(4.23)	(3.61)	(3.63)	(3.54)	(3.42)
T1998			1.49***	1.52***	1.57***	1.40***	1.27***	1.30***
			(3.78)	(3.81)	(3.64)	(3.39)	(3.07)	(3.27)
T1999			1.63***	1.66***	1.62***	1.64***	1.46***	1.47***
			(4.28)	(4.30)	(3.89)	(4.10)	(3.62)	(3.77)
T2000			2.06***	2.09***	1.97***	2.17***	2.31***	2.00***
			(5.46)	(5.47)	(4.68)	(5.14)	(5.74)	(4.87)
Lag debt-to-GDP ratio		0.11***	0.07***	0.07***	0.07***	0.09***	0.10***	0.11***
		(7.12)	(5.29)	(5.13)	(4.87)	(5.28)	(5.51)	(6.01)
Lag of output gap		0.38***	0.33***	0.32***	0.39***	0.54***	0.53***	0.52***
		(4.66)	(4.45)	(4.23)	(4.26)	(5.36)	(5.16)	(5.38)
Openness		0.02*	0.03***	0.03***	0.03**	0.03*		0.04**
		(1.74)	(2.82)	(2.82)	(2.04)	(1.97)		(2.23)
Rule of law		5.77***	5.54***	5.49***	4.75***	5.84***		4.21**
		(4.18)	(4.46)	(4.40)	(3.16)	(2.97)		(2.14)
Regional disparity (HFI) 1/						-10.46**	22.00*	
						(-2.57)	(1.94)	
VFI x Expenditure decentalization				-0.001				
				(-0.54)				
VFI x Borrowing autonomy					-0.004***			-0.004***
					(-2.65)			(-2.66)
VFI x Election					-0.01*			
					(-1.84)			
VFI x Regional disparity (HFI)							-0.67***	-0.23***
							(-3.05)	(-2.95)
Constant 2/	2.15*	-13.49***	-14.17***	-15.38***	-14.17***	-12.95***	-12.50***	-16.35***
	(1.91)	(-4.40)	(-5.09)	(-4.29)	(-4.58)	(-3.19)	(-2.98)	(-4.36)
Combined effect of VFI 3/	-0.18***	-0.16***	-0.14***	-0.11***	-0.12***	-0.08***	-0.08***	-0.13***
	(-11.46)	(-6.52)	(-5.93)	(-5.53)	(-3.99)	(-2.91)	(-2.72)	(-4.15)
Within R^2	0.29	0.31	0.45	0.45	0.47	0.53	0.53	0.57
Between R^2	0.05	0.22	0.23	0.23	0.48	0.24	0.20	0.43
Overall R^2	0.08	0.21	0.24	0.24	0.40	0.44	0.37	0.39
Number of observations	447	260	260	260	200	176	176	175
Number of countries	27	24	24	24	18	19	19	18

Source: IMF staff estimates.

Notes: Annual data over 1969-2007 (sample period varies, see Appendix 1); fixed-effects estimation; t-statistics in parentheses; ***(**, *) = significant at the 1 (5, 10) percent level; T1997-T2000 time fixed effects. See Appendix 1 for the definitions and sources of variables.

1/ Changes in the magnitude and sign of estimated coefficients do not reflect instability of relations; total effect should also take into account interaction terms.

2/ One country fixed effect is excluded from equations.

3/ Combined effect of VFI = (i) VFI coefficient if no interaction term; (ii) VFI coefficient + interaction term coeffiecient(s) at average value of the interacted covariate(s) when significant.

Robustness Analysis

26. **Sensitivity tests confirm the robustness of the results.**[16] First, to control for the stability of the relation and the existence of possible outliers, we estimate the equation over sub-samples or exclude one country at a time. Results remain broadly unchanged. Second, removing time dummies does not significantly affect the estimates. Country-specific fixed effects, on the contrary, should not be excluded, as indicated by Hausman tests. Third, we examine whether the response of the overall balance to the VFI is asymmetric—a result emphasized by the empirical literature on transfers and spending (Gamkhar and Shah, 2007). To do so, we estimate the equation on two sub-samples depending on whether the VFI increased or decreased overtime; results were not significantly different, suggesting that the response is broadly symmetric. Third, to check that the empirical correlation between decentralization and VFI does not alter the results, we exclude the former from the equation and note that the VFI coefficient does not change materially. Finally, we re-estimate our equation with two alternative measures of the VFI (Table 3): the vertical gap as a share of general government (rather than sub-national) spending (columns 1–3) and transfer dependency, defined as the share of net transfers received by sub-national government in sub-national own expenditure (columns 4–6). Our estimates are generally not altered. The signs of the VFI and spending decentralization coefficients remain the same, and the estimated elasticity of transfer dependency is very close to that of the VFI.

27. **We use instrumental variables to correct for the potential endogeneity of the vertical imbalance variable** (Table 3, columns 7–8). VFI may be endogenous with regards to the fiscal balance for several reasons: First, the general government balance and the VFI are related through an accounting relation (Box 2). Second, some unobserved omitted variable such as governance could explain both variables (although this bias is likely to be corrected by the fixed effect estimation). Third, the design of some transfers—matching grants, in particular—entails that spending and transfers are simultaneously determined (Gamkhar and Shah, 2007). Fourth, when transfers are used to bail-out sub-national governments that overspent, a reverse causality goes from fiscal performance to transfers. In order to correct for the potential endogeneity bias, we look for instrumental variables, which should be time-variant (the first stage is a fixed-effects estimation), correlated with the VFI but indirectly related to fiscal performance. Five variables ended up being exogenous, economically relevant and statistically significant in the first stage:[17]

- The share of sub-national health spending in national health spending reflects the role of sub-national governments in the delivery of public goods and services—a determining factor of the tax-grant balance across countries, according to Charbit and Goodspeed (2009). The distribution of competencies between levels of government is unlikely to have a direct effect on fiscal performance, but it impacts the financing mix

[16] Not all robustness checks are reported in the paper.

[17] The results of the first stage regressions are available from the authors upon request.

of sub-national governments: when large social spending responsibilities are transferred to sub-national governments, more transfers from the center are generally needed given that the scope to raise revenues from local taxation is often limited.

- The fiscal autonomy indicator of Hooghe and others (2010) measures the extent to which the legal framework gives regional governments a free hand to tax its population. This factor reduces the need for transfers without being directly related to the overall fiscal balance.
- The population size also affects the reliance on transfers, as large countries generally have to decentralize spending without being able to give equivalent tax responsibilities to sub-national authorities.
- The old-age dependency ratio increases the reliance on transfers, when sub-national governments are responsible for a large share of social spending.[18]
- The lag of the VFI is also used as an instrument, as fiscal performance may impact current but not past VFI.

The two-stage least-squares model reports an estimated coefficient of alpha close to the lower bound of the fixed-effect specifications (0.07–0.13), consistent with the econometric theory.[19]

28. **Lastly, we run the equation separately on general government spending and revenue** to determine whether the negative impact of vertical imbalances is channeled through higher spending or a lower tax effort. Results are reported in Table 4, where we include also some more traditional determinants of government size (columns 3 and 6). We find that the vertical gap increases primary expenditure and decreases revenue but the second effect is slightly stronger. The latter observation is somewhat surprising given that the literature tends to emphasize the spending side (with the "flypaper effect", for instance). The conditional effects of VFI are significant only in the expenditure equation.

[18] This instrument may be weak for countries where health and social assistance are provided by the national government.

[19] In the case of reverse causality, the bias on alpha is expected to be negative, given that alpha is negative and the effect of fiscal performance on VFI is also likely to be negative.

Table 3. Vertical Fiscal Imbalance and Fiscal Performance: Selected Robustness Checks
(Dependent variable: General government primary balance, percent of GDP)

	Fixed-Effects Model; VFI as a Share of General Government Expenditure			Fixed-Effects Model; Transfer Dependency as Alternative VFI Measure			Instrumental Variable Model	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VFI / Alternative measures	-0.53***	-0.29***	-0.27***	-0.11***	0.29***	0.20**	-0.07***	-0.13***
in columns (1)-(6) 1/	(-12.69)	(-4.82)	(-3.95)	(-6.15)	(3.04)	(2.03)	(-2.90)	(-4.08)
Expenditure decentralization	0.46***	0.29***	0.30***	0.19***	0.19***	0.17***	0.12***	0.18***
	(13.09)	(5.36)	(4.81)	(6.18)	(2.94)	(3.26)	(2.68)	(4.34)
T1997		1.87***	1.60***		0.91*	1.78***	2.22***	1.77***
		(4.27)	(3.81)		(1.96)	(3.71)	(4.69)	(4.21)
T1998		1.64***	1.64***			1.80***	1.61***	1.50***
		(4.00)	(4.06)			(4.06)	(3.67)	(3.79)
T1999		1.83***	1.97***			1.84***	1.71***	1.64***
		(4.63)	(4.99)			(4.31)	(4.04)	(4.29)
T2000		2.13***	2.82***		1.95***	2.03***	2.30***	2.08***
		(5.42)	(7.06)		(4.63)	(4.69)	(5.44)	(5.46)
T2001			1.29***					
			(2.91)					
Lag debt-to-GDP ratio		0.06***	0.07***		0.12***	0.06***	0.08***	0.07***
		(4.08)	(4.49)		(6.23)	(4.10)	(6.48)	(5.04)
Lag of output gap		0.30***	0.36***		0.62***	0.40***	0.54***	0.33***
		(3.90)	(3.09)		(5.67)	(4.24)	(7.95)	(4.45)
Openness		0.03**				0.02*	0.02*	0.03***
		(2.35)				(1.70)	(1.84)	(2.79)
Rule of law		5.04***	6.00***			3.60**		5.45***
		(3.96)	(3.20)			(2.27)		(4.27)
Election		-0.40*						
		(-1.73)						
Regional disparity (HFI)			-9.64**		-15.36***			
			(-2.48)		(-3.58)			
VFI x Borrowing autonomy					-0.01***	-0.00**		
					(-3.33)	(-2.35)		
VFI x Election						-0.01**		
						(-2.14)		
Constant 2/	-6.62***	-17.49***	-15.20***	-0.29	-3.25	-12.57***	-6.21***	-14.15***
	(-6.92)	(-5.57)	(-3.95)	(-0.23)	(-1.11)	(-3.95)	(-2.77)	(-5.08)
Combined effect of VFI 3/				-0.11***	-0.08**	-0.06*	-0.07***	-0.13***
				(-6.15)	(-2.17)	(-1.97)	(-2.90)	(-4.08)
Instruments used							Lag VFI; health spending share; fiscal autonomy	Lag VFI; population; dependency ratio
Within R^2	0.33			0.15	0.44	0.44	0.52	0.45
Between R^2	0.04			0.06	0.38	0.49	0.49	0.24
Overall R^2	0.08			0.07	0.31	0.42	0.45	0.25
Number of observations	447	247	176	447	175	200	236	260
Number of countries	27	23	19	27	18	18	21	24

Source: IMF staff estimates.

Notes: Annual data over 1969-2007 (sample period varies, see Appendix 1); fixed-effects estimation; t-statistics in parentheses; ***(**, *) = significant at the 1 (5, 10) percent level; T1997-T2001 time fixed effects. See Appendix 1 for the definitions and sources of variables

1/ Changes in the magnitude and sign of estimated coefficients do not reflect instability of relations; total effect should also take into account interaction terms.

2/ One country fixed effect is excluded from equations.

3/ Combined effect of VFI = (i) VFI coefficient if no interaction term; (ii) VFI coefficient + interaction term coefficient(s) at average value of the interacted covariate(s) when significant.

Table 4. Vertical Fiscal Imbalance, Government Expenditure, and Government Revenue
(Dependent variables are in percent of GDP)

	Dependent variable: General Government Primary Expenditure			Dependent variable: General Government Total Revenue		
	(1)	(2)	(3)	(4)	(5)	(6)
VFI 1/	0.05**	-0.27***	0.05**	-0.07***	-0.11***	-0.08***
	(2.17)	(-3.04)	(2.45)	(-4.80)	(-6.25)	(-5.04)
Expenditure decentralization	-0.25***		-0.28***	-0.03		
	(-5.02)		(-6.32)	(-0.80)		
T1997	-2.18***	-1.39***	-1.44***			
	(-3.84)	(-2.99)	(-2.77)			
T1998	-1.77***		-1.55***			
	(-3.26)		(-3.09)			
T1999	-1.58***		-1.45***			
	(-2.99)		(-3.16)			
T2000	-2.02***		-1.44***			
	(-3.83)		(-3.13)			
Lag debt-to-GDP ratio	0.02*		0.04***	0.09***	0.06***	0.08***
	(1.83)		(2.90)	(10.36)	(6.65)	(9.56)
Lag of output gap	-0.38***	-0.73***		0.10**		
	(-5.24)	(-7.29)		(2.10)		
Real GDP growth			-0.44***			-0.21***
			(-6.05)			(-4.39)
Lag of real GDP growth					0.08*	
					(1.67)	
Lag inflation			-0.33***			-0.16***
			(-5.39)			(-3.77)
Openness		-0.05***	-0.05***	-0.02***		-0.02***
		(-2.75)	(-4.53)	(-3.06)		(-3.08)
Voice and accounatability		-2.68*				
		(-1.87)				
Corruption (higher value=lower corruption)					1.20*	
					(1.97)	
VFI x Regional disparity (HFI)		0.40***				
		(4.14)				
VFI x Borrowing autonomy		0.003**				
		(2.13)				
Constant 2/	47.60***	48.26***	54.92***	44.81***	42.38***	45.85***
	(21.69)	(19.47)	(25.53)	(28.52)	(34.70)	(39.84)
Combined effect of VFI 3/	0.05**	0.07**	0.05**	-0.07***	-0.11***	-0.08***
	(2.17)	(2.05)	(2.45)	(-4.80)	(-6.25)	(-5.04)
Within R^2	0.32	0.36	0.44	0.37	0.25	0.42
Between R^2	0.00	0.01	0.02	0.11	0.44	0.18
Overall R^2	0.01	0.00	0.05	0.06	0.29	0.11
Number of observations	314	181	325	314	275	325
Number of countries	24	18	27	24	27	27

Source: IMF staff estimates.

Notes: Annual data over 1969-2007 (sample period varies, see Appendix 1); fixed-effects estimation; t-statistics in parentheses; ***(**, *) = significant at the 1 (5, 10) percent level; T1997-T2001 time fixed effects. See Appendix 1 for the definitions and sources of variables.

1/ Changes in the magnitude and sign of estimated coefficients do not reflect instability of relations; total effect should also take into account interaction terms.

2/ One country fixed effect is excluded from equations.

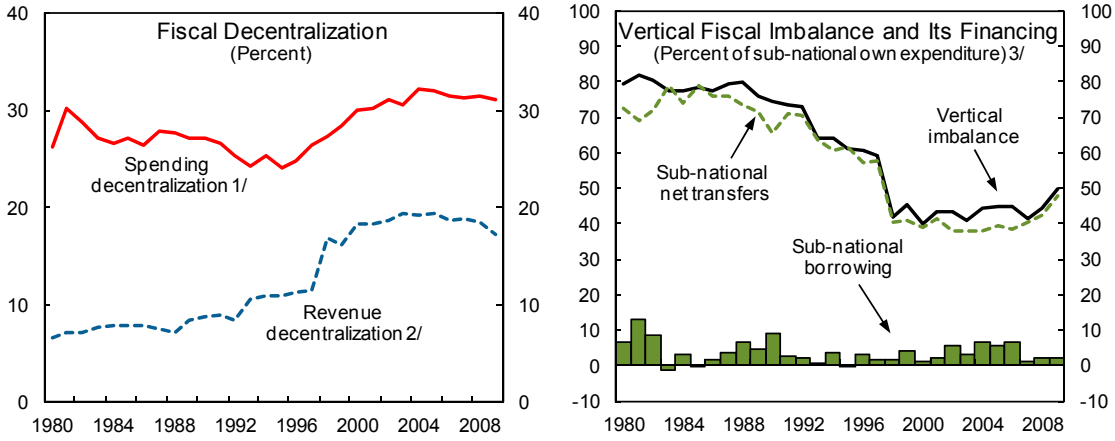
3/ Combined effect of VFI = (i) VFI coefficient if no interaction term; (ii) VFI coefficient + interaction term coefficient(s) at average value of the interacted covariate(s) when significant.

F. Fiscal Federalism Reform in Italy: Straightening the "Crooked Tree" of Italy's Public Finances[20]

Background

31. **The paths of fiscal decentralization and fiscal adjustment cross again at the current juncture of Italy's economic history.** On the one hand, the long-lasting process to deepen fiscal decentralization is gaining impetus in the context of the implementation of the 2009 fiscal federalism framework law. On the other hand, as in most advanced and particularly euro-area economies, strengthening the fiscal position and lowering public debt have become a focus of Italy's economic policy in the aftermath of the recent global financial and sovereign debt crises. Both central and sub-national governments are expected to contribute to the consolidation effort—about one-third of the authorities' 1.5 percent of GDP fiscal adjustment over 2011–2012 is to come from cuts in transfers to sub-national governments.

Figure 5. Italy: Fiscal Decentralization and Vertical Imbalance, 1980–2009



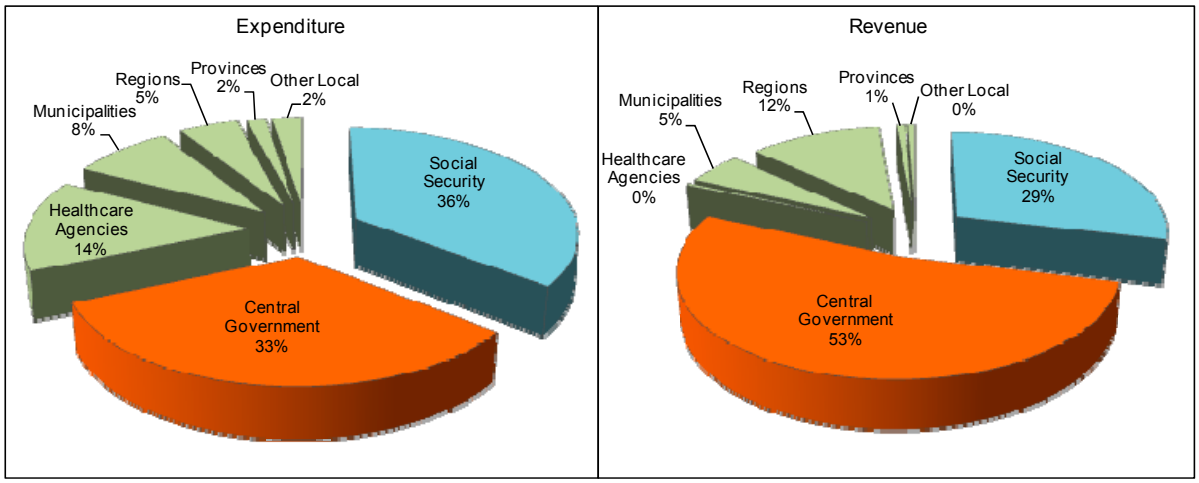
Sources: OECD; and IMF staff calculations.
1/ Share of sub-national expenditure (excluding transfers paid) in general government expenditure.
2/ Share of sub-national own revenue (excluding transfers received) in general government revenue.
3/ Vertical fiscal imbalance is defined as the share of sub-national own expenditure financed with sources other than own revenue (i.e., transfers and borrowing).

32. **Italy's vertical fiscal imbalance remains high, despite a large reduction since the early 1990s.** Expenditure and revenue shares assigned to sub-national governments increased since mid-1990s, though the trend reversed somewhat more recently (Figure 5). In 2005–2009, expenditure (half of the former, on health), while sub-national revenue was less

[20] This section does not aim to provide a full account of past or ongoing decentralization reforms in Italy; rather, it highlights some selected aspects of Italy's long-lasting decentralization process and some recent reform initiatives. A vast literature covers in detail Italy's fiscal decentralization, its shortcoming, and challenges (e.g., Bordignon, 2000; Arachi and Zanardi, 2004; Giarda, 2004; Bibbee, 2007). The government's June 2010 report on fiscal federalism compares Italy's public finances with a "crooked tree" (*albero storto*) in light of the anomalies that emerged over time in the decentralized fiscal framework.

than one-fifth of the general government revenue (Figure 6). Decentralization reforms succeeded to reduce Italy's VFI from over 60 percent in 1995 to about 40 percent in 2007 —one of the largest reductions among the OECD countries (see Section D); still it remained above the OECD average and increased in 2008–2009. The effective taxing power of sub-national governments also remained low (Blöchliger and Rabesona, 2009).[21]

Figure 6. Italy: General Government Expenditure and Revenue by Sub-Sectors, 2005–2009



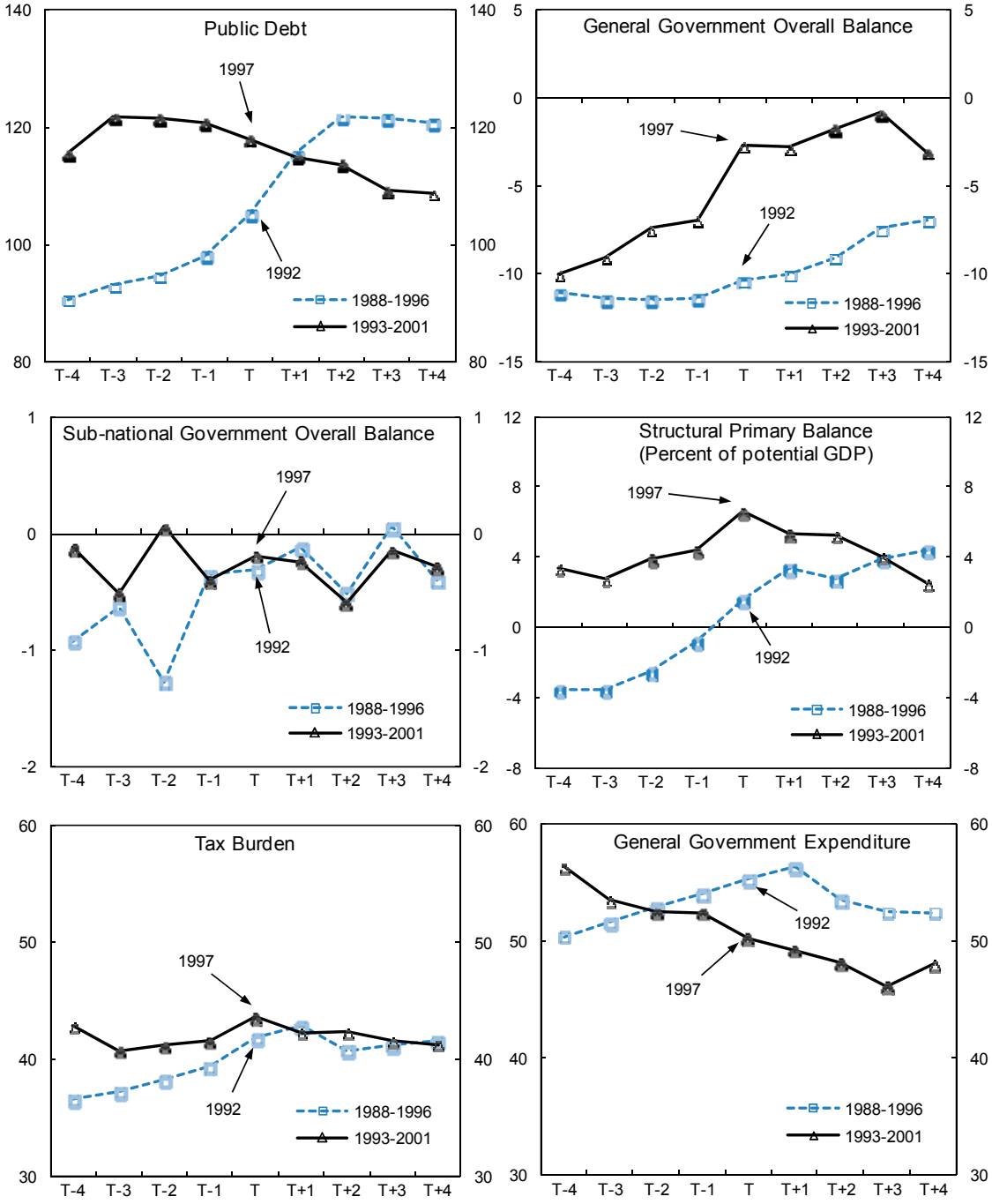
Sources: ISTAT (Conti economici delle Amministrazioni pubbliche); and IMF staff calculations.
Note: For all sub-sectors, expenditure and revenue are net of transfers to other public entities. Interest expenditure is included.

33. **The impact of past decentralization reforms on fiscal performance is difficult to assess.** The devolution of health and other expenditure in the 1970s in the context of a highly centralized tax system was detrimental to fiscal discipline (Ambrosanio and others, 2010), making Italy's case an epitome of the type of problems that a mismatch between spending decentralization and fiscal autonomy could create (Darby and others, 2003). Subsequent major revenue decentralization reforms took place during the ERM crisis (1992) and in the run-up to the euro adoption (1997–1998), making it complicated to disentangle the decentralization impact. Figure 7 documents fiscal developments around the 1992, and the 1997–1998 decentralization reforms. In particular, in the years following the introduction of the IRAP (regional tax on company value added) and the personal income tax surcharge for sub-national governments—which resulted in the large VFI reduction in late 1990s—tax burden and general government expenditure declined, but the overall sub-national government balance worsened, and the fiscal effort (structural primary balance) weakened.[22]

[21] For example, the sub-national governments' power to change the rates of devolved taxes and surtaxes has been restricted in recent years.

[22] Giarda (2004) argues that a decrease in the fiscal unbalance ratio hides the fact that marginal budgetary decisions have not been affected at all by the increase in tax revenues as all sub-national governments remained recipients of equalization grants.

Figure 7. Italy: Fiscal Developments around Selected Major Decentralization Events
(Percent of GDP, unless otherwise indicated)



Sources: WEO; OECD; ISTAT; and IMF staff estimates.
Major fiscal decentralization events referred to in the main text and charts:
1978: Decentralization of health expenditure (not shown as complete fiscal series are not available for pre-1980 period).
1992: Health contributions and automobile taxes are attributed to regions; ICI (property tax) is attributed to municipalities.
1997: IRAP (a new tax on productive activities) is introduced and assigned to regions.
1998: A surcharge on personal income tax, IRPEF, is introduced (0.5 percentage points) for regions and municipalities.

Recent reforms: from "derived" to own-source financing

34. **Addressing the mismatch between sub-national spending responsibilities and taxing powers is a main focus of the ongoing fiscal federalism reform.** The authorities see the VFI as a key distortion in Italy's public finances that has resulted in such problems as: poor quality and inefficiency of public expenditure, especially in the South; proliferation of extra-budgetary activities at the sub-national level; and an increase in VAT sharing which has become a negotiated transfer to cover ex-post health expenditure overruns. To this end, the new decentralized financing model, to be in effect by 2017, envisages nearly complete revenue autonomy for sub-national governments, complemented primarily with shared taxes and equalization transfers.

35. **The recent decrees on municipal and regional federalism aim at increasing sub-national tax autonomy.** The main principle is to replace central transfers with own taxes ("*fiscalizzazione*") while providing also incentives to sub-national governments to enhance their revenue effort (Box 4). The envisaged increase in tax autonomy appears to be modest, at least in the immediate future. Until 2014, municipalities will receive transfers from an experimental equalization fund which will be financed with the taxes to be attributed to municipalities. Primary residence—a key tax base for municipalities—will remain exempted. For regions, the reform increases only marginally tax autonomy, maintaining a strict control of the center.

Box 4. Municipal and Regional Financing Reform: Some Highlights

- **Municipal financing reform** (in effect since April 7, 2011) envisages a substitution of about €11 billion central transfers with own-source revenues and tax-sharing arrangements, including VAT and a flat tax on rental income. The tax system will be simplified, and after 2014, the existing taxes (excluding on primary residence) will be combined in two taxes—municipal own tax (IMU) and secondary municipal tax. To provide further incentives to local governments to engage in the fight against tax evasion, they will receive a larger share of revenue recovered from tax evasion (from the existing 33 percent to 50 percent).
- **Regional financing reform** (approved on March 31, 2011) widens the scope for the regions to increase the personal income tax (IRPEF) surcharge (up to 1.4/2.0/3.0 percent from 2013/2014/2015 against the current base rate of 0.9 percent) and envisages more flexibility in their use of tax deductions. Regions' discretion to lower IRAP is extended (as long as IRPEF surtax is not increased by more than 0.5 percent), and the vehicle tax is attributed to the regions. VAT sharing arrangement will be based on a territorial principle after 2013. Estimates of the amount of transfers that would be replaced with higher IRPEF surtax are not yet available; these are expected to be coordinated with transfer reductions envisaged in the government's July 2010 fiscal adjustment package (for regions, €4.5 billion in 2011). Also, the national IRPEF rate will be reduced commensurately to ensure that the overall tax levy remains unchanged. An equalization fund will be established in 2013.

Some implications from the cross-country empirical analysis

36. **The results from our econometric analysis (Section E) suggest that Italy could benefit from reducing further its vertical imbalance.** In particular, a reduction in Italy's VFI to the levels of the least imbalanced countries—namely, halving the VFI from its 2009 level of 50 percent of sub-national own expenditure (equivalent to about €60 billion of additional own revenue, keeping sub-national expenditure unchanged)—would improve the general government primary balance by about 2–3 percentage points of GDP.[23] Such a large VFI reduction is not unprecedented in Italy, and the potential fiscal gain could be important. However, the authorities envisage a more modest VFI reduction (less than €20 billion substitution of transfers for own taxes),[24] suggesting a possibly smaller fiscal impact. Our results also suggest that the positive effect of VFI reduction on the primary balance is channeled through both lower expenditure and higher revenue. While the authorities expect the reform to yield efficiency gains and expenditure savings, the positive revenue effect would appear in conflict with one of the objectives of the reform, namely not to increase the tax burden.

37. **Large horizontal imbalances are associated with worse fiscal outcomes, and their presence makes the need for a VFI reduction more pressing and beneficial.** Our results suggest that HFIs have a negative effect on fiscal performance. Reducing Italy's large regional economic disparities with structural reforms would thus produce direct fiscal gains. In addition, when HFIs are large, our conditional analysis shows that the positive effect of reducing vertical imbalances is stronger, probably because large regional disparities aggravate the problems generated by vertical imbalances (for instance, overspending related to bailout anticipations).

38. **Fiscal federalism reform, despite its recent progress, is still incomplete in its design and details.** While the purpose of this section is not to look at all aspects of the reform (such as determination of expenditure needs, health sector governance, equalization schemes, fiscal discipline, sanctions/rewards, accounting standards), looking forward, some considerations should be highlighted:

- **Regional disparities and interregional redistribution**: Given that about 80 percent of sub-national expenditure is defined as essential/fundamental, and fiscal capacity should be equalized to meet these expenditure needs, the horizontal equalization fund will be large. Thus, sizeable interregional redistribution will remain, making the

[23] The assumptions are: a range of 0.08–0.13 for the VFI elasticity and a VFI reduction by 25 percentage points.

[24] According to the preliminary estimates reported in the government's *Relazione sul Federalismo Fiscale* (June 30, 2010) and subsequent municipal financing decisions, central government transfers that could potentially be replaced with own taxes are estimated at about €18.6 billion (about €5.6 billion for regions (including the cuts envisaged in the 2010 fiscal adjustment package), €11.2 billion for municipalities (of Ordinary Statute Regions; for 2011), and €1.8 billion for provinces).

question of the design of equalization mechanisms of utmost importance. In this regard, reforms to base equalization mechanisms on more objective/formula-based criteria are welcome and should be rigorously pursued.

- **Tax autonomy and fiscal discipline:** The abolition of the primary residence property tax (in 2008) not only limited the local resources but importantly affected the quality of revenue devolution. Going forward, if local governments continue to rely on taxes and tax-sharing arrangements that are less visible to taxpayers/local voters, this may weaken the disciplining effect of fiscal federalism and VFI reduction.
- **Federalism at variable speed:** Regional differences could be taken into account when designing the new decentralized financing model. Maintaining larger VFI in the regions where the link between fiscal/economic outcomes and voter accountability is particularly weak and/or administrative capacity is low could be necessary to enforce effective central control.
- **Long transition and implementation risks:** The reform process, which is planned to be completed by 2017, has not been smooth, and out of 8 implementing decrees which should have been adopted by end-May 2011, seven were approved as of mid-June.[25] Political factors and technical difficulties (especially, availability of comparable data and harmonization of accounting standards) have been and will continue to be significant.
- **Coordination with concurrent fiscal adjustment efforts:** The 2009 delegation law explicitly states that implementation of fiscal federalism reform should not deteriorate public finances (and not increase the tax burden). For the immediate future, the challenge for the authorities will be to deliver the planned fiscal consolidation (and sustain it beyond the medium term) while numerous transitional arrangements are being introduced in the context of the fiscal federalism reform.

G. Conclusion

39. **This paper provides new evidence on the impact of vertical fiscal imbalances on fiscal performance, focusing on OECD countries.** Our econometric results confirm the widespread view that spending decentralization financed through own revenues is beneficial and that increasing the share of transfers and borrowing in sub-national spending deteriorates the general government balance. Our findings also suggest that the combination of vertical and horizontal imbalances is particularly damaging to the fiscal stance and that reducing the VFI may lower primary expenditure but increase the tax burden.

[25] These include the decrees on sub-national property (*federalism demaniale*), Rome (*Roma capitale*), standard needs of municipalities/city/provinces (*fabbisogni standard*), municipal federalism (*federalismo municipale*), regional federalism and health sector (*federalismo regionale*), infrastructural equalization/regional cohesion (*perequazione infrastrutturale e coesione territoriale*), and harmonizing of accounting/budget systems (*armonizzazione dei sistemi contabili delle regioni e degli enti locali*).

40. **The reduction in vertical fiscal imbalances should be accompanied by more revenue autonomy of sub-national governments.** Revenue autonomy is critical to improving fiscal discipline. That is why reducing VFIs is not just an accounting exercise. For instance, substituting grants for tax sharing may lower the VFI, if tax-sharing is recorded as sub-national tax, without markedly affecting revenue autonomy and improving fiscal performance.

41. **Italy could benefit from reducing further its vertical fiscal imbalance.** Despite a major past reductions in VFI, there is still a sizeable scope for Italy to reduce it further to the levels of the least imbalanced countries. Indeed, such a reduction would imply halving Italy's VFI from its 2009 level of 50 percent of sub-national own expenditure. This would translate, using our econometric estimates, to an improvement of about 2–3 percentage points of GDP in the general government primary balance. However, the current reform plans aim at a more modest VFI reduction, with the implications for the *effective* increase in sub-national tax autonomy still uncertain.

42. **In practice reducing vertical imbalances may be difficult to achieve.** Our results naturally raise three questions:

- **How to boost sub-national revenues, given that local authorities face specific challenges**, including tax competition, tax base mobility, higher administrative costs, and horizontal disparities in revenue-raising capacity? The literature is generally skeptical about the revenue-raising capacity of lower levels of government. Some papers question nonetheless the dogma that sub-national authorities should only rely on benefit taxation and that the largest tax bases cannot be transferred to them (Bird, 1999). Furthermore, not only the magnitude but also the quality of revenue decentralization is important; local taxes should be carefully selected, based on feasibility and efficiency considerations such as the "benefit principle" (tax paid and public services received should be linked).
- **If sub-national own revenues cannot be increased above a certain level, can the transfer system be reformed to become less distortionary?** A large empirical literature suggests that grant and tax sharing design can actually be improved (Bergvall and others, 2006; Blöchliger and Charby, 2008; Blöchliger and Petzold, 2009). Well-designed grants are generally based on objective criteria that cannot be manipulated by sub-national governments. An another cause of inefficiency seems to be the use of the same grant for various purposes, for instance, subsidization grants that simultaneously attempt to equalize, or financing grants that simultaneously attempt to subsidize.
- **Are there other ways to enforce fiscal discipline than raising sub-national tax responsibilities, rationing transfers, or controlling local borrowing?** Additional hard budget constraint mechanisms have come under closer scrutiny, in particular:

financial market and land market discipline, fiscal rules, and adequate political institutions (Ter-Minassian 1997a, 1997b; Rodden and others, 2003).

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Appendix 1. Data Sources and Definitions

Table. 1A.: List of Countries and Data Availability

	Country	Sample period
1.	Austria	1995–2009
2.	Belgium	1985–2009
3.	Canada	1970–2009
4.	Czech Republic	1997–2009
5.	Denmark	1990–2009
6.	Estonia	1997–2009
7.	Finland	1975–2009
8.	France	1995–2009
9.	Germany	1991–2009
10.	Greece	1995–2009
11.	Hungary	1995–2009
12.	Iceland	1995–2009
13.	Ireland	1990–2009
14.	Israel	1995–2009
15.	Italy	1980–2009
16.	Korea	2000–2009
17.	Luxembourg	1990–2009
18.	Mexico	2003–2009
19.	Netherlands	1969–2009
20.	Norway	2002–2009
21.	Poland	2005–2009
22.	Portugal	1995–2009
23.	Slovenia	1995–2009
24.	Spain	1995–2009
25.	Sweden	1993–2009
26.	Switzerland	1990–2009
27.	United Kingdom	1987–2009

Notes: Sample period for OECD (2010a) data; sub-national (state, where applicable, and/or local) fiscal data are not available for Australia (all years); Austria (1988–1994); France (1978–1994); Japan (all years); New Zealand (all years); United States (all years); and Poland (1995–2004); non-oil fiscal and GDP data for Norway (source: IMF).

Table 2A. List of Variables, Definitions, and Sources

Variable	Definition	Source
VFI (vertical fiscal imbalance)	Share of sub-national own expenditure (i.e., excluding transfers paid to other general government units) not financed with sub-national own revenue (i.e., excluding transfers received from other general government units). Sub-national government is a consolidated state (when applicable) and local government. Transfers include both current and capital transfers.	OECD (2010a)
Transfer dependency	Share of sub-national net transfers received in sub-national own expenditure.	OECD (2010a)
Expenditure decentralization	Share of sub-national own expenditure in total general government expenditure.	OECD (2010a)
Debt-to-GDP ratio	General government gross debt (percent of nominal GDP).	IMF (2011)
Output gap	Percentage difference between actual GDP in constant prices and estimated potential GDP.	OECD (2010b)
Governance indicators: Rule of law; Corruption; Voice and accountability	Indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. Values for the years 1997, 1999, and 2001 are interpolated; and 1995 is assumed equal to 1996.	Kaufmann and others (2010)
Election	Dummy variable = 1, if there was a legislative election in this year, and =0 otherwise.	Beck and others (2001)
Regional disparity (HFI)	Weighted coefficient of variation of TL3 regional GDP per capita.	OECD (2009)
Borrowing autonomy	Index measuring six components of borrowing regulations (domestic/international borrowing prohibition; limits on government debt; limits on debt service; limits on borrowing for specific purposes; and Requirements of prior approval from higher levels of government).	Crivelli and others (2010)
Inflation	Percentage change in consumer price index	IMF (2011)
Real GDP	GDP, constant prices.	IMF (2011)
Openness	Share of total exports and imports in nominal GDP.	IMF (2011)
Health spending share	Share of sub-national (state and local) expenditure on health in total general government expenditure on health.	OECD (2010c)
Population	Population, in thousands.	Heston and others (2011)
Dependency ratio	Age dependency ratio (percent of working-age population).	WDI (2010)
Fiscal autonomy	{0,1,2,3,4} index measuring the extent to which a regional government can independently tax its population (with 0 if the central government sets base and rate of all regional taxes; and =4 if the regional government sets base and rate of at least one major tax).	Hooghe and others (2010).

IV. THE LINK BETWEEN SOVEREIGN AND BANKING RISKS IN ITALY[1]

Italian and other euro area banks' CDS spreads have moved closely with sovereign spreads since the beginning of the global financial crisis, possibly reflecting changes in international investors' risk appetite. Starting at the end of April 2010, with the escalation of the European sovereign debt crisis, Italian banks' CDS spreads and security yields have increased more than other euro area banks' CDS spread and bond yields. These relative movements are found to be partly explained by changes in Italian sovereign spreads. Therefore, fiscal discipline would have a positive effect on banks' risk profile and funding costs.

A. Introduction

1. **Italian banks weathered the 2008-09 global financial crisis relatively well.** Thanks to a traditional business model based on on-balance sheet lending-deposit activity and a sound supervisory framework, they did not suffer from abrupt losses. Liquidity remained adequate and, unlike elsewhere, Italian banks used limited government support.

2. **However, spillovers from market turbulence related to the European sovereign debt crisis have affected Italian banks' CDS spreads, stock prices, and bond yields.** While Italy's stock prices have fallen by about 4 percent since end-October 2009, banks' equity prices have suffered particularly heavy losses. The five largest banks' equity prices have plunged by over 30 percent on average from end-October 2009 to mid-May 2011, and their CDS spreads have shot up by almost 100 basis points (bps) over the same period. Italian banks' bond yields have climbed by about 100 bps since early April 2010.

3. **At the same time Italian sovereign spreads widened considerably after the Greek and especially the Irish crisis, reaching pre-euro levels**. During the spring of 2010, as the Greek crisis was unfolding, sovereign spreads increased abruptly mostly because German yields declined. However, the Irish crisis led to an increase in both Italy's government bond spreads and yields. Overall, 10-year sovereign bond yields rose from around 370 basis bps in mid-October 2010 to 460 bps in mid-May 2011. After peaking at almost 200 bps in late November 2010 and early January this year, government bond spreads in mid-May 2011 were around 150 bps, well above pre-Greek crisis levels.

4. **This paper analyses the link between sovereign risks and Italian banks' CDS spreads and bond yields.** Section B reviews movements in banks' CDS and sovereign spreads for Italy and other Euro area (EA) countries. Section C estimates a model of the determinants of changes in Italian Banks' CDS spreads relative to a comparison group of EA banks' CDS spreads. Section D analyzes the impact of sovereign risks on bank bond yields. Section E concludes and draws policy implications.

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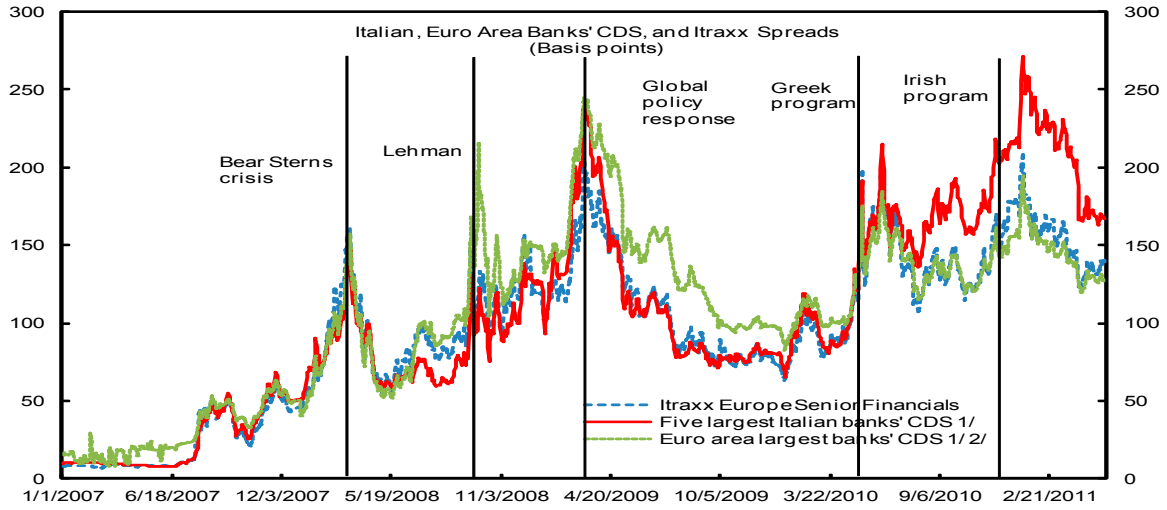
[1] Prepared by Edda Zoli (EUR).

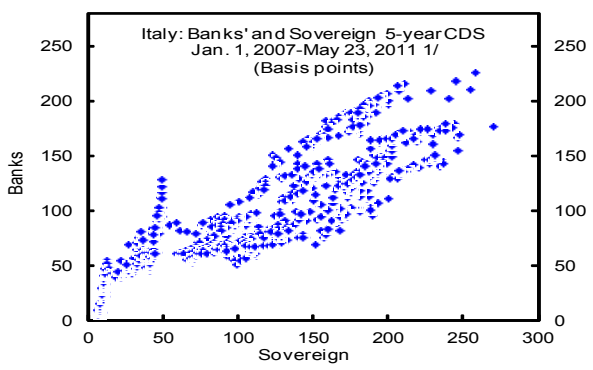
B. Banks' CDS and Sovereign Spreads: Stylized Facts

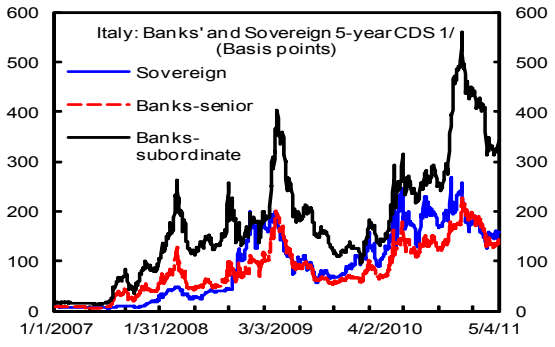
5. **While Italian banks' CDS spreads have been volatile since the onset of the global financial crisis, they have increased especially starting in the spring 2010.** The average CDS spreads of the five largest Italian banks, which had closely tracked the Itraxx Europe senior financial index spreads throughout the global financial crisis, have been higher than then Itraxx index spreads since the past summer. Since then the five largest Italian banks' CDS spreads have also been widening more than the average CDS spreads of the largest EA banks.



Sources: Bloomberg and IMF staff calculations.
1/ Simple average of individual banks CDS spreads.
2/ The selected sample of euro area banks includes Erste, Raiffesein, Dexia, Fortis, KBC, BNP Paribas, Credit Agricole, Societe Generale, Natixis, Deutsche Bank, Commerzbank, ABN Amro, Rabobank, ING Group.

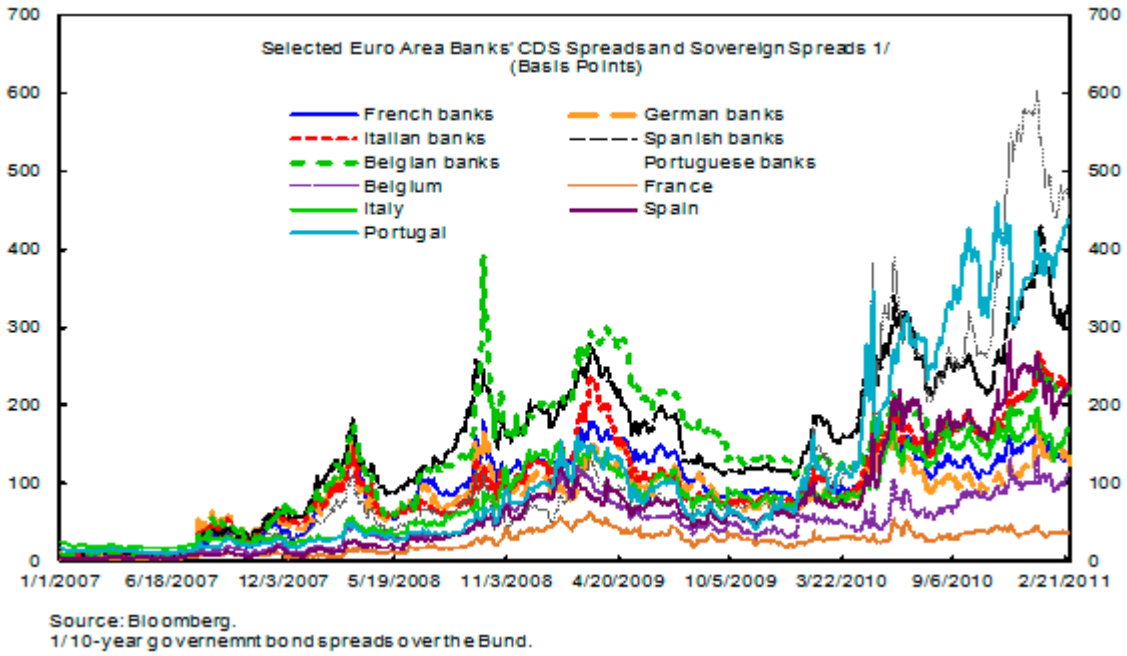
6. **Italian banks CDS spreads have moved closely with Italy's sovereign CDS and bond spreads since the beginning of the global financial crisis.** Sovereign and banks' CDS spreads have been highly correlated especially during periods of financial stress. When spreads were low in the pre-crisis period, the correlation between changes in banks' CDS spreads and changes in the spread of the 10-year Italian government bond over the Bund was small (0.04 during the period January 1, 2006–June 30, 2007). Instead the correlation between the two series increased to 0.5 during July 1, 2007–February 28, 2011.





Sources: Bloomberg; and IMF staff calculations.
1/ Five largest banks average CDS spreads.

7. **Co-movements among banks' CDS and sovereign bonds or CDS spreads have been significant also for other EA countries and banking institutions over the same period.** Throughout the global and European debt crisis, peaks in banks' CDS and sovereign spreads usually coincided, in concomitance with major international event, such as the Bear Sterns' crisis, Lehman Brothers' bankruptcy, and the announcement of the Greek program.



8. **The correlation between banks' CDS and sovereign spreads movements could be due to different reasons.** Following the start of the global crisis, weakness in the financial sector may have become a factor in driving sovereign spreads, especially for governments that committed large public resources to support and guarantee financial institutions (Mody, 2009; Sgherri and Zoli, 2009).[2] On the other hand, shocks to sovereign bond yields and spreads could have an impact on banks' risk profile through different channels. Rating agencies cap bank ratings on the basis of the sovereign rating, thus creating a link between the two. Banks' funding costs tend to rise with government bond yields, trimming down their profitability. Moreover, the decline in government bond prices reduces the value of government securities in the banks' trading book, and even in the banking book if banks need to sell part of the securities before maturity to obtain liquidity. Furthermore, a sovereign with a heightened risk profile has a limited ability to provide support to the banking system, if needed, and makes the banking system appear riskier. A third possible explanation for the

[2] In Ireland, for example, sovereign spreads started to climb after the government extended a guarantee to the banking system in 2008. Mody (2009) finds that while exposure to the financial sector was not an important determinant of sovereign spreads prior to the collapse of Bear Sterns in March 2008, it has become increasingly more significant as the financial crisis progressed. Sgherri and Zoli (2009) show that rising expected default frequencies (EDFs) in the financial sector translated into increases in government spreads in a number of EA countries in late 2008-early 2009.

correlation between banks' CDS and sovereign spread movements is that risk repricing may have contributed to the widening of both banks' and sovereign risk premium differentials at the same time, in a sign of discrimination among different classes of default risk.

9. **The literature on contagion has indeed shown how risk repricing due to changes in investors' risk appetite can transmit shocks across financial instruments.** During periods of financial stress (e.g., the 1997 Asian crisis, the Russian and Long-term Capital management crisis in 1998) spreads widen concurrently. A possible reason is that conditions in financial markets affect international investors' risk appetite —the willingness of each investor to bear risk— and changes in the latter may spread the original shock across financial instruments.[3]

10. **A principal component analysis indicates that movements in EA banks' CDS and sovereign spreads are largely driven by a common factor.** Indeed, over 70 percent of the variance in the EA banks' CDS and sovereign spreads series analyzed is explained by the first principal component.[4] The loadings, representing the contribution of the individual series to the first principal component, are all positive and similar in size, suggesting that the latent factor might be capturing a common risk indicator. The estimated unobserved factor peaked at the time of enhanced strains in the interbank market in the summer of 2007 resulting in widening euro Libor-OIS spreads,[5] around the Bear Sterns' bailout, after Lehman Brothers' bankruptcy, in early 2009, and at the time of the Greek and Irish crisis. Until end-2009 movements in the common component appear to have been correlated with tensions in the interbank market—the trasmission channel of shocks during the first stages of the global financial crisis. Since early 2010, instead, the latent factor seems to reflect regional turbolence related to the European sovereign crisis.

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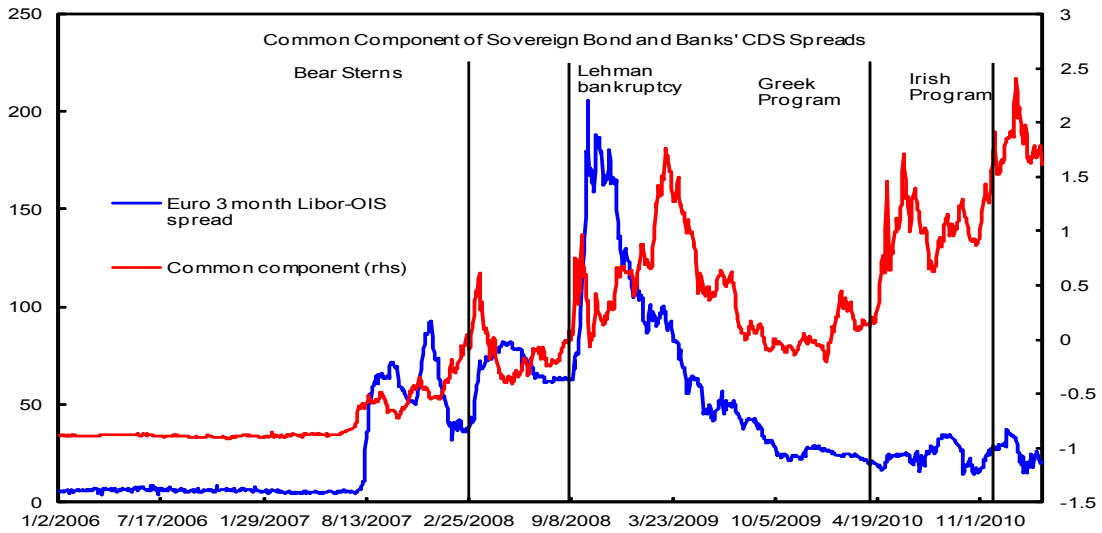
[3] Risk appetite depends on both risk aversion—a "deep" parameter measuring the subjective attitude of investors with regard to uncertainty—and the level of uncertainty itself. Work analyzing the role of risk appetite as a transmission channel of financial crises include for example Kumar and Persaud (2002), and Dungey,Fry, González-Hermosillo and Martin (2003). Papers examining how financial crises transmit across geographical borders and different asset classes comprise, among others, Dornbusch, Park, and Claessens (2000), Pericoli and Sbracia (2003), and Dungey et al. (2003, 2005, 2006, 2007, 2011).

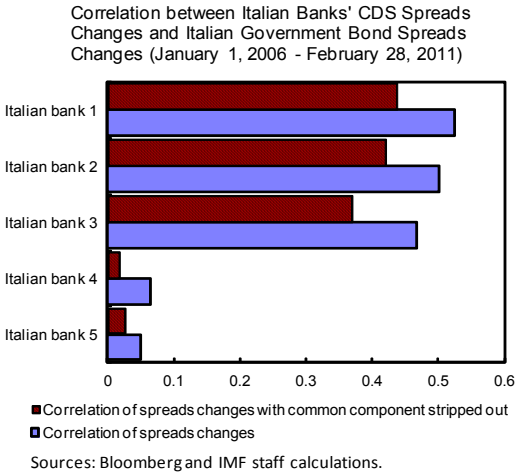
[4] The series included in the principal component analysis comprise the spreads of 10-year government bonds over the Bunds of Austria, Belgium, Finland, France, Greece, Ireland, Italy, Netherlands, Portugal, and Spain, and the 5-year CDS spreads of the following EA banks: Erste, Raiffesein, Dexia, Fortis, KBC, BNP Paribas, Credit Agricole, Societe Generale, Natixis, Deutsche Bank, Commerzbank, ABN Amro, Rabobank, ING Group, Intesa San Paolo, Unicredit, Monte dei Paschi, Banco Popolare, Unione Banche Italiane, Alpha bank, Banco Espirito Santo, Banco Comercial Portugues, Banco Popular Espagnol, Banco Santander, Banco Bilbao Vizcaya Argenta, Caja Madrid, Caixa, Allied Irish Bank, Anglo Irish, Bank of Ireland. All series were standardized before computing the principal component.

[5] Libor stands for London interbank offered rates, and the OIS for overnight index swap rates. The spreads between these two interest rates is considered a measure of distress in the interbank market.



Sources: Bloomberg and IMF staff calculations.

11. **The correlations between Italian banks' CDS and sovereign spreads are robust even taking into account the common risk component**. Examining cross-correlations of spreads where the common risk component has been stripped out (red bars in the chart), suggest volatility spillovers between Italian banks' and sovereign spreads for three of the largest banks.[6]



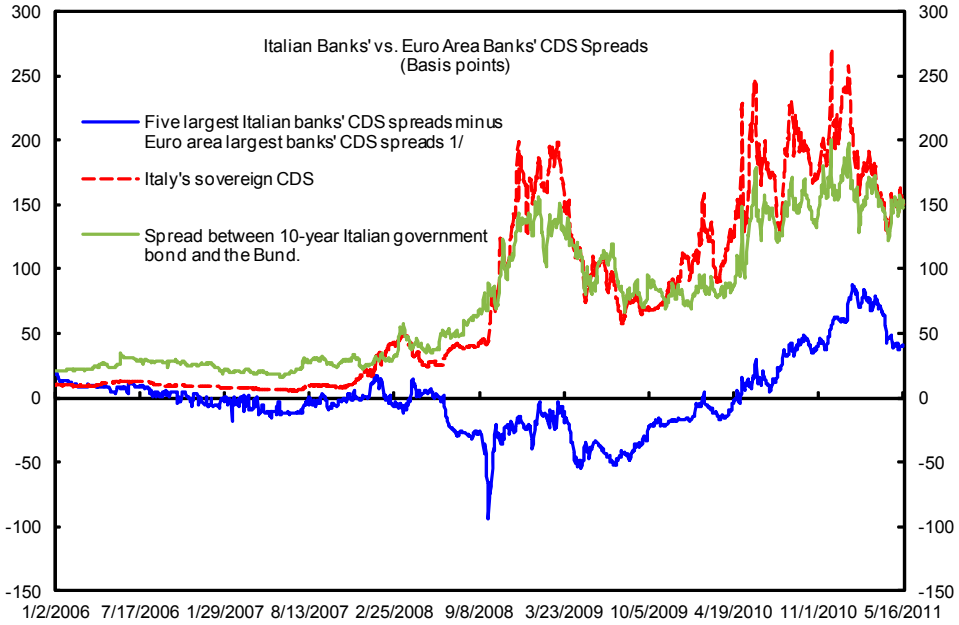
Sources: Bloomberg and IMF staff calculations.

C. The Movements in Italian Banks' CDS Spreads Relative to EA Bank CDS Spreads

12. **Italian banks' CDS spreads have recently increased compared to other EA banks' CDS spreads.** Given the common movements among euro banks' CDS spreads, to understand how the perception of Italian banks' risk profile has changed over time, it seems more appropiate to focus on the differential between Italian banks' CDS spreads and the CDS spreads of other EA banks, rather than on changes in Italian banks' CDS spreads *per se*. It appears that before and throughout the global financial crisis, the CDS spreads of the five largest Italian banks remained very close, and even below, those of a selected group of large

[6] To strip out the common component, changes in individual banks CDS and government bond sovereign spreads were first regressed on changes in the first principal component. Then "adjusted" spreads series were computed as the difference between the original series and the common component multiplied by the estimated coefficient.

EA banks.[7] However, starting at the end of April 2010, with the escalation of the European sovereign debt crisis, the differential between Italian and EA banks' CDS spreads became positive and widened. Italian banks' CDS spread differential vis- à-vis other EA banks' seems also to have become more correlated with Italian sovereign spreads over time. Indeed, the correlation between changes in sovereign CDS spreads and changes in the CDS spreads of the largest Italian banks relative to other EA banks was very small —0.1— during the period January 2006-end-March 2010, but it increased to 0.4 in the following period.



Sources: Bloomberg and IMF staff calculations.
1/ Average of the five largest Italian CDS spreads minus average of the CDS spreads of a group of euro area banks. Euro area banks in the sample are Erste, Raiffesein, Dexia, Fortis, KBC, BNP Paribas, Credit Agricole, Societe Generale, Natixis, Deutsche Bank, Commerzbank, ABN Amro, Rabobank, ING Group.

13. **Against this background, an econometric model is estimated to explain movements in the CDS spreads of Italian banks relative to those of other EA banks.** The sample consists of daily observations covering the period January 1, 2006-February 28, 2011. The dependent variable is 5-year CDS spreads of each of the five largest Italian banks minus the average CDS spreads of a group of EA banks.[8] The explanatory variables include the lagged dependent variable and the 5-year Italian sovereign CDS spreads or the 10-year government bond spreads over the Bund (lagged).[9] The bid-ask spreads of each bank's CDS

[7] The EA banks included in the comparison group are Erste, Raiffesein, Dexia, Fortis, KBC, BNP Paribas, Credit Agricole, Societe Generale, Natixis, Deutsche Bank, Commerzbank, ABN Amro, Rabobank, ING Groep. The list excludes Greek, Irish, Portuguese, and Spanish banks.

[8] See footnote 7 for the list of banks included in the group.

[9] While the possible reverse causality between banks' CDS and sovereign spreads is not fully solved by entering the sovereign spread as a regressor with a lag, the problem is probably not too serious in the case of Italian banks, as they have received little government financial support during the financial crisis. Also, Granger

(continued)

premium are also introduced among the regressors, as an indicator of liquidity of the bank's CDS. The wider is the bid-ask spread, the higher is the liquidity risk. Additional explanatory variables are a dummy for bad news and a dummy for good news related to important international events in connection with the global and European sovereign crisis (e.g., the approval of the Irish and Greek programs).[10] The implied volatility index of the German stock market (VDAX index) is used as a proxy for general risk aversion.[11] The euro 3 month Libor-OIS spread is also added among the explanatory variables as a measure of counterparty risk in the interbank market. All variables are differenced, with the exception of the bid-ask spread, which is stationary. Estimates are carried out using the seemingly unrelated regression method.

14. **As a variation to the basic estimation model, lagged changes in sovereign spreads are also interacted with a measure of individual bank capital**, to assess whether sovereign risks have a bigger impact on institutions with lower capital levels. Specifically, the measure of bank capital is the ratio between the average tier-1 of the EA banks comparison group and the tier-1 of the individual Italian banks. Also, in an alternative model Italian government bond yields are used as regressors instead of sovereign spreads.

15. **Estimates indicate that changes in sovereign spreads have had a significant impact on the CDS spreads differential of four large Italian banks respect to a group of EA banks**.[12] Even when a dummy variable for the period following the excalation of the Greek crisis in early May 2010 is added to the regressors, the coefficients of the sovereign spread variable remain significant, indicating that perceived hightened risk in the Italian sovereign ―and not the European sovereign crisis―contributed to the increase in Italian banks' CDS spreads relative to other EA banks' CDS spreads. The interaction term between sovereign spreads and bank capital has also a positive and significant coefficients for four Italian banks in the sample, suggesting that that the impact of sovereign risk on bank risk is larger for institutions with relatively lower capital levels (Table 1). On the other hand, government bond yields do not have a significant impact on Italian banks CDS spreads differential. The VDAX index is found to have a statistically significant effect on the dynamics of three banks CDS , suggesting that investors demand higher credit risk premiums on some Italian banks more than other European banks when risk aversion increase. Also, bad news related to the European sovereign debt crisis have also affected some Italian banks more that other EA banks. On the other hand, tensions in the interbank market, as measured by the Libor-OIS spreads do not appear to have increased Italian banks' CDS spreads relative to other EA banks. In some cases the good news variable is found to have positive and significant coefficient, possibly indicating that in the aftermath of positive events related to

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causality tests suggest that changes in sovereign spreads drive changes in individual banks' CDS spreads relative to other EA banks, and not the other way around.

[10] The Appendix provides the list of events captured by the dummies.

[11] In principle the common component of banks' CDS and sovereign spreads could be used as an indicator of risk aversion. However, given that it is highly correlated with sovereign spreads, these two variables cannot both be included as explanatory variables in the same regression.

[12] Similar results are obtained regardless of whether sovereign CDS spreads are or 10-year government bond spreads to the Bund are used as regressors.

the global and European sovereign debt crisis other EA banks' CDS spreads decline more than those on Italian banks. This may be due to the fact that other EA banks, more exposed to Greece and Ireland, may have benefited more from the positive news concerning the sovereign debt crisis.

Table 1. Determinants of Changes in Italian Banks' CDS Spreads Relative to Euro Area's Banks' CDS Spreads

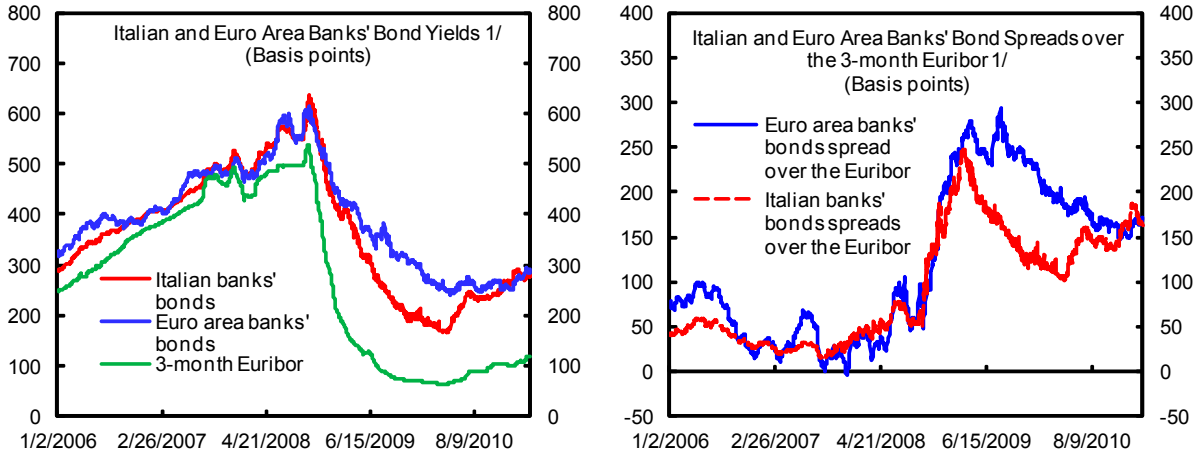
	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5
Constant	0.24	-0.02	0.43	-0.38	-0.60	0.24	-0.03	0.43	-0.44	-0.60
P-value	*0.13*	*0.83*	*0.02*	*0.26*	*0.27*	*0.13*	*0.80*	*0.01*	*0.18*	*0.28*
Bid-ask spread	**0.05**	**0.01**	**0.07**	0.03	0.06	**0.05**	**0.01**	**0.07**	0.04	0.06
P-value	*0.05*	*0.00*	*0.01*	*0.26*	*0.22*	*0.04*	*0.00*	*0.01*	*0.18*	*0.23*
D(VDAX)	**0.20**	**0.31**	**0.20**	-0.58	-0.72	**0.19**	**0.30**	**0.20**	-0.60	-0.72
P-value	*0.00*	*0.00*	*0.00*	*0.50*	*0.23*	*0.00*	*0.00*	*0.00*	*0.60*	*0.18*
D(Sovereign spread(-1))	0.04	**0.13**	**0.13**	**0.39**	0.00	-0.02	**0.08**	**0.09**	**0.21**	-0.02
P-value	*0.12*	*0.00*	*0.00*	*0.00*	*0.94*	*0.46*	*0.01*	*0.00*	*0.00*	*0.75*
D(Libor-OIS spread(-1))	-0.04	-0.05	-0.07	0.02	**0.13**	-0.04	-0.05	-0.07	0.01	0.01
P-value	*0.28*	*0.20*	*0.09*	*0.81*	*0.07*	*0.10*	*0.13*	*0.09*	*0.87*	*0.60*
Good news	-0.03	-2.15	-1.12	**8.12**	**6.59**	0.26	-1.89	-0.98	**8.96**	**6.65**
P-value	*0.98*	*0.06*	*0.31*	*0.00*	*0.07*	*0.79*	*0.09*	*0.40*	*0.00*	*0.00*
Bad news	**8.68**	**2.88**	**11.70**	-0.68	-5.07	**8.60**	2.83	**11.65**	0.68	-5.12
P-value	*0.00*	*0.08*	*0.00*	*0.82*	*0.10*	*0.00*	*0.08*	*0.00*	*0.78*	*0.61*
D(Dependent variable(-1))	**-0.07**	**-0.07**	**-0.08**	**-0.12**	**-0.03**	**-0.08**	**-0.08**	**-0.08**	**-0.11**	**-0.11**
P-value	*0.00*	*0.00*	*0.00*	*0.00*	*0.29*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
D(Sovereign spread(-1)) *relative capital	-	-	-	-	-	**0.05**	**0.04**	0.02	**0.15**	0.01
P-value						*0.00*	*0.01*	*0.07*	*0.00*	*0.61*
Adj. R^2	0.03	0.1	0.1	0.1	0.1	0.04	0.1	0.1	0.1	0.1
N. Observations	1343	1343	1343	1343	810	1343	1343	1343	1343	810

Source: IMF staff calculations.

D. Sovereign Risks and Bank Funding Costs

16. **Italian banks' funding costs have been rising since the spring 2010.** Yields on bonds issued by the five largest Italian banks have been moving in line with the yields on bonds issued by other EA banks and with the Euribor up to early 2009.[13] After then, yields on Italian banks' securities have fallen more than those on bonds issued by the comparison group of EA banks (which excludes Greek, Irish, Portuguese, and Spanish banks). However, starting in April 2010, yields on Italian banks' securities have been climbing. Correspondingly, the spread of Italian banks' security yields over the Euribor tightened from early 2009 to April 2010, and widened afterwards, whereby for other EA banks the spread over the Euribor has been narrowing for almost the entire period following the peak in early 2009.

[13] Portfolios of debt securities issued by Italian and other EA banks were constructed using bonds broadly comparable in terms of maturity and seniority.



Sources: Bloomberg, Datastream; and IMF staff calculations.
1/ Average yields of bonds issued by the five largest Italian banks, and average yields of bonds issued by a group of euro area banks. Euro area banks in the sample are Erste, Raiffesein, Dexia, Fortis, KBC, BNP Paribas, Credit Agricole, Societe Generale, Natixis, Deutsche Bank, Commerzbank, ABN Amro, Rabobank, ING Group.

17. **An econometric model is estimated to assess whether movements in Italian banks' bond yields relative to other EA banks' security yields is driven by perceived sovereign risks.** The dependent variable is the yield of each of the five largest Italian banks minus the average yield of a group of EA banks.[14] The explanatory variables include the lagged dependent variable, the 5-year Italian sovereign CDS spreads or the 10-year government bond spreads over the Bund (lagged), the dummy for bad news and a dummy for good news related to important international events, the VDAX index. Lagged changes in sovereign spreads are also interacted with a measure of individual bank tier-1 capital relative to the average tier-1 of the EA bank comparison group. Again, estimates are carried out using the seemingly unrelated regression method.

18. **Estimates suggest that, for the five largest Italian banks, changes in sovereign spreads have had a significant impact on the bond yield differential vis-à-vis a group of EA banks.** On the other hand, the interaction term between sovereign spreads and bank capital has a positive and significant coefficient only for one of the five Italian banks in the sample. The coefficient on the VDAX index has the expected positive sign and is statistically significant for four banks. The positive and significant coefficient of the good news variable for three banks again may indicate that in the aftermath of positive events related to the global and European sovereign debt crisis the yields on bonds issued by other EA banks decline more than the yields on bonds issued by Italian banks.

[14] See footnote 7 for the list of banks included in the group.

Table 2. Determinants of Changes in Italian Banks' Bond Yields Relative to Euro Area's Banks' Bond Yields

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5
Constant	-0.05	-0.07	0.02	0.06	-0.02	-0.05	-0.08	0.02	0.06	-0.02
P-value	*0.84*	*0.71*	*0.89*	*0.78*	*0.94*	*0.83*	*0.68*	*0.88*	*0.79*	*0.94*
D(VDAX)	-0.37	**0.26**	**0.20**	**0.35**	**0.40**	-0.36	**0.24**	**0.20**	**0.36**	**0.40**
P-value	*0.26*	*0.01*	*0.01*	*0.00*	*0.00*	*0.30*	*0.01*	*0.01*	*0.00*	*0.00*
D(Sovereign spread(-1))	**0.19**	**0.10**	**0.15**	**0.13**	**0.21**	**0.35**	-0.01	**0.16**	**0.14**	**0.19**
P-value	*0.00*	*0.03*	*0.00*	*0.03*	*0.00*	*0.00*	*0.85*	*0.00*	*0.07*	*0.02*
Good news	**12.39**	**5.36**	**4.73**	0.44	2.03	**11.60**	**6.08**	**4.61**	0.46	2.17
P-value	*0.00*	*0.02*	*0.00*	*0.88*	*0.54*	*0.00*	*0.01*	*0.01*	*0.87*	*0.51*
Bad news	-3.13	-0.30	-1.69	-0.14	1.62	-2.79	-0.65	-1.64	-0.19	1.56
P-value	*0.26*	*0.89*	*0.28*	*0.96*	*0.61*	*0.32*	*0.77*	*0.30*	*0.94*	*0.62*
D(Dependent variable(-1))	**-0.25**	**-0.24**	**-0.21**	**-0.38**	**-0.44**	**-0.24**	**-0.24**	**-0.21**	**-0.37**	**-0.44**
P-value	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
D(Sovereign spread(-1)) *relative capital	-	-	-	-	-	-0.13	**0.10**	-0.01	0.00	0.02
P-value						*0.80*	*0.00*	*0.51*	*0.90*	*0.66*
Adj. R^2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2
N. Observations	1343	1343	1063	1326	1343	1343	1343	1063	1326	1343

Source: IMF staff calculations.

E. Conclusions and Policy Implications

19. **The relation between banking and sovereign risk is very complex**. Banks' vulnerabilities may affect sovereign risks. At the same time, increasing sovereign spreads and yields may have an impact on banks' risk profile. Also, both bank and sovereign risk premium differentials may be driven by investors' risk repricing. Indeed, movements in EA banks' CDS and sovereign spreads are found to be partly driven by a common component, possibly reflecting changes in international investors' risk appetite.

20. **Despite movement communalities, Italian banks' CDS spreads have increased more than other EA banks' CDS spreads since the escalation of the Greek crisis in April 2010.** The empirical analysis presented in the paper suggests that changes in sovereign spreads have been a significant determinant of the CDS spread differential of three large Italian banks with respect to a group of other EA banks. There is also some evidence that the impact of sovereign risks on perceived bank risk is larger for institutions with relatively lower capital levels.

21. **Since April 2010, yields on Italian banks' securities have also been climbing more than those on bonds issued by other EA banks.** Again, the econometric analysis indicates that changes in sovereign spreads have contributed to these relative movements.

Overall, then, the analysis suggests that Italian sovereign risks have a significant impact on domestic banks. This may be due to the fact that Italian banks hold large amounts of government bonds, and also to the fact that banks' ratings (and therefore their perceived risk profile and funding costs) are linked to that of the Italian sovereign.

22. **Since the onset of the global financial crisis, and especially with the eruption of the European debt crisis, financial markets have been increasingly discriminating among government issuers by requiring higher sovereign risk premiums**. The recent rebound in EA sovereign spreads differentiation is noticeable especially from a historical perspective, as it follows a prolonged period of very modest differentiation across countries between 1999 and late 2008. In fact, ever since the introduction of the single currency, the remarkable compression of sovereign risk premium differentials has raised doubts about financial markets' ability to provide fiscal discipline across EA members.

23. **Renewed investors' discrimination among sovereign issuers, together with the empirical evidence on the impact of sovereign risks on the banking sector, are compelling from a policy viewpoint.** As going forward heightened financial markets' discrimination among sovereign issuers is likely to persist, a credible commitment to long-run fiscal discipline is essential not just to hold down government financing costs and reduce vulnerabilities, but also to contain banking risks and funding costs. Furthermore, as the analysis indicates that the impact of sovereign risks on banking risk is larger for institutions with relatively lower capital levels, shoring up banks' capital is also important to strengthen bank resilience against sovereign shocks.

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Appendix I: Construction of the Dummy Variables Capturing Good and Bad News

Bad news:

- Bear Stearns bailout (March 14, 2008)
- Lehman bankruptcy (September 15, 2008)
- G-7 meeting fails to address Greek debt problem (February 7, 2010)
- EU-IMF €45 billion program on Greece announced (April 11 2010)
- S&P downgrades Greece and Portugal (April 27, 2010)
- ECB disappoints expectations that it will step in to support the sovereign debt market and Moody's Investors Service warns that European banks could be affected by the Greek banking system's woes. (May 6, 2010)
- French and German governments agree to take steps that would make it possible to impose haircuts on government bonds (October 28, 2010)
- Ireland requests EU-IMF program (November 21 2010)
- EU-IMF Irish program announced (November 28 2010)
- EU Commission issues a consultation paper on a draft directive that would give regulators sweeping powers to restructure debts of failing banks (January 6, 2011)

Good news:

- Italy approves a law granting the government the possibility to recapitalise distressed banks (October 8, 2008)
- The government approves a law to inject capital into sound banks (November 28, 2008)
- At G-20 Finance ministers meeting IMF funding is boosted (March 15, 2009)
- Enlarged €110 bln package for Greece announced (May 2, 2010)
- €750 bln European Financial Stability Facility is created (May 9, 2010) and the Governing Council of the ECB decides on several measures to address tensions in

financial markets (Securities Markets Program and a fixed rate tender procedure with full allotment in the regular three-month longer-term refinancing operations in May and June 2010).

- European bank stress test results are published (23 July 2010)

- Finance ministers make clear that burden sharing would apply only to bonds issued after 2013 (November 12, 2010)

- ECB announces that it would continue to provide exceptional liquidity support via three months financing at fixed rates with full allotment until April 2011 (December 2, 2010)

- The European Commission says the size of the European Financial Stability Facility must be reinforced and its application expanded (January 12, 2011)

- EA finance ministers agree to provide €500 bln for a new permanent crisis fund (European Stability Mechanism) that will come into force in 2013 (February 14, 2011)