VALUE INVEST

by Valuation & Research Specialists

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Issue 2, 2nd Semester 2008

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Innovative Business Ideas

The second issue of the Value Invest Magazine coincides with Valuation & Research Specialists (VRS) having extended their know how on valuing innovative corporate entities not only in Greece but also abroad. Since our previous issue, VRS valued a number of companies operating domestically as well as internationally in sectors such as real estate, services, sports tourism and energy.

In the real estate market, we advised a commercial property developer on the fair value they should target entering the Greek stock market. The IPO was completed successfully despite the adverse market conditions and the tumbling equity markets.

In the sports tourism sector, VRS expanded its consulting services to domestic municipalities on valuing sports tourism projects and assessing their viability.

We also produced the valuation report for a number of wind and photovoltaic energy projects on behalf of an International Renewable Energy Fund with a broad portfolio of energy parks in several European countries.

Finally, we undertook the feasibility studies and valuation of a floating car park station in Greece and a floating 5 star hotel in Bahrain that will also be energy autonomous using photovoltaic panels.

Nicholas I. Georgiadis
Christophoros J. Makrias
Panayiotis L. Zarifis

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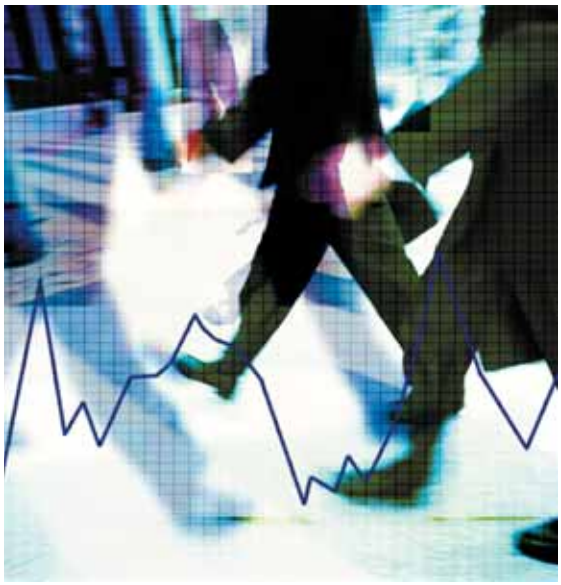
Greek Economy & Equities

Quarterly Review, April 2008

The Greek Economy



Real GDP decelerated to 3.6% in Q4 2007, in the midst of the international financial turmoil, rounding up to 4.0% for the year as a whole, slightly below the 4.2% growth in 2006, but still well above the one recorded in the euro area (2.6%). Economic expansion was primarily driven by robust, albeit decelerating, growth in private consumption and investment. The external sector continued to negatively contribute to GDP growth, despite the strong rise in exports of goods and services.

Main economic indicators Greece (annual % change)

	2005	2006	2007	2008
GDP at constant prices	3.8	4.2	4.0	3.6
Private Consumption	4.2	4.2	3.1	3.2
Public Consumption	1.4	-0.7	3.2	2.9
Gross fixed capital formation	0.9	12.9	5.9	6.6
Exports (goods and services)	2.7	5.1	7.6	5.6
Imports (goods and services)	0.5	8.7	6.1	6.6

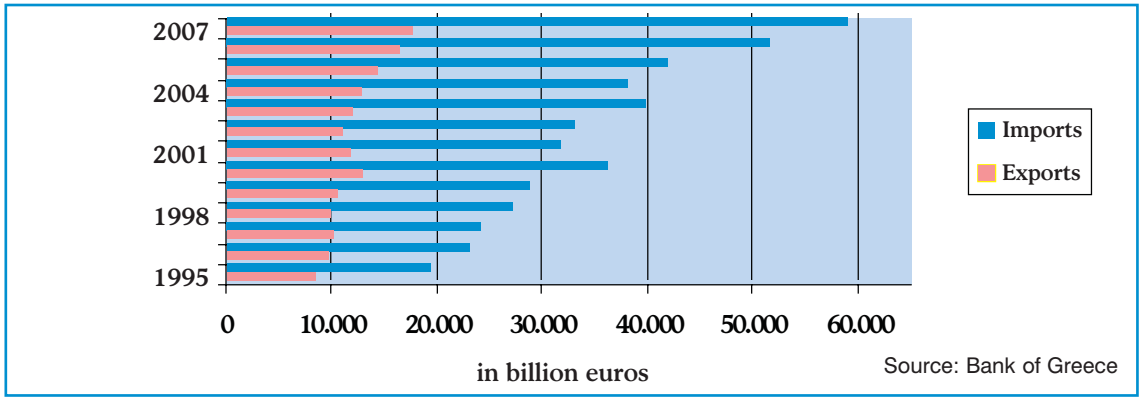
Sources: European Commission, national sources, Dynamic Securities SA.

The impact of the international financial turmoil on the Greek financial sector and the real economy has been so far limited and mainly indirect. The exposure of the Greek banks to foreign sub-prime mortgage-backed securities has been negligible, thus there have been no important devaluations and write-offs of assets and, in this

respect, no losses in most of the banks' balance sheets. The effects have been more pronounced in the money and capital markets. Interbank lending rates have increased (the 3-month EURIBOR climbed to 4.72% in Q4 2007), but the Greek banking sector has not suffered from severe short-term liquidity problems. The time deposit rates and the lending rates for most categories of loans have also increased. The credit conditions to consumers and firms have tightened and the lending standards have become stricter, but given the intense competition in the Greek banking sector, part of the effects of the increased cost of funding is expected to be absorbed by the banks and not rolled-over to the borrowers. In the capital market, the process of risk reassessment and flight to safety on the part of the investors has resulted in decreasing bond returns, while the stock market has been characterized by high volatility and a falling trend in prices.

Looking ahead, the uncertainty surrounding the economic growth, especially in the advanced economies, remains elevated, affecting the level of confidence and the economic decisions of consumers and investors. In March 2008, the Greek government revised downwards its near-term macroeconomic projections of the Stability and Growth Programme (SGP) for 2008-2010, stressing that the impact of the international developments would be significant on inflation, limited on growth, insignificant on the budget. Economic activity will slow to 3.6% in 2008 and 2009 (euro area: 1.4% and 1.2%, respectively), mainly as a result of the slowdown in the world economy, before rising to 3.8% in 2010, implying only a limited impact of the international financial turmoil on the Greek real economy. The implemented reforms in recent years, like the gradual lowering of the personal and corporate tax rates, the boost of investment through the new investment law, the Public Private Partnerships and the faster absorption of EU funds have strengthened the growth dynamics and resilience of the Greek economy. Consumption is expected to continue on a healthy

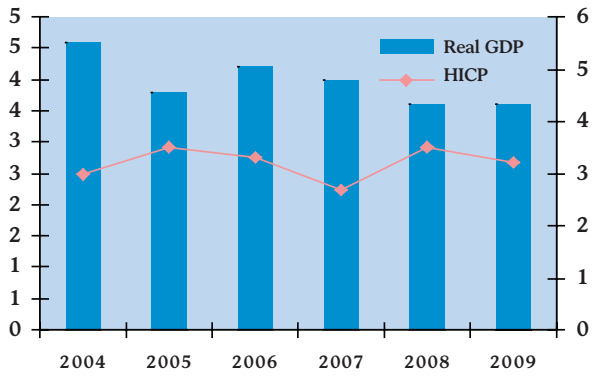
Greece: International Trade



Source: Bank of Greece

growth path and investment, especially in construction excluding housing, will remain a primary growth driver during the period 2008-2010.
In the external sector, robust export growth is set to continue in 2008, due mainly to the increasingly international profile of domestic businesses, which are expanding in size and production capacity. The sustained foreign demand, the promotional campaign of Greek products abroad by the government and the rapid development of public infrastructure in Greece and the Balkan countries will also provide a powerful boost to Greek exports. However, the continuing high growth of domestic demand, coupled with the on going gradual erosion of Greece's international competitiveness, are limiting the beneficial effect from the strong growth of exports, leading rather to a higher trade deficit. Recent BoG data indicate that in January-February 2008, the current account deficit narrowed by €1.090 billion over the same period of 2007 and reached €4.839 billion. This development reflected mainly the significant increase in the surplus of the current transfers balance and in the surplus of the services balance, which more than offset a rise in the trade deficit and a small increase in the income account deficit. In particular, the €902 million hike in the overall trade deficit was mainly a result of increases of €748 million in the trade deficit excluding oil and ships and €283 million in the net oil import bill. In the same period, direct investment showed a net outflow of €195 million, while portfolio investment recorded a net inflow of €11.3 billion, mainly in Greek government bonds and Treasury bills. Overall, Bank of Greece estimates the current account deficit to further widen in 2008 reaching roughly 15.0% of GDP from 14.1% of GDP in 2007.
Turning to price developments, the continuing rally of international commodity prices, particularly of oil, basic metals and food prices, has resulted in

Greece: Real GDP growth and inflation (annual percentage change)



Sources: European Commission and national sources

very serious inflationary pressures and "imported inflation" not only in Greece, but also in Europe and other economies worldwide [Please see Footnote 1 at the end of this section]. Inflation in Greece reached 4.4% in March 2008 (in euro area: 3.6%) and is now expected to reach 3.5% on average in 2008, up from 2.9% in 2007, but slow down during 2009 to 3.2%. The impact of imported inflation cannot be dealt with entirely, as the underlying factors arise abroad [Please see Footnote 2 at the end of this section], however it is important not to become more permanent in nature, thus closer international cooperation is needed to identify the driving forces behind developments in oil and food prices and pursue policies which remove possible supply limitations. At a national level, keeping wage increases moderate and controlling for speculative behaviour of market agents should help to contain inflation.

In line with solid economic activity, unemployment further decreased to 8.0% in 2007, the lowest rate since 1998 and is forecasted to maintain its downward trend in 2008, falling to 7.5%, less than previously expected due to slower economic growth and higher labour costs. Wages per head are set to keep rising above productivity growth, pushing unit labour costs clearly above those of the euro area and other main trading partners and having a dampening effect on the country's international competitiveness. Reducing the labour-market rigidities and enhancing productivity growth through technology and innovation are essential for maintaining strong economic growth.

The 2007 budget deficit, according to recently released data by Eurostat, increased to 2.8% of GDP from 2.6% of GDP in 2006, due to the budgetary impact of the forest fires and other one-off expenditures related to the elections, the settlement of government debt to Olympic Airlines and the one-off payment of arrears associated to the GDP revision. The economic environment remains favorable for the implementation of key fiscal objectives, like the gradual reduction of fiscal deficit to reach fiscal balance by 2010. The most difficult undertaking concerning the 2008 budget is the target to almost double net current revenues, while cutting personal and corporate tax rates. This can be achieved through the improvement of tax revenue collection system by effectively tackling tax and social contribution evasion. Some first steps were taken in the fields of heating oil and property taxation. On the expenditure side, equally important is the containment of the growth of current primary expenditure, in an environment of higher public sector employment, rising wages and pensions, and increased payments to finance the operational deficit of social security funds.

Looking at the most recent conjectur-

al indicators, the turnover in retail trade significantly slowed down to 5.9% y-o-y at current prices in January 2008 from 10.4% y-o-y in January 2007, while the volume of retail trade (i.e. turnover in retail trade at constant prices) increased only by 3.4% in the respective period compared to 6.0% in January 2007. Manufacturing production fell by 1.5% y-o-y in January-February 2008, following the 4.3% growth in the respective period in 2007. This development is due to marked decrease in the production of coal, basic metals and non-metallic minerals. Business confidence has shown signs of deterioration as indicated by the PMI index, which fell from 55.3 in October 2007 to 51.4 in January 2008, remaining though above the neutral 50 mark. The volume of residential construction activity (as measured by building permits) registered a significant decrease of 13.5% y-o-y in January 2008, reflecting the continuation of the falling trend in the housing market.

Total credit expansion continued to grow at double-digit rates in Q4 2007 (14.4%), albeit at a slightly decelerating pace, implying the limited impact on the Greek credit market of the international financial turbulence. In January 2008 total credit accelerated to 16.3% (January 2007: 12.9%), despite the increase in borrowing rates in an environment of international financial turmoil. The credit supplied to the general government, fell to -7.3% in January 2008 from -8.1% in January 2007. Meanwhile, credit growth to enterprises and households slightly accelerated in January 2008 to 22.3% from 19.9% a year earlier, still remaining strong [Please see Footnote 3 at the end of this section]. Housing loans growth cooled down to 21.8% y-o-y from 25.1% y-o-y in January 2007.

Footnotes:

1. *The share of food prices in the Harmonized Consumer Price Index was 21.7% for Greece and 15.6% for euro area in 2007, while the respective share for USA was 10% and for China 30%.*
2. *The oil price hikes are attributed to rising global demand for crude oil and its derivative products, tightness in supply, speculative activity by investors and depreciating dollar. The rise in food prices can be explained mainly by increased demand of agricultural commodities for dietary purposes, livestock and the production of biofuels and by the decrease in supply due to bad weather conditions.*
3. *These figures include loans, holdings of corporate bonds, securitized loans, as well as loan write-offs.*

Macroeconomic projections
Comparison between Greece and other main economies

	2006	2007	2008
Real GDP growth (annual % change)			
Advanced economies	3.0	2.7	1.3
Eurozone	2.8	2.6	1.4
USA	2.9	2.2	0.5
Japan	2.4	2.1	1.4
Greece	4.2	4.0	3.5
Inflation (annual % change)			
Advanced economies	2.4	2.2	2.6
Eurozone	2.2	2.1	2.8
USA	3.2	2.9	3.0
Japan	0.3	0.0	0.6
Greece	3.3	3.0	3.5
Unemployment (as % of labour force)			
Advanced economies	5.7	5.3	5.6
Eurozone	8.2	7.4	7.3
USA	4.6	4.6	5.4
Japan	4.1	4.0	3.9
Greece	8.9	8.0	7.5
Current account balance (as % of GDP)			
Advanced economies	-1.5	-1.2	-1.1
Eurozone	-0.1	-0.2	-0.7
USA	-6.1	-5.3	-4.3
Japan	3.9	4.8	4.0
Greece	-11.1	-14.0	-15.2
General government balance (as % of GDP)			
Advanced economies	-1.6	-1.2	-2.2
Eurozone	-1.4	-0.6	-1.1
USA	-2.6	-2.5	-4.5
Japan	-3.8	-3.4	-3.4
Greece	-2.6	-2.8	-1.6

Sources : IMF, European Commission and national sources.

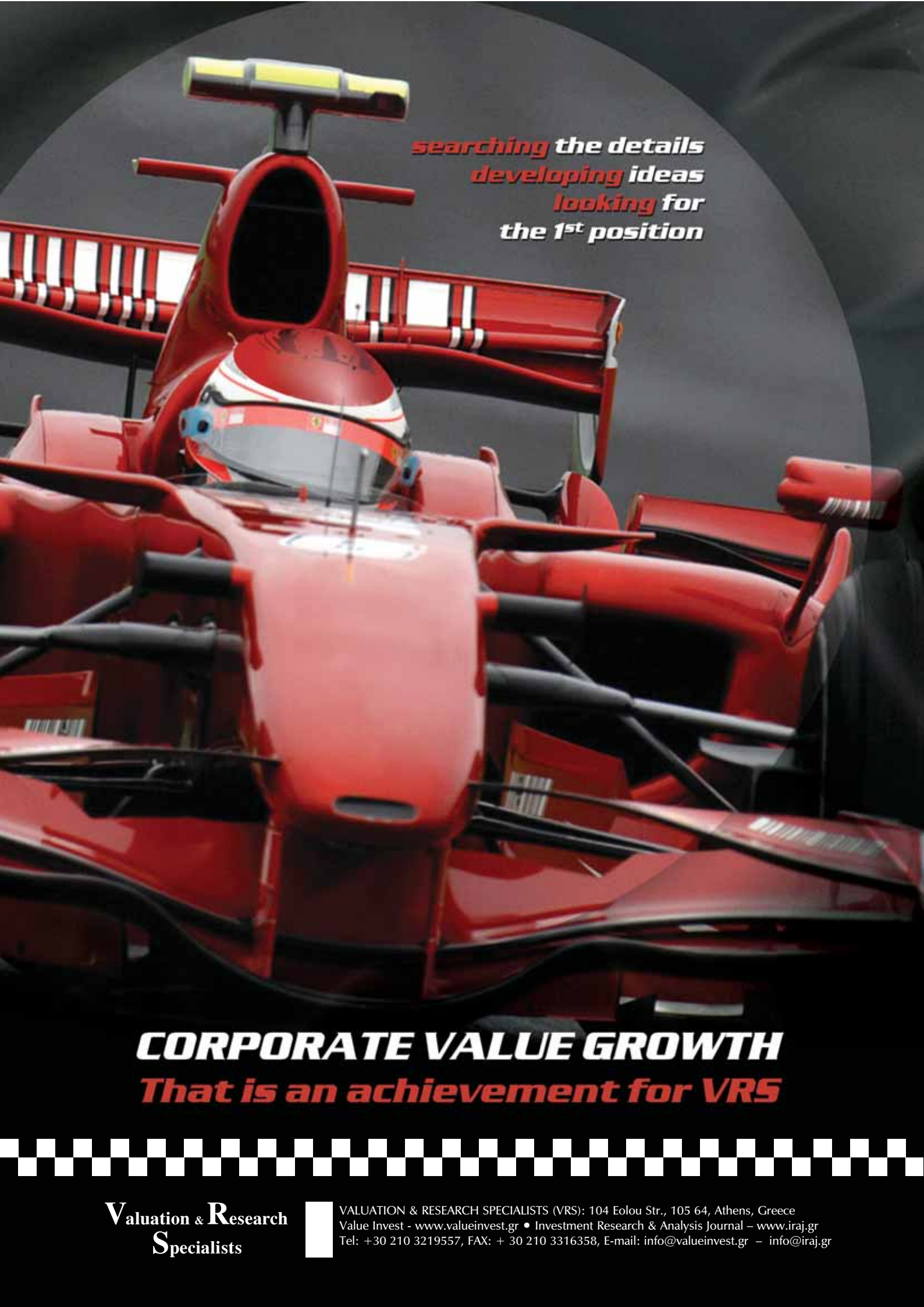
Note on Southeastern Europe (Bulgaria, Romania, Albania, FYROM, Serbia, Montenegro) and Mediterranean countries (Turkey, Egypt)

Bulgaria:

Real GDP growth remained almost unchanged to 6.2% in 2007 from 6.3% in 2006, mainly driven by strong investment growth, which was supported by large FDI inflows, surging corporate credit activity (69% y-o-y in December 2007 against 20% a year earlier) and still very low labor costs (roughly 9 times lower than in Greece). In 2008, economic activity is projected to fall to 5.5%. Private consumption will remain though relatively strong, backed by higher wage growth and still rapid credit expansion, while investment will be boosted by the EU structural funds and the further expansion of the production capacity. Net exports' negative contribution to GDP growth is set to decline, as exports gain market share, but the appreciation of lev erodes competitiveness. The current account deficit widened to 21.4% of GDP in 2007 from 15.6% in 2006, mainly because of accelerating investment-related imports and rising energy and food prices and is projected to reach 21.8% of GDP in 2008. Headline inflation soared to 13.2% y-o-y in February 2008 compared to 4.5% a year earlier, standing at a 10-year high and is forecasted to surge to 9.7% for the year as a whole. The 2008 budget is expected to be in surplus (3.0% of GDP), as a result of the still quite tight fiscal stance. The ECB has delayed Bulgaria's entry into the ERM-II (now scheduled for 2009), pending further real convergence- Bulgaria's PPP GDP per capita amounts to only one third of the EU-27 average-, lower inflation and reduced current account deficit. The EC's interim report in February urged the Bulgarian authorities to strengthen their efforts towards judicial reform and the fight against corruption and organized crime.

Romania:

The economy slowed down to 6.0% in 2007 from 7.9% in 2006 and is forecasted to further decelerate to 5.4% in 2008. Economic growth was mainly fuelled by fixed investment, which grew by an impressive 29% y-o-y in 2007, and a real estate boom. Looking ahead, domestic demand will remain strong, backed by robust investment activity, as well as robust private consumption, as the farmers' income rebounds from the 2007 drought. Exports growth should recover in 2008, assisted by the recent sharp depreciation of the lev, but the rapid import growth, backed by strong domestic demand, will widen further the current account deficit to 14.5% of GDP. The declining FDI cover ratio raises concerns and underlines the necessity to strengthen investors' confidence and attract more Greenfield



investment. The substantial intercompany transfers in 2007 made up for some of the FDI decline. Inflation stood at 4.8% in 2007 and 8.0% y-o-y in February 2008, well above the target range of 2.8-4.8% of the central bank, prompting a swift tightening of monetary policy. The persistently high food and energy prices, as well as the hikes in administered prices were the underlying causes. Foreign currency denominated borrowing, which represented half of the total loans to the private sector in December 2007, is set to continue rapidly growing in 2008. The current political uncertainty is likely to lead to further delays in the implementation of EU-related structural reforms and the fight against corruption. Parliamentary elections are scheduled for November 2008, thus an expansionary fiscal and income policy is expected, intensifying inflationary pressures.

Albania:

Albania's economic activity rebounded to 6.0% in 2007, after having decelerated to 5.0% in 2006, despite severe disruptions in the energy supply, and is estimated to remain roughly unchanged in 2008. Investment and private consumption are set to benefit from the improving business climate and lower tax rates. Fiscal legislation, electricity shortages and the informal sector appear to be the largest obstacles to business operations. Risks to inflation lie to the upside, as energy and food prices remain elevated. Inflation is expected to double in 2008 to 4.2%, above the central bank's 2%-4% target range. The 2008 budget envisages significant further fiscal policy loosening, mainly due to the rise of public investment in infrastructure, which might result in further widening of the current account deficit which rose to 8.3% of GDP last year, despite the impressive export performance (36% growth y-o-y). A number of important privatizations are in the pipeline, thus FDI inflows are likely to increase further. The remittances from expatriates, the country's main source of currency, remain strong but show a decelerating trend. The IMF urged the Albanian government to accelerate structural reforms, promote private sector involvement in key sectors of the economy, strengthen domestic capital markets and commit to fiscal discipline. The current government aims at EU and NATO membership.

FYROM:

Economic activity accelerated to 5.0% in 2007 from 3.7% in 2006 and is forecasted to 4.5% in 2008. Investment and consumption will benefit from the significant reduction in the flat personal income and corporate tax rate effective from beginning of 2008 and further progress in structural reforms. Real wages and employment are expected to remain buoyant. Inflation surged to 9.6% in February 2008, due to the sharp rise in food and oil prices (2007: 2.2%). In contrast to most of the other countries in the region,

FYROM does not have a significant external imbalance. The current account deficit was only 2.7% of GDP in 2007, but is projected to widen to 6.8% of GDP in 2008. Exports' performance was impressive and backed by strong global basic metals demand and prices (iron and steel account for over a quarter of the country's total exports). The accumulation of foreign exchange reserves, the country's net creditor external position and the increased workers remittances and net FDI provide a strong buffer against domestic and external economic shocks. FYROM did not join the NATO in April's Bucharest Summit, as a mutually acceptable decision over the "name dispute" with Greece has not been found. Early parliamentary elections are scheduled for June 2008.

Serbia:

Real GDP accelerated to 7.3% in 2007 from 5.7% in 2006, backed by strong domestic demand. Economic activity is expected to slow down significantly to 4.0% in 2008, affected by moderation in private consumption and construction activity, the latter due to higher real interest rates and rising labor costs. Inflation ballooned to 11.3% y-o-y in February 2008 as a result of high energy and food prices, as well as rapid wage growth. Monetary policy is expected to further tighten in an attempt to dampen the strong credit expansion to households and contain domestic demand, current account deficit and inflation. Fiscal policy also needs to move towards a more restrictive stance and the expenditure mix needs to be reviewed. The widening of the current account deficit (16.5% of GDP in 2007 from 12.5% of GDP in 2006) remains the main problem of Serbia, despite the improving performance of exports. Private transfers and FDI flows have significantly declined in 2007, making the financing of the deficit harder. Unemployment remains at around 30% and investment-to-GDP ratio is the lowest in the region, standing at around 20%. Political uncertainties, including the Kosovo issue, seem to define the economic landscape and derail economic reform. The Stabilization and Association Agreement (SAA) between Serbia and the EU initiated in November 2007 has not been signed yet, as Serbia needs to fully cooperate with The Hague Criminal Tribunal. The signing of the SAA will permit the disbursement of EU financial aid to Serbia under the Instrument of Pre-Accession Assistance, amounting to €1 billion over the period 2008-2011.

Montenegro:

In 2007, the economy has grown at 7.5%, supported by record-high tourism and the rise in disposable income of households, boosted by the rapid credit expansion. In 2008, real GDP growth is projected to 7.2%. Lending activity has moderated at the beginning of 2008 as a consequence of administrative measures adopted by

the central bank to dampen the soaring credit growth. Unemployment rate slightly fell to 11.8% in March 2008. In 2007, the trade deficit surged to 67% of GDP. Exports of goods decreased, reflecting the deterioration of competitiveness of local products and the sharp decline of the price of aluminium which represents half of total exports. Imports continued expanding fast by 43% in 2007, fuelled by surging investments and rising incomes. FDI inflows reached €1 billion in 2007, surging by 56% on the year. Yet, concurrent huge outflows, mostly due to real estate sales by foreigners, brought net FDI to 23% of GDP. Consumer prices further increased in February 2008 to 8% y-o-y. The budget is on surplus and the public debt quite low. The main objective of the new government, elected in February 2008, remains the establishment of an environment favouring economic development and improving the living standards of the country.

Turkey:

Economic activity has markedly decelerated in 2007 (4.6% from 6.9% a year earlier), mainly as a result of a slowdown in construction and business investment, due to higher real interest rates. The sharp drop in farmers' income, as the agricultural output was affected by the drought, has reduced private consumption. Real GDP growth is expected to further decelerate in 2008 to 3.9%, due to still weak domestic demand. The external sector will be a larger drag on the activity. Exports growth is expected to decelerate, as a result of slower foreign demand and the lagged impact of the Turkish lira appreciation. The currency appreciation and the high real interest rates in 2007 supported the disinflation effort, but inflation has recently rebounded at very high levels (9.1% in February 2008) and significantly above the central bank's target of 4%. Food and energy prices, as well as increases in indirect taxes and wages are the underlying factors explaining the high and persistent inflation. The 2008 budget targets a smaller primary surplus (4% of GDP), based on the sharp improvement in the country's debt ratios. The current account deficit remains the main source of vulnerability and is expected to widen in 2008, on the back of stronger economic growth, less competitive exports and rising international energy and food prices. Robust FDI inflows, related to the planned privatizations, will help alleviate financing concerns for at least one more year. The Erdogan government seems to be pushing through the long-awaited reform of the social security system and the rigid labor market. However, the recent move by the Chief Prosecutor to abolish the AKP party is likely to cause political uncertainty, turmoil and postponement of the reform agenda. The Cyprus issue complicates talks on EU membership.

Egypt:
Real GDP accelerated to 7.0% in 2007 from 6.8% in 2006, as a result of the on-going economic reform efforts, and is projected at 7.0% in 2008. Private investment was the main growth driver surging by 23.8% y-o-y, underlined by lower corporate taxes and strong FDI inflows increasingly channeled to the non-petroleum sector. The very strong export growth (23.3%) stemming from the solid performance of the Suez Canal, remittances, tourism and hydrocarbon exports resulted in a current account surplus of 1.4% of GDP, despite the booming imports. In line with the sustained high rate of output growth, unemployment fell to 8.8% in 2007 from 9.0% in 2006. The gradual elimination of energy subsidies is putting upward pressure on inflation, reinforcing the impact from higher food prices and strong domestic demand. In February 2008, headline inflation moved back to double-digits at 12.1% y-o-y from 6.9% y-o-y in December 2007. Further cuts in energy subsidies planned for the coming months and the anticipated introduction of VAT are expected to keep inflationary pressures high, forcing the central bank to further tighten its monetary policy, but will help the government to tackle the serious problem of very wide fiscal gaps. The key political concern regards the political succession of the current President Mubarak.

Southeastern Europe – Summary of Economic Indicators (annual % change unless otherwise stated)

Greece	2005	2006	2007	2008
Real GDP	3.8	4.2	4.0	3.6
Consumer Prices	3.5	3.3	3.0	3.5
Unemployment	9.5	8.9	8.0	7.5
Current account (% of GDP)	-7.4	-11.1	-14.0	-15.2
Fiscal Balance (% of GDP)	-5.1	-2.6	-2.8	-1.6
Public Debt (% of GDP)	98.0	95.3	94.5	91.0
FDI (net, US $ mill.)	-844.7	1197.6	-3424.9	-

Bulgaria	2005	2006	2007	2008
Real GDP	6.2	6.3	6.2	5.5
Consumer Prices	6.0	7.4	7.6	9.7
Unemployment	10.1	9.0	7.5	6.8
Current account (% of GDP)	-12.0	-15.6	-21.4	-21.8
Fiscal Balance (% of GDP)	2.0	3.2	3.0	3.1
Public Debt (% of GDP)	29.2	22.8	19.3	15.9
FDI (net, US $ mill.)	3981	5274	8086	6441

Romania	2005	2006	2007	2008
Real GDP	4.1	7.9	6.0	5.4
Consumer Prices	9.0	6.5	4.8	7.0
Unemployment	7.2	7.3	7.1	7.0
Current account (% of GDP)	-8.9	-10.4	-14.0	-14.5
Fiscal Balance (% of GDP)	-1.4	-1.9	-2.7	-3.2
Public Debt (% of GDP)	15.8	12.4	12.5	12.8
FDI (net, US $ mill.)	6469	11426	9731	10416

Albania	2005	2006	2007	2008
Real GDP	5.5	5.0	6.0	6.0
Consumer Prices	2.4	2.4	2.9	4.2
Unemployment	14.3	13.9	13.5	13.1
Current account (% of GDP)	-6.6	-5.9	-8.3	-8.3
Fiscal Balance (% of GDP)	-3.6	-3.2	-3.4	-5.0
Public Debt (% of GDP)	56.7	55.7	54.7	55.3
FDI (net, US $ mill.)	300	300	600	600

Southeastern Europe – Summary of Economic Indicators
(annual % change unless otherwise stated)

FYROM	2005	2006	2007	2008
Real GDP	4.1	3.7	5.0	4.5
Consumer Prices	0.5	3.2	2.2	7.0
Unemployment	37.3	36.0	34.9	33.2
Current account (% of GDP)	-1.3	-0.4	-2.7	-6.8
Fiscal Balance (% of GDP)	0.2	-0.5	0.6	-1.5
Public Debt (% of GDP)	48.5	41.5	27.0	25.0
FDI (net, US $ mill.)	124	377	274	274

Serbia	2005	2006	2007	2008
Real GDP	6.2	5.7	7.3	4.0
Consumer Prices	17.3	12.7	6.8	11.3
Unemployment	21.8	21.6	18.8	17.9
Current account (% of GDP)	-8.5	-12.5	-16.5	-16.1
Fiscal Balance (% of GDP)	1.9	1.6	0.4	0.7
Public Debt (% of GDP)	52.9	38.8	28.7	31.3
FDI (net, US $ mill.)	1600	4300	2200	2600

Turkey	2005	2006	2007	2008
Real GDP	8.4	6.9	4.6	3.9
Consumer Prices	8.2	9.5	8.7	7.5
Unemployment	10.2	9.9	9.9	9.5
Current account (% of GDP)	-4.7	-6.1	-5.7	-6.7
Fiscal Balance (% of GDP)	-0.6	-0.1	-1.2	-0.9
Public Debt (% of GDP)	52.3	46.1	38.8	37.1
FDI (net, US $ mill.)	8900	19000	19800	22300

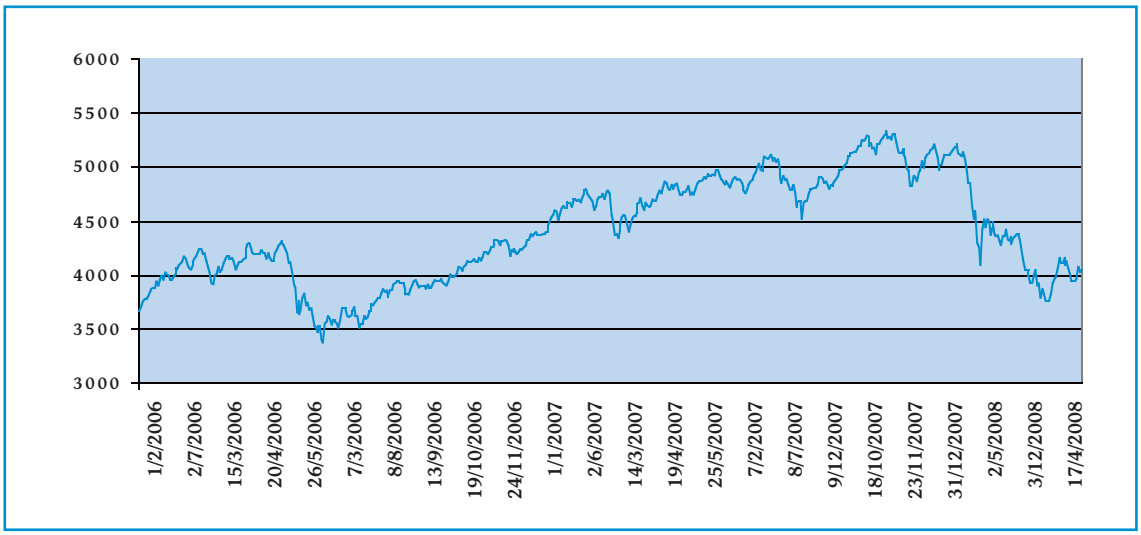
Egypt	2005	2006	2007	2008
Real GDP	4.5	6.8	7.0	7.0
Consumer Prices	8.8	4.2	11.0	8.8
Unemployment	10.9	9.0	8.8	8.6
Current account (% of GDP)	3.2	0.8	1.4	0.8
Fiscal Balance (% of GDP)	-9.2	-7.7	-6.7	-6.2
Public Debt (% of GDP)	93.7	82.8	73.7	64.7
FDI (net, US $ mill.)	6100	11100	12700	11000

Sources: European Commission, IMF, EBRD, National Bank of Greece, Dynamic Securities.

The Greek Equity Market (up to 22 April 2008)

The uncertainty surrounding international capital markets continued in the first four months of 2008. Athens Exchange, although the companies listed in it, especially banks, had no exposure in complex structured financial instruments related to the credit crisis, was severely affected by a mixture of psychological and economical reasons. In addition to negative momentum due to increased correlation with foreign markets, Athens Exchange was also affected by concerns related to potential growth of Greek companies and banks in Balkans as the sub-prime turbulence is not clear yet to what extend will affect real economies. Thus, although corporate profitability remained relatively robust in most sectors, the Composite Index reported a negative performance of 21.7% y-t-d. Similar figures observed for the FTSE-20 and FTSE-40 indices, and only the small cap index (FTSE-80) reported relatively smaller drop. Regarding sectoral indices, the only positive figure was reported by the media sector. Out of large cap stocks, only Postal Savings Bank reported a positive figure, as two large Greek banks entered into its share-capital. Also the defensive nature of companies such as Coca-Cola, Intralot, OPAP resulted to relatively small price reduction for these type of companies especially in relation to banking shares. Similar picture was observed for the mid-cap index, with only two companies reporting positive price change, while in the small-cap index one tenth of the companies reported a positive sign.

Athens Exchange Composite Index
(Daily prices 1/1/2006 – 22/4/2008)



Greek Equities - Statistics

NAME	Price 31/12/2007	52W High	52W Low	Price 22/04/2008	%52W High	% 52W Low	%YTD
FTSE/ASE SMALL CAP 80 IX	1,057.38	1,236.85	851.11	913.91	-26.1%	7.4%	-13.6%
FTSE/ASE MIDCAP 40 INDEX	6,264.66	6,934.05	4,592.81	4,955.77	-28.5%	7.9%	-20.9%
ASE GENERAL INDEX	5,178.83	5,346.04	3,735.47	4,055.59	-24.1%	8.6%	-21.7%
FTSE/ASE 20 INDEX	2,752.48	2,856.78	1,924.84	2,113.19	-26.0%	9.8%	-23.2%
FTSE/ATHEX MEDIA	5,505.62	6,934.80	4,262.58	5,701.08	-17.8%	33.7%	3.6%
FTSE/ATHEX FOOD & BEV	10,109.20	10,956.87	7,035.02	9,674.31	-11.7%	37.5%	-4.3%
FTSE/ATHEX RETAIL	7,990.73	8,385.73	6,040.31	7,212.41	-14.0%	19.4%	-9.7%
FTSE/ATHEX TRAVEL & LEIS	5,591.38	5,897.06	3,986.21	4,972.84	-15.7%	24.8%	-11.1%
FTSE/ATHEX OIL & GAS IDX	4,476.18	5,148.39	3,428.75	3,873.18	-24.8%	13.0%	-13.5%
FTSE/ATHEX CHEMICALS	12,890.36	14,962.04	8,968.46	11,027.75	-26.3%	23.0%	-14.4%
FTSE/ATHEX HEALTH CARE	16,861.74	18,169.62	12,413.00	14,279.35	-21.4%	15.0%	-15.3%
FTSE/ATHEX CONST & MATER	6,015.79	7,863.59	4,661.40	5,029.42	-36.0%	7.9%	-16.4%
FTSE/ATHEX FINC SERVICES	10,544.95	12,184.81	6,902.88	8,608.95	-29.3%	24.7%	-18.4%
FTSE/ATHEX IND GOODS SRV	7,982.01	9,074.95	5,440.35	6,332.00	-30.2%	16.4%	-20.7%
FTSE/ATHEX UTILITIES	9,418.33	9,708.25	5,028.72	7,294.25	-24.9%	45.1%	-22.6%
FTSE/ATHEX INSURANCE IDX	5,959.38	6,373.09	4,208.65	4,571.91	-28.3%	8.6%	-23.3%
FTSE/ATHEX PER HOUS GOOD	8,018.95	8,583.70	5,450.36	6,041.77	-29.6%	10.9%	-24.7%
FTSE/ATHEX TELECOM INDEX	6,937.00	7,207.04	4,811.49	5,191.35	-28.0%	7.9%	-25.2%
FTSE/ATHEX BANKS INDEX	7,296.42	7,801.06	4,869.51	5,350.84	-31.4%	9.9%	-26.7%
FTSE/ATHEX BASIC RESOURC	7,713.75	10,110.17	4,704.04	5,580.54	-44.8%	18.6%	-27.7%
FTSE/ATHEX TECHNOLOGY	4,037.19	5,139.29	2,459.45	2,692.45	-47.6%	9.5%	-33.3%

FTSE-20 MEMBERS	Price 31/12/2007	52W High	52W Low	Price 22/04/2008	%52W High	% 52W Low	%YTD
GREEK POSTAL SAVINGS BANK	12.38	18.94	8.72	12.90	-31.9%	47.9%	4.2%
COCA-COLA HELLENIC BOTTLING	29.60	32.48	20.89	29.00	-10.7%	38.8%	-2.0%
MOTOR OIL (HELLAS) SA	15.80	22.20	12.30	14.80	-33.3%	20.3%	-6.3%
INTRALOT S.A.-INTEGRATED LOT	13.54	15.14	9.42	12.16	-19.7%	29.1%	-10.2%
MARFIN INVESTMENT GROUP SA	5.94	18.14	3.70	5.26	-71.0%	42.2%	-11.4%
OPAP SA	27.42	29.14	18.12	24.22	-16.9%	33.7%	-11.7%
TITAN CEMENT CO. S.A.	31.20	44.80	25.20	27.42	-38.8%	8.8%	-12.1%
ALPHA BANK A.E.	24.90	26.16	18.40	20.78	-20.6%	12.9%	-16.5%
HELLENIC PETROLEUM SA	11.28	12.44	8.34	9.38	-24.6%	12.5%	-16.8%
EFG EUROBANK ERGASIAS	24.08	27.59	16.96	19.12	-30.7%	12.7%	-20.6%
HELLENIC TECHNODOMIKI TEV SA	9.80	10.80	7.32	7.70	-28.7%	5.2%	-21.4%
PUBLIC POWER CORP	36.00	37.40	18.12	27.40	-26.7%	51.2%	-23.9%
PIRAEUS BANK S.A.	26.70	28.60	16.30	20.30	-29.0%	24.5%	-24.0%
HELLENIC TELECOMMUN ORGANIZA	25.20	26.98	17.46	18.86	-30.1%	8.0%	-25.2%
VIOHALCO	9.94	13.80	6.00	7.40	-46.4%	23.3%	-25.6%
AGRICULTURAL BANK OF GREECE	3.82	4.22	2.64	2.71	-35.8%	2.7%	-29.1%
NATIONAL BANK OF GREECE	46.98	48.00	31.02	32.70	-31.9%	5.4%	-30.4%
BANK OF CYPRUS LTD	12.50	13.96	7.20	8.26	-40.8%	14.7%	-33.9%
MYTILINEOS HOLDINGS S.A.	14.36	18.22	7.12	8.52	-53.2%	19.7%	-40.7%
MARFIN POPULAR BANK PUBLIC C	9.10	11.40	4.76	5.26	-53.9%	10.5%	-42.2%

FTSE-40 MEMBERS	Price 31/12/2007	52W High	52W Low	Price 22/04/2008	%52W High	% 52W Low	%YTD
LAMBRAKIS PRESS SA	2.48	4.00	1.87	3.58	-10.5%	91.4%	44.4%
SIDENOR STEEL PRODUCTS MANU	10.16	17.72	7.22	10.48	-40.9%	45.2%	3.1%
BABIS VOVOS INTL CONSTRUCT	20.36	28.38	17.80	19.50	-31.3%	9.6%	-4.2%
ANEK LINES SA	2.29	2.85	1.51	2.15	-24.6%	42.4%	-6.1%
ALAPIS HOLDING INDUSTRIAL	2.33	2.58	1.20	2.13	-17.4%	78.1%	-8.6%
DIAGNOSTIC & THERAPEUTIC	4.14	5.78	3.32	3.76	-34.9%	13.3%	-9.2%
ATHENS WATER SUPPLY & SEWAGE	11.82	13.20	6.94	10.72	-18.8%	54.5%	-9.3%
MICHANIKI SA	5.50	9.30	3.44	4.88	-47.5%	41.9%	-11.3%
NEOCHIMIKI LV LAVRENTIADIS	20.40	23.52	13.56	18.10	-23.0%	33.5%	-11.3%
EUROBANK PROPERTIES REAL EST	9.10	14.58	7.82	8.04	-44.9%	2.8%	-11.6%
MINOAN LINES SHIPPING SA	4.86	6.60	4.02	4.26	-35.5%	6.0%	-12.3%
FRIGOGLASS SA	24.80	26.48	17.60	21.66	-18.2%	23.1%	-12.7%
S & B INDUSTRIAL MINERALS SA	12.03	13.89	8.54	10.20	-26.6%	19.4%	-15.2%
ASTIR PALACE HOTELS SA	6.64	8.54	4.96	5.52	-35.4%	11.3%	-16.9%
METKA SA	15.42	19.24	10.82	12.70	-34.0%	17.4%	-17.6%
SARANTIS SA	14.00	15.00	8.04	11.40	-24.0%	41.8%	-18.6%
GENIKI BANK SA	5.20	6.81	3.74	4.20	-38.3%	12.3%	-19.2%
BLUE STAR MARITIME SA	3.80	4.28	2.68	3.04	-29.0%	13.4%	-20.0%
IASO S.A.	12.54	14.17	8.04	10.00	-29.4%	24.4%	-20.3%
GEK GROUP OF COS SA	10.50	14.60	6.50	8.26	-43.4%	27.1%	-21.3%
AEGEAN AIRLINES	6.80	10.70	4.66	5.30	-50.5%	13.7%	-22.1%
FOLLI-FOLLIE SA-REG	25.50	34.90	16.60	19.74	-43.4%	18.9%	-22.6%
HALCOR S.A.	3.14	6.12	2.02	2.34	-61.8%	15.8%	-25.5%
JUMBO SA	24.80	27.90	15.48	18.48	-33.8%	19.4%	-25.5%
J&P-AVAX SA	6.44	8.50	4.68	4.78	-43.8%	2.1%	-25.8%
FOURLIS SA	27.10	28.18	16.68	20.06	-28.8%	20.3%	-26.0%
INFO-QUEST SA	3.00	4.84	2.12	2.21	-54.3%	4.2%	-26.3%
C. ROKAS S.A.	18.96	24.60	10.08	13.74	-44.1%	36.3%	-27.5%
PROTON BANK SA	9.80	11.12	6.84	7.00	-37.1%	2.3%	-28.6%
ELVAL ALUMINUM PROCESS CO.	3.18	4.98	2.10	2.25	-54.8%	7.1%	-29.2%
LAMDA DEVELOPMENT SA	14.32	17.56	9.04	10.02	-42.9%	10.8%	-30.0%
ATHENS MEDICAL CENTER	4.58	6.20	2.86	3.14	-49.4%	9.8%	-31.4%
CORINTH PIPEWORKS SA	5.96	7.66	3.24	3.82	-50.1%	17.9%	-35.9%
SPRIDER STORES SA	5.20	5.88	2.56	3.32	-43.5%	29.7%	-36.2%
INTRACOM HOLDINGS SA-REG	3.62	4.94	1.98	2.28	-53.8%	15.2%	-37.0%
FORTHNET SA	10.04	11.62	4.82	6.24	-46.3%	29.5%	-37.8%
TERNA SA	12.38	16.00	6.10	7.68	-52.0%	25.9%	-38.0%
EUROMEDICA SA	11.78	12.38	7.10	7.30	-41.0%	2.8%	-38.0%
HELLENIC EXCHANGES SA HOLDIN	24.00	24.38	13.38	14.50	-40.5%	8.4%	-39.6%
M.J. MAILLIS S.A.	1.76	3.24	0.62	0.76	-76.5%	22.6%	-56.8%

FTSE 80 MEMBERS	Price 31/12/2007	52W High	52W Low	Price 22/04/2008	%52W High	% 52W Low	%YTD
NEXANS HELLAS S A	3.98	10.06	3.34	5.18	-48.5%	55.1%	30.2%
ALFA-BETA VASSILOPOULOS S.A.	37.98	48.50	16.90	46.72	-3.7%	176.4%	23.0%
EVEREST SA	2.98	3.46	2.05	3.44	-0.6%	67.8%	15.4%
CRETA FARMS A.	7.86	9.34	3.51	8.72	-6.6%	148.4%	10.9%
X.K. TEGOPOULOS PUBLISHING	1.84	2.33	1.28	1.97	-15.5%	53.9%	7.1%
NEWSPHONE HELLAS SA	1.01	1.90	0.78	1.06	-44.2%	35.9%	5.0%
X. BENRUBI S.A.	4.06	5.20	3.10	4.20	-19.2%	35.5%	3.4%
FLEXOPACK S.A.	8.00	8.68	7.00	8.20	-5.5%	17.1%	2.5%
PEGASUS PUBLISHING S.A.	2.64	3.74	1.84	2.60	-30.5%	41.3%	-1.5%
ALPHA ASTIKA AKINITA S.A.	7.90	8.50	7.00	7.76	-8.7%	10.9%	-1.8%
ATTICA PUBLICATIONS S.A.	4.40	6.08	2.51	4.18	-31.3%	66.5%	-5.0%
HELLENIC DUTY FREE SHOPS SA	12.06	16.00	9.62	11.42	-28.6%	18.7%	-5.3%
EMPORIKI BANK OF GREECE SA	20.32	22.44	18.64	19.22	-14.3%	3.1%	-5.4%
BALKAN EXPORT S A	3.20	5.22	2.03	3.02	-42.1%	48.8%	-5.6%
ELEFTHERI TILEORASI SA	6.44	10.10	4.00	6.04	-40.2%	51.0%	-6.2%
ELTRAK S.A.	5.70	8.62	3.78	5.32	-38.3%	40.7%	-6.7%
BANK OF ATTICA	4.02	4.62	2.76	3.74	-19.0%	35.5%	-7.0%
AGROTIKI INSURANCE S A	3.56	4.76	2.45	3.30	-30.7%	34.7%	-7.3%
DAIOS PLASTICS SA	11.18	13.98	8.62	10.30	-26.3%	19.5%	-7.9%
KARATZIS A (HELLASNET)	2.10	3.22	1.62	1.90	-41.0%	17.3%	-9.5%
KORRES NATURAL PRODUCTS	14.22	16.26	10.24	12.66	-22.1%	23.6%	-11.0%
HELLENIC SUGAR INDUSTRY (CB)	4.48	7.30	3.38	3.94	-46.0%	16.6%	-12.1%
EURODRIP S A	0.98	1.52	0.69	0.85	-44.1%	23.2%	-13.3%
AS COMPANY S A	2.04	2.59	1.18	1.76	-32.0%	49.2%	-13.7%
UNIBRAIN S A	3.90	4.74	1.69	3.34	-29.5%	97.3%	-14.4%
ELTON CHEMICALS-REG	1.05	1.76	0.73	0.89	-49.4%	21.9%	-15.2%
BIOKARPET SA	2.84	3.74	1.85	2.40	-35.8%	29.7%	-15.5%
BITROS S.A.	2.84	4.84	2.09	2.39	-50.6%	14.4%	-15.8%
PETROPOULOS	7.70	9.76	5.16	6.44	-34.0%	24.8%	-16.4%
ALCO HELLAS S.A.	1.16	1.82	0.89	0.97	-46.6%	9.0%	-16.4%
MULTIRAMA SA-REGISTERED SHS	7.28	N/A	N/A	6.06	N/A	N/A	-16.8%
EUROPEAN RELIANCE GEN INSURA	3.10	3.80	2.18	2.48	-34.7%	13.8%	-20.0%
SIDMA SA	5.38	8.86	3.60	4.30	-51.5%	19.4%	-20.1%
LOULIS MILLS S.A.	3.64	4.06	2.61	2.89	-28.8%	10.7%	-20.6%
ELINOIL HELLENIC PETROLEUM	10.36	10.84	7.40	8.22	-24.2%	11.1%	-20.7%
KEGO S A	2.55	4.10	1.67	2.00	-51.2%	19.8%	-21.6%
EL. D. MOUZAKIS S.A.	2.35	2.78	1.53	1.84	-33.8%	20.3%	-21.7%
YALCO S.A.	2.72	2.94	1.36	2.10	-28.6%	54.4%	-22.8%
EDRASIS C.-PSALLIDAS TECHNIC	1.27	1.69	0.85	0.97	-42.6%	14.1%	-23.6%
PIRAEUS PORT AUTHORITY	30.08	33.70	16.76	22.90	-32.0%	36.6%	-23.9%
DIAS AQUACULTURE S A-REG	4.68	4.92	2.40	3.56	-27.6%	48.3%	-23.9%
ALLATINI IND. & COM CO.	2.20	4.30	1.46	1.65	-61.6%	13.0%	-25.0%
A. KALPINIS-N. SIMOS STEEL	2.30	3.92	1.20	1.72	-56.1%	43.3%	-25.2%
SANYO HELLAS HOLDINGS S.A.	0.98	1.59	0.69	0.72	-54.7%	4.3%	-26.5%
VARDAS SA	3.12	3.40	2.20	2.28	-32.9%	3.6%	-26.9%
INFORM P. LYKOS S.A.	4.32	5.52	3.00	3.12	-43.5%	4.0%	-27.8%
MOTODYNAMIC SA	6.40	8.00	3.98	4.62	-42.3%	16.1%	-27.8%
NEORION NEW SA HOLDINGS	1.65	2.78	0.90	1.18	-57.6%	31.1%	-28.5%
ALPHA GRISIN INFOTECH SA	3.90	5.50	1.68	2.78	-49.5%	65.5%	-28.7%
CYCLON HELLAS SA	1.56	2.49	0.91	1.11	-55.4%	22.0%	-28.8%
AUDIO VISUAL ENTERPRISES S A	4.46	6.10	2.93	3.16	-48.2%	7.8%	-29.1%
THRACE PLASTICS CO SA	1.62	2.60	1.01	1.14	-56.2%	12.9%	-29.6%
BYTE COMPUTER S.A.	3.00	4.60	1.91	2.10	-54.3%	9.9%	-30.0%
INTERTECH S.A. INTER. TECHNO	2.73	4.60	1.62	1.90	-58.7%	17.3%	-30.4%
KRI-KRI MILK INDUSTRY S A	2.86	4.11	1.73	1.99	-51.6%	15.0%	-30.4%
SPYROU HOUSE OF AGRICULTURE	2.88	3.48	1.72	1.98	-43.1%	15.1%	-31.3%
HATZIOANNOU SA	1.63	2.16	0.92	1.12	-48.1%	21.7%	-31.4%
INTRACOM S.A. TECHNICAL & STE	1.24	1.62	0.77	0.85	-47.5%	10.4%	-31.5%
DROMEAS SA-REGD	1.14	2.12	0.63	0.78	-63.2%	23.8%	-31.6%
ELGEKA S A	1.79	2.78	1.12	1.22	-56.1%	8.9%	-31.8%
CENTRIC MULTIMEDIA SA	2.27	3.06	0.93	1.54	-49.7%	66.1%	-32.2%
BIOTER S.A.	1.03	1.36	0.66	0.68	-49.9%	3.0%	-34.0%
REVOIL SA	1.74	2.42	1.00	1.14	-52.9%	14.0%	-34.5%
MICROLAND COMPUTERS SA	7.14	9.10	4.00	4.60	-49.5%	15.0%	-35.6%
LIGHT METALS INDUSTRY	2.29	3.76	1.40	1.46	-61.2%	4.3%	-36.2%
HELLENIC FISH FARMING SA	1.29	2.08	0.70	0.78	-62.5%	11.4%	-39.5%
ASPIS PRONIA GENERAL INS SA	1.18	1.44	0.63	0.70	-51.4%	11.1%	-40.7%
PROFILE SYSTEMS & SOFTWARE S	3.10	3.52	1.65	1.83	-48.0%	10.9%	-41.0%
ELVE S.A.	2.75	3.90	1.42	1.62	-58.5%	14.1%	-41.1%
C. CARDASSILARIS & SONS S.A.	1.97	3.46	1.01	1.16	-66.5%	14.9%	-41.1%
DRUCKFARBEN HELLAS A.E.B.E.	3.92	4.60	2.11	2.24	-51.3%	6.2%	-42.9%
SELECTED TEXTILE IND ASSOC	0.81	1.31	0.36	0.46	-64.9%	27.8%	-43.2%
SPACE HELLAS SA TELECOMMUNIC	1.53	2.00	0.82	0.86	-57.0%	4.9%	-43.8%
KOUMBAS SYNERGY GROUP S.A.	3.00	4.42	1.53	1.65	-62.7%	7.8%	-45.0%
SHELMAN	1.70	2.54	0.86	0.90	-64.6%	4.7%	-47.1%
SATO S A	2.94	4.26	1.13	1.53	-64.1%	35.4%	-48.0%
FHL MANUFACTUR-TRADING CO S A	1.71	2.64	0.78	0.88	-66.7%	12.8%	-48.5%
IMPERIO-ARGO GROUP TRANSPORT	3.98	5.20	1.69	1.93	-62.9%	14.2%	-51.5%
VELL INTERNATIONAL GROUP S.A	1.41	2.12	0.54	0.58	-72.6%	7.4%	-58.9%
LIVANI PUBLISHING ORGANIZATI	2.52	2.70	0.70	0.82	-69.6%	17.1%	-67.5%

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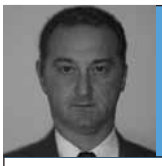

Harilaos Mertzanis

European Financial Regulation and Financial Integration: the impact of the Markets in Financial Instruments Directive (MiFID)

Abstract

MiFID will contribute to the EU financial market integration to the extent that it succeeds in smoothing-out divergent transaction costs and enhancing the level and diversification of finance through the elimination of impediments on cross-border transactions, thus reducing home bias. The latter will depend on whether European agents do actually obtain a true access into the European capital market. Moreover, MiFID is expected to widen risk transfer/sharing possibilities in the EU thus overhauling financial intermediation. To effectuate efficient risk transfer, national regulators will have to acquire adequate regulatory powers and exercise their supervisory duties in an effective and coordinated way. However, the approach MiFID takes to reform European capital markets may not contribute to the containment of systemic risk for it tends to increase the homogeneity in financial behavior, thus potentially decreasing liquidity and therefore precipitating systemic disruption. This means that in the post-MiFID era, regulators must establish efficient mechanisms against financial insolvency of investment firms.

1. INTRODUCTION

Academic research has shown that economic activity within States that belong in a monetary union is more integrated than economic activity between States. Borders still matter, despite ongoing globalization (Wei, 1996; Helliwell, 1998). This evidence raises questions for member-States that are characterized by limited internal productive specialization and financial diversification. Even though smaller member-States exhibit proportionately greater international trade of products and services than large member-States in a union, a bias towards domestic trade exists in that small States trade between them less than small regions within large States. This

difference has induced many small States to adopt policies explicitly aimed at enhancing international linkages. Initially, some States pegged the value of their currency to that of a larger State, deciding that the benefits of enhanced economic integration are sufficient to offset the loss of monetary independence. Later, States have joined customs or monetary unions. The European Union (EU) has been the most important effort to enhance economic linkage and achieve socio-economic integration among European States. Two policies have taken up largely the task of achieving economic and monetary integration: the adoption of a single European currency and the harmonization of business law. The adoption of a single currency, the Euro, by eleven European States has re-ignited interest in the economics and politics of monetary unions. The harmonization of business law saw its most vivid manifestation in financial law harmonization. The latter is consolidated by the implementation of the EU Financial Services Action Plan (FSAP). A centerpiece of the FSAP is the Directive on Markets in Financial Instruments 2004/39/EC (MiFID hereafter). MiFID constitutes an important update of the Investment Services Directive (ISD) and is one of the first Directives to follow the so-called 'fast-track Lamfalussy process' designed to cater for Directives being framed at a high level of principles allowing more detailed implementing measures and rules to be legislated in a faster procedure by the European Commission, based on advice by the Committee of European Securities Regulators (CESR), and subject to the assent of the European Securities Committee (ESC). Despite the aims of the Lamfalussy process, it is interesting to note that the preceding ISD comprised 32 Articles, compared to 73 Articles in MiFID.

The scope of MiFID is extended to include investment advice, commodity derivatives and tied agents.

The most important developments MiFID introduces over ISD include the extension of the Directive's scope in financial instruments and investment services, the enhancement of choice of activity and access rights of investment firms as well as their conduct of business obligations against their customers, the changing role of markets and their regulation and the enhancement of EU regulatory harmonization. The scope of MiFID is extended to include investment advice, commodity derivatives and tied agents. Also, operational licensing is now required not only of firms providing services to third parties, but also of other firms or investors dealing on own account, in a capacity that does not involve services to third parties.

In theory there are stronger passport rights and country of origin conduct of business standards will apply in most cases, transaction reporting is strengthened and harmonized, new

best execution standards are introduced (including mandatory disclosure of execution policies), order handling standards are also introduced and there are detailed provisions to define eligible counterparties and professional clients, so that lighter regulatory regimes can be applied to them. For firms that internalize share transactions (i.e. deal with their customers on a principal rather than agency basis) a new mandatory quoting obligation is introduced as well as new restrictions on price improvement and new rules on open access.
The concept of regulated markets that had over the past decades been introduced in most EU legislation on financial markets is strengthened and new standards for regulated markets and their operators are being introduced. For markets, the concentration rule, which permitted Member States to mandate that all execution of domestic retail orders take place on a regulated market, is removed. There are new standards for the operation of multilateral trading facilities (MTFs). MiFID aims at level-playing field regulation of a variety of execution venue types, including Regulated Markets (exchanges), multilateral trading venues (MTFs), and internalization systems. There are new provisions on both pre-trade and post-trade equity transparency and on transaction reporting. Finally, two high level provisions are introduced regarding access to clearing and settlement.
An important aspect of MiFID is that through extensive use of the Lamfalussy process, the Directive lays the groundwork for detailed harmonization of many areas of EU member-State regulation, including conduct of business rules, trade reporting, and management of conflicts of interest. This can in principle have benefits for the integration of European markets. But member-States will remain free in all areas to impose additional national rules on top of those prescribed by Community law so that, depending on the approach member-States take, important divergences might remain. Fundamentally, all this regulation is supposed to be geared to the dual task of increasing harmonization of national rules and thereby enhancing EU capital market integration as a central factor in deepening the integration of the economic and monetary union.
In what follows, section 2 introduces the central elements of economic and financial integration process and highlights the role of monetary and structural factors in explaining differences in economic integration within and between States, then proceeds with a discussion of financial market integration by distinguishing between microeconomic and macroeconomic aspects of trading in financial services and by highlighting the special importance of systemic risk. The section ends with a discussion of the implications of MiFID's implementation for financial integration. Finally section 3 offers some conclusions.

2. FINANCIAL MARKET INTEGRATION

The degree of EU economic integration has been analyzed in respect of several factors: Europe's commitment to the Maastricht Treaty, the increased academic interest in economic geography, the substantial reduction in transport and communication costs, and the availability of

new data sets (Adams et al. 1998; Krugman, 1992, 1993). Most of relevant research suggests that national borders remain considerable impediments to economic integration despite globalization. The concept of economic integration does not have a single, straightforward meaning, and two variants are usually distinguished. The first, simpler case concerns commodities, which are sold in international auction markets and for which sales transactions are largely unaffected by the identity or characteristics of the producing firm. For such commodities, markets are integrated, if consumers in different regions have access to the same goods at similar prices. A notable feature of these commodity markets is that they can be integrated without interregional trade being extensive, for a producing firm selling into one region can substitute sales into another region very rapidly if necessary. The second, more complex case concerns goods and services, including financial services, whose producing firms have limited ability to substitute sales between regions because sales are affected in addition to price by non-price factors such as the firm's product quality, marketing strategy and distribution network. In this case, economic integration requires, in addition to prices being similar, goods and services produced in one region being routinely sold and used in other regions; that is, it requires tradability and smooth cross-border transactions. Because most goods and services are not sold anonymously through auctions in international markets, the second case is most important. For this reason, it is not generally sufficient to consider that regions are integrated because they produce similar goods and services at similar prices; smooth trading on these products is also necessary.
Financial markets, like goods markets, are also more integrated within member-States than they are between States. Reasons for the different degree of integration include mainly currency and financial structures.
Even though low financial market integration can be costly for producers and consumers of financial services living in small member-States of a monetary union, economists believe that a monetary union enhances financial market integration. Full integration of financial markets implies that prices of similar assets in different regions are the same (except for different transactions costs) and agents in different regions have access to and trade financial assets from different regions as part of their decisions to save, borrow, invest, and hedge against risk. The resulting increase in the availability and diversification of finance raises the independence of investment decisions from savings decisions and the capital account position adjusts smoothly to offset desired current account imbalances.
In this respect, MiFID will contribute to EU financial market integration to the extent that its implementation succeeds in smoothing-out divergent transaction costs through increased transactions transparency and freedom of activity, and in enhancing the level and diversification of finance through the elimination of impediments on cross-border transactions.
It should be stressed that both goods market and financial market integra-

tion are necessary for full economic integration, as any member-State's desired current account position must properly adjust through the simultaneous exchange of financial assets. Consequently, if consumers of financial services in one member-State prefer to (or are inhibited from) exchange financial instruments with other consumers in that State rather than other member-States or the rest of the world, goods market flows will be impeded and economic integration will be retarded. Thus, MiFID will contribute to the enhancement of economic integration to the extent that its implementation succeeds in encouraging investors to exchange financial assets in a larger and more diversified European capital market, thus eliminating home State bias. The process of trading financial assets can be better understood by separating the analysis into microeconomic and macroeconomic aspects (Bayoumi, 1997), and this is what we turn into below.

2.1 Microeconomic issues

While today the price of identical financial assets is similar in different States, it seems that agents in different member-States of a monetary union buy and sell different assets, whilst agents in different locations within a member-State transact on similar assets. This is due to the lack of sufficient diversification of financial assets available to consumers between member-States and/or the lack of sufficient and comparable information (on underlying fundamental values, or transaction costs) on those assets, particularly as regards poor or unsophisticated agents who may not be able to either purchase or properly process and evaluate information. If domestic financial systems do not typically provide small value/volume financial services to foreigners, or as information dissemination standards/channels differ or are inadequate, trading on financial assets will not be smooth (Bayoumi, 1997).

The efficiency and effectiveness of financial intermediation is crucial in achieving smooth trading of financial assets. At the presence of financial risks and national borders, it is costly to purchase financial assets in one member-State using another State's financial intermediation services, even though some financial firms in the one State are owned by financial firms of the other State. While, in order to mitigate risk, it is usually possible to purchase assets in one State's stock market and take an offsetting position on that State or another State's derivatives market, this process is still costly: need to provide a margin deposit, to pay a fee to roll over the contract, to achieve best execution. Moreover, the contracts tend to be issued in large units, and the purchaser always needs to have sufficient liquidity to meet margin calls if necessary. In such situations, the implicit cost of using foreign financial intermediation for trading is different in different locations.

These asymmetries contribute to consumers of financial services showing a pronounced home bias in the financial assets they hold. This is true as regards both less risky fixed-income securities and more risky equity securities, but more in the latter. A home bias means that consumers predominantly buy and sell in their home

financial markets. This behavior has the natural hedging advantage that variations in the market value of tradable financial assets are conditioned by variations in the value of their fundamentals, and consequently this home bias is likely to reflect risk aversion, which may be exacerbated by culture. This bias may have two advantages for consumers of financial services living in large member-States: First, buyers and sellers are not limited to diversify over a smaller range of financial assets and thus are exposed to lower market risk. Most Europeans today sell high quality assets not only to their countrymen but also to other Europeans as well as to the rest of the world. Secondly, since real interest rates differ (due to different inflations) across member-States within a monetary union, consumers living in a large member-State which is a capital exporting region face a comparatively smaller risk premium and thus lower interest rates. If consumers located outside a member-State demand a market risk premium in addition to a country risk premium to invest in assets located inside that State, the residents of the State will be required to pay an additional premium to sell, if they are net sellers to the rest of the union (or the world) (Carlson and Osler 1996). Since most financial assets are national, there is little empirical evidence of differences in market risk premiums and country risk premiums within the EU, or i.e. between the EU average, the US and Japan. However, country risk premiums between member-States within a monetary union are typically smaller than risk premiums between States across unions, suggesting that most of the risk is market risk.

Differences in risk premiums between member-States may also be due to the inability of national governments to undertake successful economic policies or encourage repatriation of capital. However, small EU member-States, that in the post-Euro era saw real interest rate convergence to interest rates in large member-States, experienced that often despite disparate economic indicators such as government deficit levels (Emerson et al 1992; Tatom and Proske 1994). Following the adoption of the Euro, small member-States sellers of financial assets primarily face a market risk premium rather than a country risk premium, which lowers the overall post-Euro risk premium they pay, thus raising the real rate of return on financial assets and offering a substantial benefit to their investors.

Home bias in equities is pronounced and is a facet of the lack of integration between States (French and Poterba 1991). In general, since equity price volatility is greater than currency volatility, it seems plausible that the higher home bias in equity securities relative to fixed-income securities within a member-State may not be attributed only to currency risk but also to other factors, such as financial intermediation. Under these circumstances, the post-MiFID impact of different financial intermediation structures on financial integration may be felt not only within the EU but mainly in the degree of integration between the EU with the rest of the world.

It is becoming increasingly evident that the degree of home bias is falling over time, as investors in most States hold an increasingly large fraction of

their portfolios in foreign financial instruments. Still, the degree to which most portfolios are home biased is enormous, and if this bias partly reflects currency and financial intermediation issues, an enlargement of the monetary union and the harmonization of financial intermediation structures and processes will improve domestic overall welfare by reducing the degree of home bias.

It is safe to argue that MiFID will contribute to the reduction of home bias, since it departs from the previous ISD-based practice, where EU investment and thereby member-State economies have been largely country and not sector based. Fundraising and IPOs in the EU today are mainly country-based and not cross-border. The EU financial services industry is therefore fragmented, financial intermediaries are closely owned and managed and only recently has consolidation among investment firms and exchanges started to materialize, but still this is observed more within member-States than between States. Clearing and settlement is most fragmented and therefore expensive.

The effectiveness of MiFID in reducing home bias in the trading of financial assets and in materializing the benefits of the widened availability and diversification of finance will depend on whether post-MiFID European consumers of financial services do actually obtain a true choice of "passported" financial intermediation services (order execution, advice and record keeping), a true improvement in their access to diversified financial assets across the EU and a true reduction in transaction costs by receiving best execution at no compromise to adequate protection of their interests.

The 3rd stage in the Lamfalussy process of MiFID implementation is crucial in preventing the undue introduction of new restrictions on financial instruments, thus preserving liquidity in the market. The reduction of home bias will also depend on whether post-MiFID European financial intermediaries do obtain a free choice of and true access to markets and market data as well as to information about issuers, a true access to all EU clients, clearing and settlement infrastructure at low cost and a real opportunity to innovate in response to diversifying European consumer demands.

To the extent that post-MIFID European exchanges will manage to acquire improved access to a wider range of brokers and investors and to provide cost efficient clearing and settlement services, thus facilitating the admission of diversified corporate securities for trading in the equally diversified market segments under their operation, one would expect an improvement in the reduction of home bias. The likely improvement will also largely depend on the true opportunities provided to as well as the response of corporations: will they get adequate access to admission of their securities on European regulated markets and see them trading on alternative systems at low cost? The actual impact of MiFID on the average cost of capital in the EU and thus on market liquidity is a crucial factor in this respect.

It must be stressed that structural fragmentation of markets impedes financial intermediation efficiency but, we shall see later, may serve as a

cushion against extreme manifestation of systemic risk. Thus, the effectiveness of MiFID in reducing the adverse effects of market fragmentation may come at the cost of raising the likelihood of systemic risk.

2.2 Macroeconomic issues

The role of financial markets in bringing savings and investment decisions by individuals into balance is crucial. Feldstein-Horioka (1980) found that domestic savings rates are typically highly correlated with domestic investment rates, suggesting that there is a small degree of international financial market integration, for if integration were deeper savings decisions in one location would be independent of investment decisions in that location. This result sparked considerable debate. On the one hand, the F-H result seems generally to hold: States do not seem to use as much as they could financial markets to fully separate savings and investment decisions, to diversify risk and smoothly absorb exogenous shocks (Obstfield, 1986; Lewis, 1995; Bayoumi, 1997; the literature grows large). Thus, current account imbalances in many States seem to be conditioned by capital account inflexibilities. On the other hand, there is considerable evidence against the F-H result: correlation between national savings and national investment is weaker than previously thought and is declining over time (Blecker, 1997; Gordon, 1996, 1997). The fact that EU current account deficits have been large and variable is not consistent with the F-H result, and thus domestic savings may not be considered as constraining EU investment.

There are two types of evidence indicating that national borders and separate financial intermediation structures limit financial market integration. First, personal savings and investment decisions are basically uncorrelated in separate regions within States, in contrast to the high degree of correlation between States, implying a higher degree of capital market integration within States (Bayoumi 1997; Helliwell, 1998). This evidence is supported by a historic analysis of cross-country savings and investment flows during the Gold Standard era. Bayoumi (1997) points out that, prior to 1914, exchange rates were fixed and capital was highly mobile, and the correlation between savings and investment in different States was considerably smaller than it is today. Irwin (1996) offers a slightly different interpretation, by arguing that capital market integration was high during the Gold Standard era for only a limited variety of heavily traded financial assets existed at the time. This evidence is interesting as it suggests that the issue is not only one of international borders, but of currency and structural regimes as well. In addition to the role of different currencies, the role of Government in economies was much smaller and financial intermediation was limited and less sophisticated during the Gold Standard era than it is today, and Governments had a legitimate role or incentive to intervene in the international gold market or in the regulation of financial firms for domestic policy reasons. In contrast, modern Governments do worry about the current account position and the efficiency of financial regulation, and can find

intellectual reasons and market/corporate failures to justify intervention if they so wish.

The second body of evidence concerns the degree of risk transfer/sharing between and within member-States. In theory, consumers should be able to use capital markets to buy and sell financial assets in response to income shocks and to hedge against income fluctuations. Either way, consumption should be less volatile than income. International evidence shows that there is little international risk transfer of this sort: overall domestic consumption tends to be highly correlated with domestic GDP and little correlated with consumption in other States. In a world of risk-averse agents, this appears to be an anomaly, for there appear to be significant welfare gains from wider (international) risk transfer (van Wincoop, 1994). Growing evidence shows that risk transfer between States is considerably smaller than risk transfer between regions within States, suggesting that borders do matter (Bayoumi and Klein, 1997; Asdrubali, Sorensen, and Yosha, 1996). There is evidence that risk concentration takes place in specialized institutions (BCBS, 2003; Wagner and Marsh, 2004). This evidence also suggests that international borders affect risk transfer/sharing of capital income much more than labor income, for the simple fact that labor income risk is transferred by using much less capital markets within or between States and much more fiscal transfers. This evidence is clearly consistent with the other evidence that savings is less correlated with investment within States than between States.

Thus, differences in capital flows within States and between States are caused not only by border issues but also by currency and structural issues. It seems moreover reasonable to suppose that capital flows within States intensify because transfers within the financial system of a monetary union are more or less automatic, aided by modern technology advances. Consequently, it seems likely that a country that chooses to have its own currency and financial intermediation structure chooses to limit the extent to which it enjoys capital market integration and risk transfer - and that these costs are likely to be higher for small States than for large States because of the lower degree of risk diversification most likely available in a small country.

The overall conclusion would appear to be that national boundaries and financial intermediation differences are important impediments to the free flow of both capital and goods between individuals. The global economy appears to have some troubles at border crossings.

The implementation of MiFID is expected to widen risk transfer possibilities in the EU and overhaul financial intermediation, thus contributing to the reduction of member-States capital account inflexibilities. In addition to widening markets and market access and thus diversification of financial assets, MiFID provides that investment firms should have sound administrative and accounting procedures, internal control mechanisms, effective procedures for risk assessment and effective control and safeguard arrangements for information processing systems. Moreover, Level 2 measures require firms to ensure con-

tinuity and regularity in the performance of investment services and activities and therefore employ appropriate and proportionate systems, resources and procedures.
To effectuate efficient risk transfer, EU national regulators too must be ready: they will have to acquire adequate regulatory powers and exercise their supervisory duties in an effective way, that is to practice effectively substantial open market consultation and share information with a now wider range of market participants, and cooperate with each other on proportional regulation, in the best interest of investors and issuers, of intermediaries and markets.
Investment and savings decisions do, moreover, depend on tax, legal and contractual policies as well as on intermediation structures and cultural characteristics. Thus, if the allocation of savings and investment decisions is to be improved by more extensive use of financial markets, member-States will have to undertake proper policy measures to regulate domestic business activity, and overhaul impeding structural rigidities. However, it will not be regulation itself that will ultimately bring financial integration, but the actions of market participants (investors, issues, intermediaries) that will deliver the true benefits.

2.3 The issue of systemic risk

The achievement of financial market integration in the EU rests not only on the removal of inefficiencies and market failures due to asymmetries of information between individual savers and market professionals, but also on the need to contain systemic risk. That is the risk that financial decisions of individuals and firms pose for the viability of the economic system as a whole. Financial risk-taking is a concern of national and EU public policy because risk-taking actions of individuals are associated with externalities, i.e. costs and benefits accruing to the society that are external to the calculations of the individual investor, and not accounted for in the market place. In an economy, where there are important externalities, competitive capital markets will be socially inefficient. Proper financial regulation should aim at mitigating these inefficiencies.
The origins of the externality of systemic risk are in large part manifest through Keynes's idea of the "beauty contest". In Keynes's contest beauty, the game is won not by those who best assess beauty objectively but those who can accurately assess what others think is beautiful. In financial markets, the key to knowing how markets will behave is knowing what others believe to be true. The market is driven by participants' belief about what average opinion believes average opinion believes and so on (Keynes, 1936; Eatwell and Taylor, 2000).
If financial markets are to be liquid and reasonably stable then markets should be both large and characterized by a wide range of participants with heterogeneous objectives and with confident expectations that markets will be stable (Persaud, 2000, 2001; Eatwell, 2004).
A market is liquid when buyers are broadly balanced by sellers. Markets become illiquid when objectives are homogeneous. When everyone believes that everyone will sell, liquidity vanishes. Markets fall over the cliff

when average opinion believes that average opinion has lost confidence in financial assets.

Heterogeneity is maintained in several ways: when individual investors and traders have different financial objectives, methodologies, institutional structures and infrastructures; when they have differing access to or use of information and so even if their goals might be the same they will behave differently. Moreover, when average opinion believes that average opinion believes that markets are stable, then stability becomes a convention. Convention (meaning belief in stability) is vital in financial markets, because convention creates and sustains heterogeneity. Stable expectations, by defining the expected range of movements in asset prices, set the actual range of fluctuations in current asset prices. But of course once convention is breached, then the crisis will follow. The most powerful convention of all is that imposed by government policy. Heterogeneity is also maintained when investors are forced, by government regulation, into segmented markets. For example, many EU exchanges operate different markets and have set different market access/trading criteria, so as the allocation of savings may be influenced by factors other than price. Until recently financial markets were deliberately fragmented (see the discarded Glass-Stegall Act in the US).

However, during the last two decades the liberalization and internationalization of financial markets has reduced heterogeneity radically. As a result, market segmentation has broken down, cross-market asset price correlations have risen sharply, financial management became professional and financial institutions were transformed into multinational financial conglomerates (BIS, 2001; IMF 2004a, 2004b; Eatwell, 2004). Most investments are now managed by professional institutional investors, who collect, homogenize (i.e. minimize diverse individual savers, standardize financial products) and channel these funds into sophisticated markets.

Professional fund management has reduced the heterogeneity of investor preferences as expressed in the marketplace. The professional investor is subject to a continual competitive pressure to maximize (short-term) returns, and is constrained by the well known institutional dilemma that “it is better for reputation to fail conventionally than to succeed unconventionally” (Keynes, 1936). Thus, on the one hand, there is convergence on “professional” or “conventional” strategies by institutional investors and, on the other hand, there is demand for professional information services – standardization, production and dissemination of financial and non-financial information – and both are homogenizing the market.

Conglomeration reinforces too homogenization. As conglomeration proceeds risk management procedures acquire common characteristics throughout the financial sector, whether in banking, securities or insurance. Activity and risk management techniques change from previously sector-specific to now firm-specific applied across sectors and across borders.

The use of the common currency in the EU, the pegging of some small States currency to that of large States

and the high-level dollarisation / euroisation of key product and financial transactions have also reduced the heterogeneity of policy response. National policy institutions that wish to pursue distinctive policies in response to specialized domestic needs, find their policy effectiveness significantly diminished and market institutions find themselves increasingly difficult to deal effectively with asset/liability mismatches (IMF 2004b). Finally, increased risk transfer, which is a crucial factor for financial market integration, exerts homogenizing effects. In principle, risk transfer should enhance the heterogeneity of risk bearing and risk transferring toward those with an appetite for risk. However risk transfer may not occur smoothly and lead instead to significant risk concentration in certain financial intermediaries or in those investors/institutions with only greater appetite for risk but no greater capability for managing risk (BCBS, 2003; Wagner and Marsh, 2004). It is inevitable that this behavior extends over non-financial institutions: the efficient management of financial risk by non-financial risk purchasers will tend to converge with efficient management of financial risk by financial institutions.

Financial sector regulators are tending to reinforce this homogenizing process. The most important reaction to the recurring crises that have followed the process of liberalization since the 1970s has been the development of international regulatory standards and procedures (see Financial Stability Forum on the list of ten groups of principles for international financial stability).

The provisions of MiFID follow too this tendency. The Directive places, however less forcefully than CAD III, considerable emphasis on the role of firms' own risk management procedures and on market discipline (Art. 13 and Level 2 text on investment firms' organizational requirements). The mitigation of systemic risk, which is an externality, is left to the investment firms' internal procedures, not accounted for in the market place. The incentives on firms to use their own internal risk management systems means that, given that such systems are market sensitive, the specification of risk management models will differ little in detail, since they are constructed on similar analytical principles, estimated on similar historical data, and are sensitive to the same market information.

Good risk management will result in firms holding a portfolio of assets that are not volatile and the prices of which are not normally highly correlated. Suppose however that the volatility of a given asset rises sharply, the models will tell all the firms to sell. As all try to sell, liquidity dries up. As liquidity dries up, volatility spreads from one asset to another. Such spread will, under MiFID's provisions on generalized transparency, will be quick. Previously uncorrelated assets are now correlated in the general sell-off, enhanced by the model driven behavior of other institutions caught up in the contagion. Whilst in normal times such models may encompass a wide range of behavior, in extreme circumstances the models will encourage firms to act as a herd, charging toward the cliff edge together (Persaud, 2000).

MiFID introduces the operation of different execution venues as well as greater transparency requirements for trading in financial instruments, which are common across different venues. Regulated markets and MTFs operating a continuous order book have the obligation to show the aggregated number of orders for each share at each price level for at least the 5 best bid and offer price levels for each share. Quote-driven markets must show continuous 2-way (exceptionally 1-way) quotes for all market-makers. Markets operating a periodic auction order book have an obligation to show the price for each share that would best satisfy the trading algorithm and the potential number or shares executable at this price. Hybrid markets (order book with market-maker support) must 'maintain a standard of pre-trade transparency that ensures adequate information as to the level of orders or quotes and of trading interest in that share at any particular time is made publicly available. All that information must be produced in a homogeneous form and disseminated quickly and simultaneously across Europe.

The emphasis on greater and standardized disclosure of transactions information contributes to the reduction of the information diversity that has in the past created diversity of views. In the post-MiFID era information will be ever more readily available, and disclosure of price sensitive information is legally required. Insider dealing on private information is, rightly, characterized as market abuse. But the attainment of equal information is bought at a cost: increased homogeneity and hence potentially reduced liquidity.

With MiFID, national regulators respond to the creation of broadening financial markets and conglomerated financial firms and institutions, by requiring that they all operate within the same regulatory regime (same rules, incentives and sanctions). The homogenizing pressure exerted by the regulators is evident in the various consultation papers issued by EU national regulators on the domestic implementation of MiFID, particularly those related to the organizational systems and controls, which apply alike to all regulated firms. So the competitive pressure for homogenization throughout financial markets underlies MiFID's provisions too.

The stability of the EU financial integration process may not be enhanced by the implementation of MiFID. There remains the regulatory task of effective containment of systemic risk not only within the EU but globally, which requires the understanding of the link micro risk to the performance of the macro economy (Eatwell and Taylor, 2000). As stands today, MiFID like CAD III offers little guidance on the attempt to link the microeconomic risk-taking to the risk created by the interactions of financial firms. The whole is not just greater, but behaves very differently, from the sum of the parts. It is not that the key issue of homogenization is not addressed, but concentrating on micro structures alone is not enough.

The approach MiFID takes to reform European capital markets increases the homogeneity in behavior, does not take account of the inter-relationship between micro-economic risk taking and macroeconomic performance, and

is bound to operate within the historical perspective of the nation state. In these circumstances, the likely consequences cannot be clearly estimated. There is a need, more strongly felt by smaller member-States, for a detailed consideration of the relationship between enhanced risk management techniques and homogenization. In normal times, when risk is predominantly confined to the individual institution, modern risk management is likely to reduce the probability of failure, and thus enhance stability. Modern risk management will tend to keep firms further from the cliff edge. But it is when the interlinkages between firms and markets come to dominate behavior, i.e. at times of extreme events, that the homogenizing impact of similar risk management techniques is likely to predominate, increasing instability and market volatility. Effective regulation in normal times creates destructive behavior at times of crisis.

In order to reap the benefits of an open post-MiFID European financial market system, there has to be recognition of the risks imposed on society by individual risk-taking investors, and that investors are made to bear a fairer proportion of the social costs of those risks. This means that in the post-MiFID era, regulators must establish efficient mechanisms against financial insolvency of investment firms. It is necessary that during the implementation of the 3rd stage of the Lamfalussy process of MiFID's implementation national regulators develop a flexible structure of rules and rule-making, whilst at the 4th stage, the European Commission needs to exercise an appropriate surveillance, particularly as regards smaller member-States, allowing for certain macro-economic controls in addition to the intensive firm-level regulation, with a special view to systemic issues. Finally, the domain of the regulator needs to be closely aligned with the domain of the market. Thus, the primary regulatory functions – authorization, rule-setting, disclosure of information, surveillance, and enforcement – must be performed in a coherent manner across the EU.

3. CONCLUSIONS

Financial market integration implies that prices of similar assets in different regions are the same (except for different transactions costs) and agents in different regions have access to and trade financial assets from different regions as part of their decisions to save, borrow, invest, and hedge against risk, thus raising the availability and diversification of finance. In the EU financial market integration was achieved mainly by the adoption of a single European currency and the harmonization of financial law. The latter is consolidated by the implementation of the FSAP, a centerpiece of which is MiFID. MiFID will contribute to EU financial market integration to the extent that its implementation succeeds in smoothing-out divergent transaction costs through increased transactions transparency and freedom of activity, and in enhancing the level and diversification of finance through the elimination of impediments on cross-border transactions. These asymmetries contribute to consumers of financial services showing a pronounced home bias in the financial assets they hold.

A home bias means that consumers predominantly buy and sell in their home financial markets.
MiFID will contribute to the reduction of home bias, since it departs from the current ISD-based practice, where EU investment and thereby member-State economies have been largely country and not sector based. However, the overall effectiveness of MiFID in reducing home bias will depend on whether European producers and consumers of financial services do actually obtain a true access to the European capital market and a true reduction in transaction costs by receiving best execution at no compromise to adequate protection of their interests.
Moreover, the implementation of MiFID is expected to widen risk transfer/sharing possibilities in the EU thus overhauling financial intermediation. To effectuate efficient risk transfer, national regulators will have to acquire adequate regulatory powers and exercise their supervisory duties in an effective and coordinated way. However, the achievement of EU financial market integration rests not only on the removal of inefficiencies and market failures due to asymmetries of information but also on the need to contain systemic risk. That is the risk that financial decisions of individuals and firms pose for the viability of the economic system as a whole. If financial markets are to be liquid and reasonably stable then markets should be both large and characterized by a wide range of participants with heterogeneous objectives and with confident expectations that markets will be stable.
The approach MiFID takes to reform European capital markets is not very encouraging: its implementation will tend to increase the homogeneity in behavior, does not take account of the inter-relationship between micro-economic risk taking and macroeconomic performance, and is bound to operate within the historical perspective of the nation state. In these circumstances, the likely consequences cannot be clearly estimated.
In order to reap the benefits of an open post-MiFID European financial market system, there has to be recognition of the risks imposed on society by individual risk-taking investors, and that investors are made to bear a fairer proportion of the social costs of those risks. This means that in the post-MiFID era, regulators must establish efficient mechanisms against financial insolvency of investment firms.

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Chapter 4 - Asset Classes
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Chapter 8 - Taxation and Trusts
- Corporation Tax
- Personal Taxes
- Overseas Taxation
- Trusts

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- Risk and Return
- Role of the Portfolio Manager
- Fund Characteristics

Chapter 10 - Performance Measurement
- Performance Benchmarks
- Performance Attribution
- Performance Measurement

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Achilleas Zapranis
Stratos Livanis

Forecasting the Day-Ahead Electricity Price in Nord Pool with Neural Networks: Some Preliminary Results

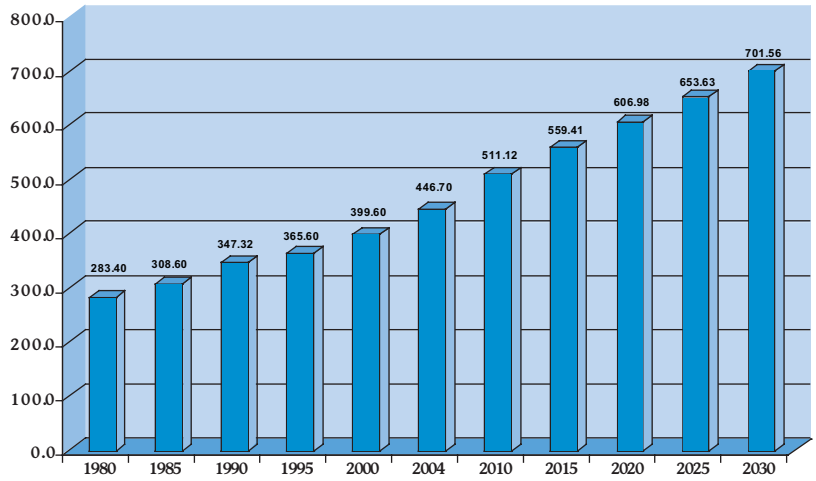
Abstract
The ongoing deregulation of electricity sector worldwide has developed a competitive environment. These new challenges contribute to the development of a more reliable energy supply mechanism with lower cost and to the development of electricity exchanges. A better forecast of the expected electricity price helps market participants to improve their bidding strategies. In this paper, we try to investigate if a non-linear neu-ral network estimator can provide some incremental value vs. a linear model. Our results which are in line with those of similar studies indicate that the nonparametric approach can improve the forecasting ability of linear models. Further work can be considered in the field of estimation of neural network interval forecast and the combination of wavelet analysis and neural network modeling.

1. Introduction

According to International Energy Outlook 2007[1] the total world demand of energy is projected to increase through 2030 about 95% for the non-OECD region and 24% for OECD nations. The difference between OECD and non-OECD nations refers to the ongoing rates of economic development and population growth in non-OECD region. Especially, much of the growth in energy demand occurs in non-OECD Asia, mainly in China and India.

Also, according to the above research total electricity demand is expected to grow up to 2030 by 2.4% percent per year. Again, much of the growth in electricity demand is expected to non-OECD nations, where the today's per capita demand is minimal with regard to electricity demand in the OECD region. However, total electricity demand in the non-OECD nations is expected to grow up to 2030 at an annual rate that is nearly triple the rate of growth for electricity demand in the OECD nations. So we can conclude that there are issues of electricity competence, if non-OECD nations continue the development with fast paced growth according to the western manu-facture model.
Especially for European Union,

Figure 1:
World energy consumption, 1980-2030. Source: Until 2004: Energy Information Administration (EIA), International Energy Annual 2004 (May-July 2006), web site www.eia.doe.gov/iea. Projections: EIA, System for the Analysis of Global Energy Markets (2007).



(according to GREEN BIBLE[2]) during the next 20 years there is the necessity of about one trillion euro investments, in order to supply the expected energy demand and to replace the old infrastructures.

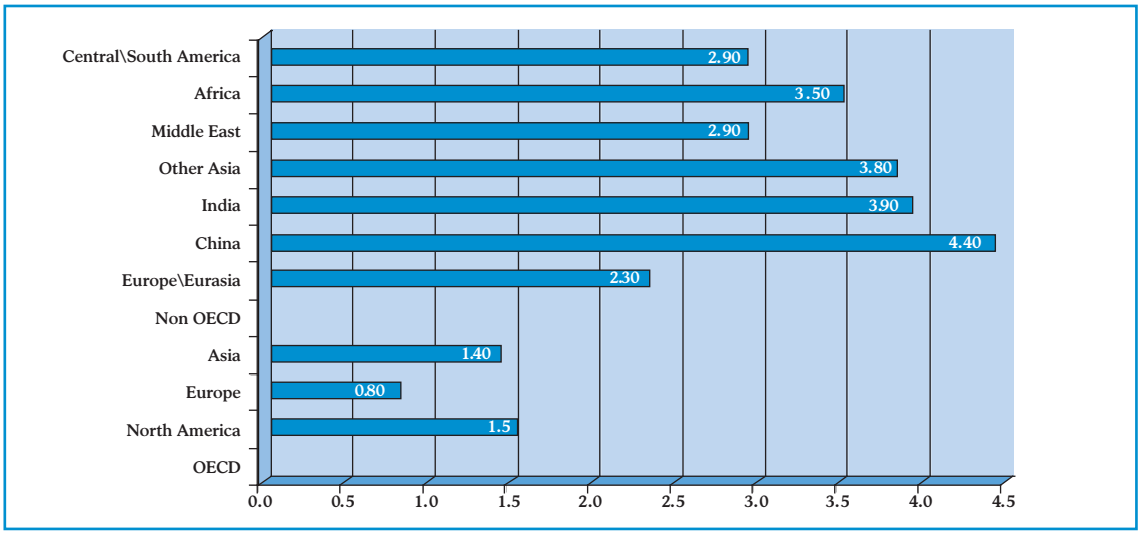
Together, while there is a growing dependence of European Union from energy imports, domestic energy should become competitive, otherwise during the next 20 to 30 years 70% of European Union energy demand (towards 50% which is nowadays), will be accomplished with imported energy products – some of them from regions with political uncertainty. Moreover, the full connections of national electricity networks and the development of pan-European electricity networks have created new challenges for players in the energy market. So there is an ongoing number of new electricity producers, while existent producers extend or renovate their electricity plants.
The primary goal of the energy deregulation is to encourage competition between the producers (old monopolists and new entrants in the electricity market). As a result there is a tendency of reduction in electricity prices but also an increasing volatility while market participants face potential increasing risk. Together, with the deregulation of electricity sector in U.S.A., Canada, and E.U there is a growing interest for the development of electricity exchanges.

The ongoing deregulation of electricity sector worldwide has developed a competitive environment. These new challenges contribute to the development of a more reliable energy supply mechanism with lower cost. The deregulation of electricity markets, in combination with strategies for environmental sustainability, are crucial factors of this international energy transitional stage.

With the development of energy exchanges producers and consumers

of electricity can manage the risk they faced while they can buy or sell electricity using the spot and future electricity market. However, there are serious differences between electricity and traditional financial products (such as equities) or commodities (such as oil or gas).

Figure 2:
Expected annual growth of electricity generation, OECD and non-OECD nations, 2004-2030.
Source: 2004: Energy Information Administration (EIA), International Energy Annual 2004 (May-July 2006), web site www.eia.doe.gov/iea.
Projections: EIA, System for the Analysis of Global Energy Markets (2007).



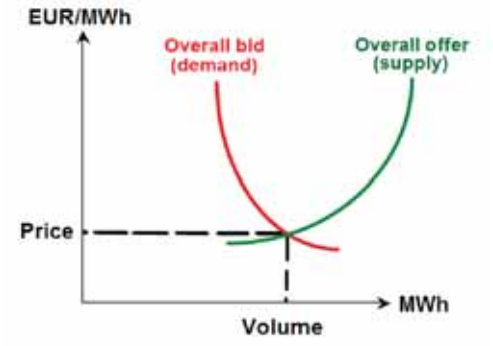
The ongoing deregulation of electricity sector around the world has contributed to the development of electricity exchanges. Electricity market participants can buy or sell current or future blocks of electricity and so to stand up overproduction or shortage and manage the risks they are faced with. These reasons have pushed the last decade the scientific community and market participants to the development of predictive models for electricity prices. A better forecast of the expected electricity price helps market participants to improve their bidding strategies.

Moreover, an accurate electricity price forecast can improve the development of pricing models used to value power derivatives and so energy companies, customers and investors manage the risks that arise from the high volatility of electricity prices. Also, electricity producers and con-sumers using an accurate forecasting model can efficiently decide how much energy to buy or sell through bilateral contracts. In this paper, we try to investigate if a non-linear neural network estimator can provide some incremental value vs. a linear model. We use as inputs the electricity price of 7, 14, 21, 28 and 35 days before (as Pao; 2007 also used). The architecture of the network model developed on the basis of "the minimum prediction risk principle" according to Zapranis, Refenes (1999).

The rest of the paper is organized as

follows: In the next section we present the main characteristics of electricity exchanges. In section 3 we give a review of the relevant literature on forecasting electricity prices. In section 4, we present our data, give our forecasting framework and we explain how a neural network can be use for predicting future returns. In section 5, we present our results and in section 6 we conclude.

Figure 3:
Supply and Demand Curve



2. Electricity Exchanges

The main characteristic of electricity is its non-storability. Because of this, electricity has to be consumed exactly at the same time as it is produced. Consequently, there is the need in energy market for real time balancing of supply and demand. This means that prices rise or fall in a short time until supply and demand become equal. According to Eydeland and Wolyniec (2003) the supply of electricity involves three types of activities:

- Generation : The conversion of coal, nuclear, gas, oil, hydro, solar, wind, biomass and waste power to electricity.
- Transmission : The bulk transport of electricity at high voltage.
- Ancillary services: The necessary services to support the transmission of energy from resources to loads while maintaining.

The maintenance of the electricity system requires an independent system operator (ISO). The ISO ensures reliability and safety of grid, fairness and transparency. Also provides incentive for building transmission capacity, schedule and dispatch various generation and load facilities. The system operator in a deregulated market has to be a non-commercial organization and independ-ent with regard to the market participants. The ISO should not own any generating assets that could benefit from its decisions. In addition, the independent system operator has the superior, physical ruling and control of the energy sys-

tem in his area.

Together with the necessity of independent system operator, deregulation of the electricity market has led to the emergence of energy exchanges. The participants of these exchanges are energy producers, retailers, end users and traders. Energy exchanges create liquidity of markets and reli-able and objective energy prices. They also guarantee[3] electric power transparency and handle bottlenecks in the grid in a market-wise way. In addition, the power exchange secures that for every hour of operation all the capacity of the bottleneck is utilized. In figure 4 we can see the power exchanges in Europe. Each power exchange has its own pricing mechanism, products and settlement principals.

Generally, power exchanges comprise the spot market and the financial market. The spot market is in reality a day-ahead market on which physical delivery of energy takes place. The day-ahead market comprises contracts that cover the 24 hours of the next day, in which participants may buy and sell electricity. The participants submit offer or bid orders for individual hours. The offer orders are aggregated to form the supply curve, while bid orders are aggregated to form the demand curve.

In table 1 we can see the electricity exchanges in Europe. The larger are the UK Power Exchange (UKPX) in UK, the NordPool in Scandinavia and the European Energy Exchange (EEX) in Germany. UK Power Exchange (UKPX) established in 2000 as Britain's first independent power ex-change, APX Power UK. On 30 June 2004 was acquired by APX and its exchange services were merged with APX UK while the trading platform was migrated to APX's EuroLight system. Nord Pool was established in 1993 and it is is the world's larger multinational exchange for trading electric power. It has branch offices in Stockholm, Sweden in Fredricia,

Table 1 : Power Exchanges in Europe

Exchange	Web-Site	Location
APX Power UK, NL	http://www.apxgroup.com	U.K, London, The Netherlands, Amsterdam
NordPool	http://www.nordpool.com	Norway, Oslo
EEX	http://www.eex.com	Germany, Leipzig
Powernext	http://www.powernext.fr	France, Paris
EXAA	http://e.exaa.at	Austria, Vienna
OMEL	http://www.omel.es	Spain, Madrid
IPEX, Italian Power Exchange	http://www.mercatoelettrico.org	Italy, Rome
Polish Power Exchange	http://www.polpx.pl	Poland, Warszawa
Borzen	http://www.borzen.si	Ljubljana,
OTE (Oper˘tor trhu s elektóinou, a.s.)	http://www.ote-cr.cz	Czechia, Praga
OPCOM (Romanian Power Market)	http://www.opcom.ro	Romania, Bucuresti

Denmark and Hel-sinki, Finland. European Energy Exchange offers spot and derivatives trading regarding power, gas, emission allowances and coal. It is the result of the merger between LPX Leipzig Power Ex-change and the Frankfurt-based European Energy Exchange.

The spot contracts depend on the duration of delivery. There are hour contracts where the deliv-ery of elec-tricity with a constant output over a specified delivery hour is traded, and block con-tracts where the delivery of power with a constant delivery output over several delivery hours is traded. The indicative products traded on the day-ahead market are mainly those in panel 1.

In addition, almost every electricity exchange has an electricity index which is the reference price for power in its area. There are the base load index which is the average of the hours 1 till 24 for electricity traded on the spot market, and the peak load index that represents the average of the hourly prices in the peak load hours 08:00–20:00.

Final, there are power exchanges with an intra-day market. Intra-day market trades in power con-tracts for delivery on the same or following day. Electricity can be bought or sold in respect of each individual hour of the current day with a cut-off point 75 minutes prior to delivery.

Together with the development of spot market, most electricity exchanges operate a financial market for price hedging and risk manage-ment consists of markets for futures, forwards, options and contracts for differences.

Panel 1

Day-Ahead Contracts	Base (00-24h)	Peak (08-20h)	Offpeak (00-08/20-24h)	Office (09-16h)	Offpeak1 (00-08h)
Dream (00-06h)	Lunch (10-14h)	Teatime (16-20h)	Moon (01-04h)	Sun (05-08h)	Offpeak2 (20-24h)

3. Forecasting Electricity Prices: A Literature Review

Although there is a growing interest in the prediction of day-ahead electricity prices, due to the complexity and newness of the problem few studies have approached this subject. Wang & Ram-say (1998) proposed a neural network model to predict system marginal price (SMP) with empha-sis to weekend and public holidays UK power market. The training of the model for the weekends was performed using data (settlement period index, estimated demand, ID flag, historical SMP) from April 1995 to March 1996 apart from June and July 1995 which were used for evaluation. For the public holiday period their proposed model training using data for the previous and last weekend of New Year Day (1996). The estimated MAPE was found to be from 8,93% to 12,19%.

Darbellay and Slama (2000) studied the behavior of the electric load time series of the Czech Republic. First, using linear and nonlinear autocorrelation functions they found weak nonlineari-ties between the sample general autocorrelation and the sample linear autocorrelation. Then, they compared the predictions of a neural network model and an ARIMA model for electric consump-tion. The estimated period was the year 1994 and the tested period was the year 1995. The per-formance of the models was measured by the normalized mean square error (NMSE), the mean absolute error (MAPE) and the maximum absolute percentage error (maxAPE). They found that forecasting the electric load in Czech Republic is mainly a linear problem while both models achieve almost the same results. For this reason they support that one should check if a problem is linear and then use a complex non linear model.

Kim et al (2002) used a novel wavelet transform based technique for prediction of the system marginal price (SMP) of the UK power pool. For the implementation of their methodology they used input data of settlement period (forty eight intervals) for the winter (January) of 1997, and the forecasted demands for the same period. The wavelet transform is performed to seek the five scaled approximations and the details a_5, d_1, d_2, d_3, d_4, d_5. The regression coefficients are calcu-lated using Daubechies d_1(Haar), d_2, d_3, d_4, d_5 and forecasted demand, and the demand applied wavelet coefficients is predicted. The SMP forecasting is then finally implemented using the pre-vious day's low frequency and the forecasted high frequency components. Finally, the percentage error of the forecasted results is calculated to test the accuracy of the model. According to their findings, Kim et al (2002) supported that the proposed methodology gives promising results (per-centage prediction error of week days of approximately 6.03%) for the system marginal price prediction.

Yamin et al (2004) proposed a neural network model for the adaptive short-term electricity price forecasting using data from the IEEE 118-bus system of California power market. The accuracy of the model was tested with MAPE and a proposed version of MAPE uti-

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lizing the median. They found that considering only the historical price as input to neural network there is the worst forecasting performance. Considering additional load information (historical and forecasted load) as input to neural network there is a better forecasting performance. Moreover, considering the re-serve information (historical and forecasted reserve) as input , the forecasting performance im-proves as compared with that of previous models. So Yamin et al argued, that the more factors we consider in training, the better the forecasting[4] performance will be. Also, they found that adaptive forecasting could provide a better accuracy. Finally, comparing the neural network model with alternative methods they conclude that their proposed neural network model provides better results than alternative methods.

Conejo et al (2005) studied several forecasting techniques to predict the 24 market clearing prices[5] of PJM Interconnection[6] day-ahead electric energy market. They used dynamic regression and transfer function models, ARIMA models, neural networks and a wavelet transform proce-dure. For each model one week per season of year 2002 was studied. The performance of the models for this period was measured firstly by two type of average prediction errors. The one cor-responding to the 24 hour of each day and the one corresponding to the 168 hour of each week. Additionally, Conejo et al computed the forecast mean square error. According to their results the dynamic regression and transfer function algorithms seems to be more effective than ARIMA models. Wavelet models behave similarly to ARIMA models and neural network procedures do not show better performance. Finally, Conejo et al propose for further research the combination of wavelet transform and time series algorithms.

Mandal et al (2006) examined a neural network approach to forecast day-ahead prices and loads for the Victorian electricity market. They used a neural network to forecast one to six hour ahead electricity price and a neural network to forecast one to six hour ahead load. The inputs to the neural networks were the average hourly data of price, load and temperature for the years 2000–2003. Also, Mandal et al proposed an approach of selection of similar days based on an Euclid-ean norm with weighted factors. The one to six hour ahead price forecast errors (MAPE) range from 10.69% to 25.77% and the MAPE result by the proposed neural network model for load forecasting found lower than that obtained from the similar days approach. Finally, Mandal et al compare their results with those of Rahman and Bhatnager (1988), Bhattacharyya and Thanh (2003) and Szkutta et al (1999) where the authors explored techniques of neural networks for short-term price and load forecasting in the Australian national electricity market and in Northern Vietnam. According to Mandal et al their proposed neural network models obtained MAPE results comparatively lower than those of the above references.

Misiorek et al (2006) studied the short-term forecasting power of different time series models (AR/ARX, AR/ARX-GARCH, TAR/TARX and Markov regime-switching models) in the elec-tricity spot market of California. Their findings support that the best results were obtained using a non-linear TARX model and a relatively simple ARX model. Also investigated the interval fore-casting performance of the model following the work of Baillie and Bollerslev (1992) and Christoffersen and Diebold (2000). Misiorek et al found found that again the TARX model gave the best results.

H. T. Pao (2007) employing a rolling cross validation scheme using neural networks for electric-ity prices at the European Energy Exchange for the period 2002 – 2005. The out of sample per-formance evaluated with RMSE, MAE and MAPE across five forecasting horizons. The result according to Pao showed that the proposed neural network model is a more robust multi-step ahead forecasting method than autoregressive error models.

In a later paper, Pino et al (2007) investigate the use of artificial neural networks for the estima-tion of day-ahead hourly forecasts for the energy price in the electricity production market of Spain. They compared the results from the network model with those obtained from Box–Jenkins ARIMA forecasting method. Results showed that neural networks perform better than ARIMA models, especially for weekends and holidays.

Gao et al (2007), investigated the usefulness of support vector machines for the short-term elec-tricity price forecast. A flexible Ci SVR that assigns various Ci, ei to each training data and a clas-sic e-intensive SVR model, were applied to the day-ahead price forecast. The load, time of use index and index of day type were selected as inputs. The models were tested on the Italian, Span-ish, New York and New England electricity market. Again the accuracy of the models was tested using the mean absolute percentage error (MAPE), and the square root of the forecast mean square error (FMSE). The results of SVR model compared with those of two ARIMA models reported in Contreras et al (2003). Gao et al found that compared with the Vapnik e-intensive SVR, the proposed model always presents much better results with the same platform of practical parameters selection. Moreover, with the numerical test, the flexible Ci SVR model seems to have a better performance than the two ARIMA models.

Swider and Weber (2007) studied the stochastic electricity price processes for the German elec-tricity market. They proposed a combination of an ARMA model with Gaussian-mixture and switching-regime approaches. Swider and Weber didn't apply the proposed model to out-of-sample forecasting while they focused to the historic price development. The accuracy of their results was tested using the explained fraction of variance (R2), the mean absolute error (MAE), the mean absolute percentage error (MAPE), the value of the log-likelihood function (LLF) and the Schwarz–Bayes information criterion (SBC). According to their results the

proposed model seems to improve in-sample predictive power and achieve to substantially increase the ability to represent the fat tails in the price distribution.

4. Forecasting the Day-Ahead Electricity Price in Nord Pool

The aim of our study is the prediction of the day-ahead electricity price of energy exchange in Norway (Nord Pool) using linear and non-linear models. Nord Pool has two market places: El-spot, the spot market, and the financial market. Elspot is the day-ahead auction market for trading of electrical energy in the Nordic region. At Elspot, market players can buy or sell electricity for physical delivery the next day in Norway, Sweden, Finland, Denmark and Germany.

Our analysis focuses on base load electricity (electricity in the block hours from 00:00 to 24:00. The price data were downloaded from Nord Pool FTP server http://www.nord-pool.com (1325 daily data for Elspot Base (€/MWh) covering the period from 1 Jan 2003 to 17 Aug 2006). The training data set covers the period from 1 Jan 2003 to 15 Dec 2005 and the test data set covers the period from 16 Dec 2005 to 17 Aug 2006. As a benchmark we used a multivariate linear regres-sion model.

Figure 4:
Day ahead prices for base load electricity from 2003 to 2006 at NordPool

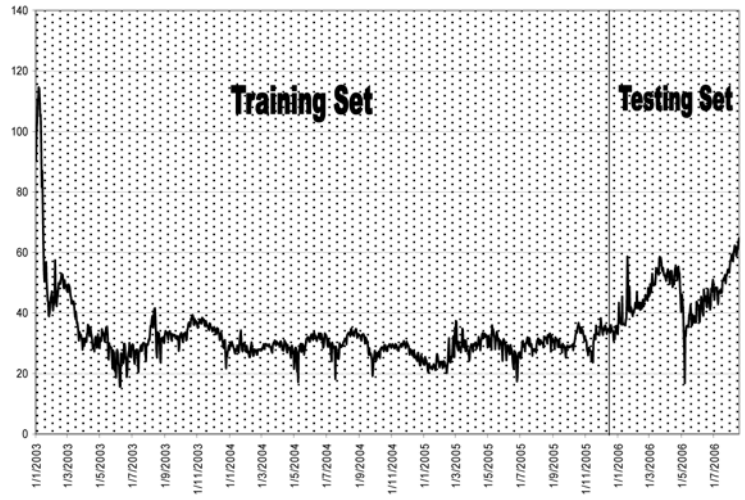
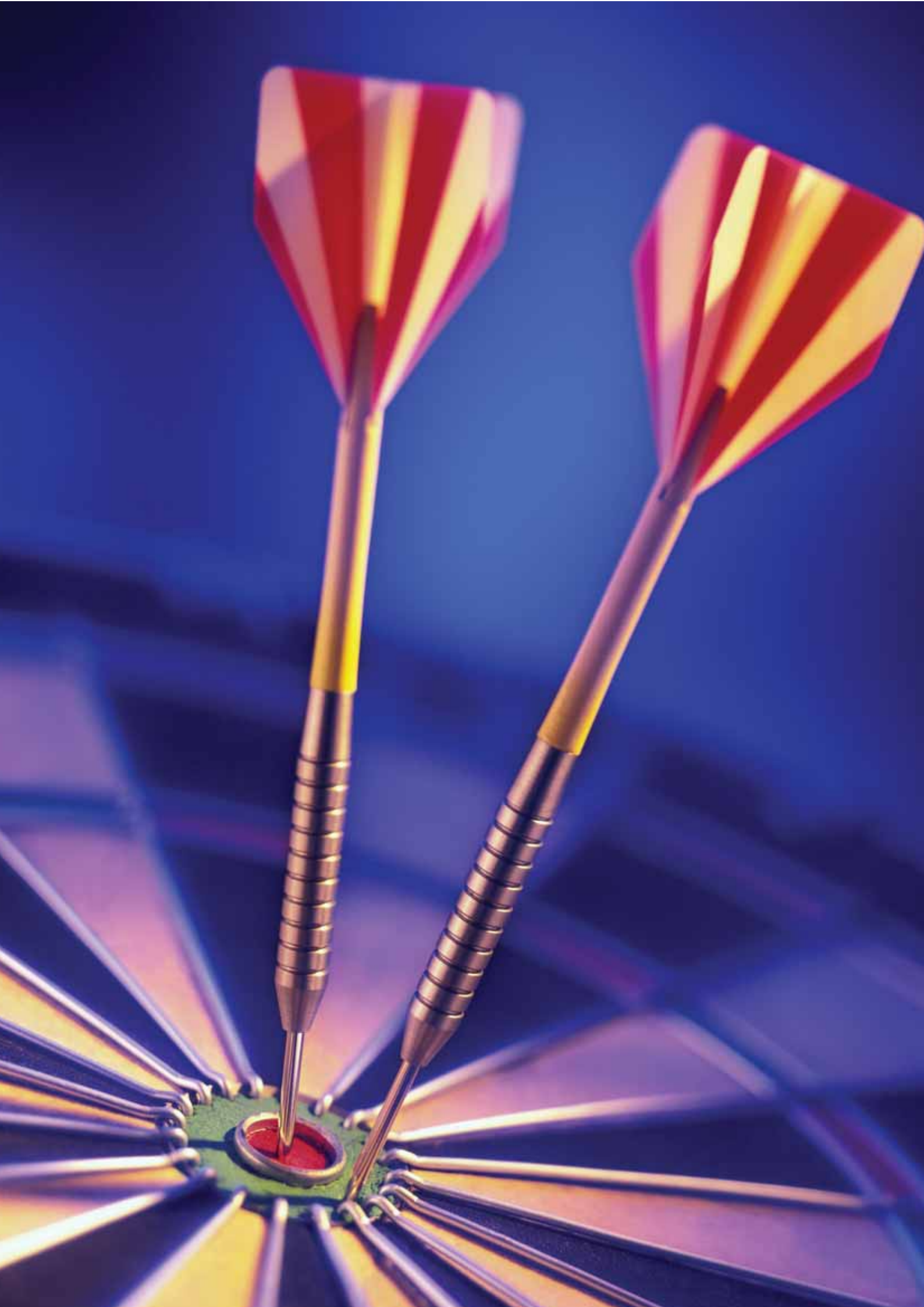


Table 2 : Descriptive statistics for day-ahead base load electricity prices at NordPool

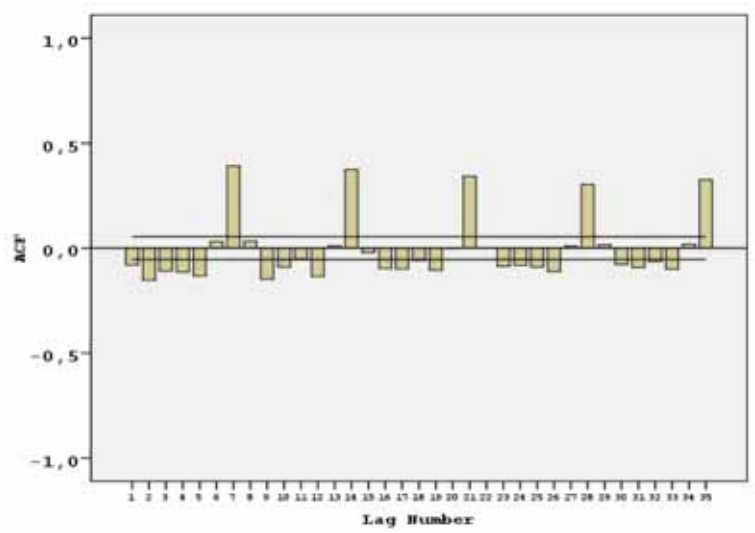
	Min	Max	Mean	Std. Dev.	Variance	Skewness	Kurtosis
Nord Pool: BASE	15.76	114.61	34.2419	10.94085	119.702	3.007 (0.067)	15.041 (0.134)



Descriptive statistics for day-ahead base load electricity prices at Nord Pool are reported in Table 2 while Figure 4 plots this time series. From these, we can observe the main characteristics which are referred to the literature for electricity prices. These are daily, weekly and seasonal cycles, presence of outliers, high volatility, non-constant mean and variance. Also, in Figure 5 we can observe that the sample autocorrelations of electricity price logarithmic returns are statistically large at lags of multiples of 7.

Let us denote as yt the day-ahead

Figure 5:
The autocorrelation function (ACF) for daily electricity logarithmic returns at the NordPool



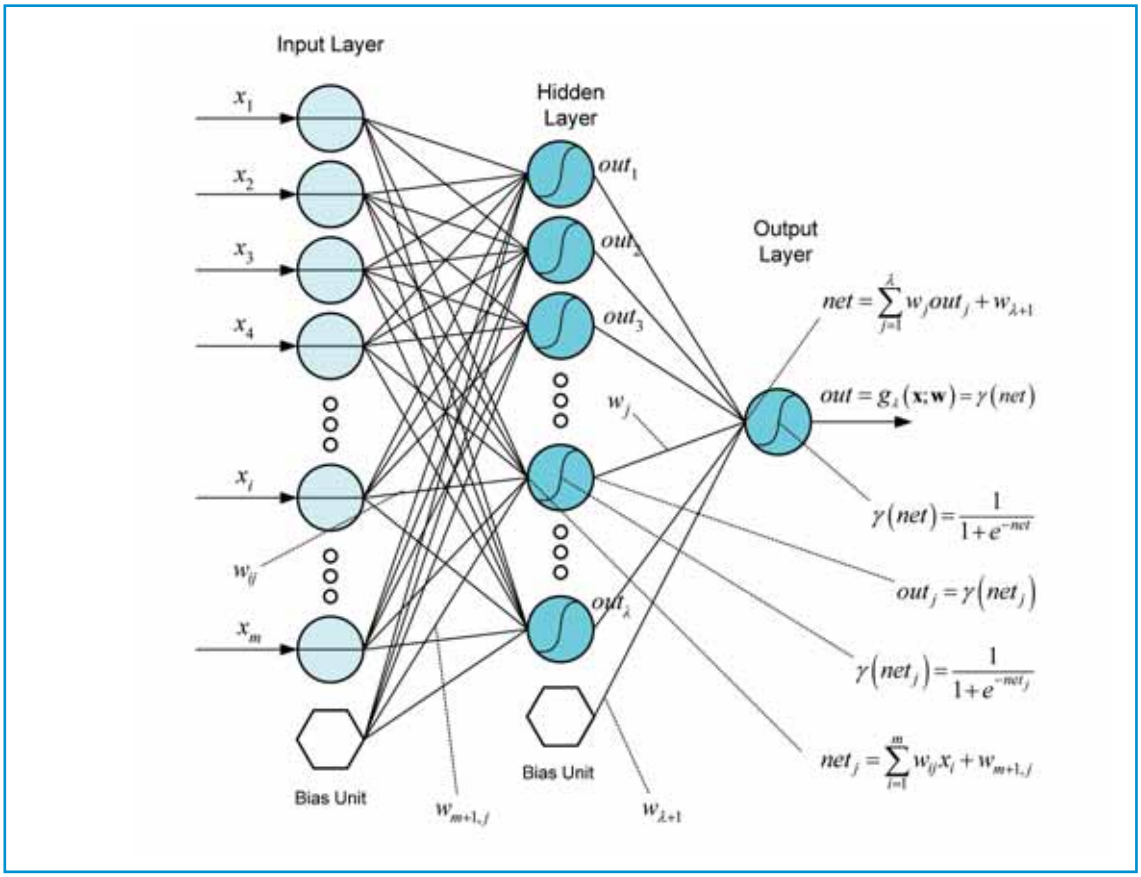
electricity price at day t. In order to predict the day-ahead elec-tricity price yt, we follow Pao (2007) and we use xt = (yt-7, yt-14, yt-21, yt-28, yt-35) as the input vector.

Let us denote with gλ(**x;w**) the output of a fully-connected one-hidden-layer neural network with λ hidden units and a bias term, for a given input vector of past day-ahead price returns, **x**, and a parameter vector, **w**. Instead of assuming a particular parametric form for f(xt | yt) we can estimate it non-parametrically with a neural network, that is we can estimate the day-ahead

$$\hat{y}_t = g_\lambda\left(\mathbf{x}_t \mid y_t; \hat{\mathbf{w}}_D\right) \equiv \xi\left(\mathbf{x}_t \mid y_t\right)$$

where

Figure 6:
Backpropagation neural network with a single hidden layer and a single output unit; from Zapranis (2005).



$$g_\lambda(\mathbf{x}_t \mid y_t; \hat{\mathbf{w}}_D) = \gamma\left(\sum_{j=1}^{\lambda} w_j \gamma\left(\sum_{i=1}^{m} w_{ij} x_i + w_{m+1,j}\right) + w_{\lambda+1}\right)$$

electricity price as follows:
and where $\hat{\mathbf{w}}_D$ denotes the parameter vector which was estimated from the training dataset D with the back-propagation training algorithm, wij is the weight of the connection between input i and the hidden unit j, wm+1,j is the weight of the connection between the bias term of the input layer m+1 and the hidden unit j, wj is the weight of the connection between the hidden unit j and the output unit and wλ+1 is the weight of the connection between the bias term of the hidden layer λ+1 and the output unit (see Figure 6). The function γ is the typical asymmetric sigmoid.

The number of hidden units λ was estimated on the basis of "the mini-

mum prediction risk principle". Prediction risk is the expected out-of-sample mean squared error and it was computed algebraically; for a detailed exposition see Refenes and Zapranis (1999) and Zapranis, Refenes (1999).

In order to have comparable results with other similar studies we measured the out-of-sample per-formance of our models using the following statistics:

$$\textit{Root Mean Square Error}\ (\text{RMSE}) = \sqrt{\sum_{i=1}^{N}\left(y_{\textit{forecasted}} - y_{\textit{actual}}\right)^2 / N}$$

$$\textit{Mean Absolute Error}\ (\text{MAE}) = \frac{1}{N}\sum_{i=1}^{N}\left|y_{\textit{forecasted}} - y_{\textit{actual}}\right|$$

$$\textit{Mean Absolute Percentage Error}\ (\text{MAPE}) = \frac{1}{N}\sum_{i=1}^{N}\left|\left(y_{\textit{forecasted}} - y_{\textit{actual}}\right)/ y_{\textit{actual}}\right| * 100$$

5. Empirical Results

In Table 3, we can see summary performance statistics for the neural network model. Most of the statistics reported there are self-explanatory. Figure 7 depicts the empirical loss (training error) and the algebraic estimate of prediction risk as a function of the number of hidden units. The network minimizing prediction risk had the 5-5-1 topology.

Table 3 : Neural Model Summary Performance Statistics

λ	1	2	3	4	5	6
Average Squared Error (ASE)	0.003407	0.003084	0.002904	0.002846	0.002765	0.002765
Standard error of the estimate (SE)	0.058366	0.055536	0.053887	0.053345	0.052579	0.052585
Mean absolute error (MAE)	0.042667	0.041161	0.040162	0.039818	0.03917	0.039075
Empirical loss (Ln)	0.001703	0.001542	0.001452	0.001423	0.001382	0.001382
Prediction risk (E[L])	0.001749	0.001615	0.001542	0.001528	0.001509	0.00154
Prediction risk st. dev.	0.000015	0.000015	0.000018	0.000017	0.000018	0.000024
Generalised Cross Validation (GCV)	0.003459	0.003175	0.00303	0.00301	0.002965	0.003008
Final Prediction Error (FPE)	0.003459	0.003174	0.003029	0.003008	0.002962	0.003002
R-squared	64.496064	67.875302	69.737029	70.375818	71.163082	71.189624
R-squared (adjusted for d.f.)	63.545692	66.370195	67.865324	68.195164	68.531489	67.928743
R-SQR for the LR of fore-casts vs. targets	66.170865	68.910921	70.337301	70.803893	71.598279	71.512717

Figure 7:
Empirical loss (training error) and algebraic estimates of prediction risk.

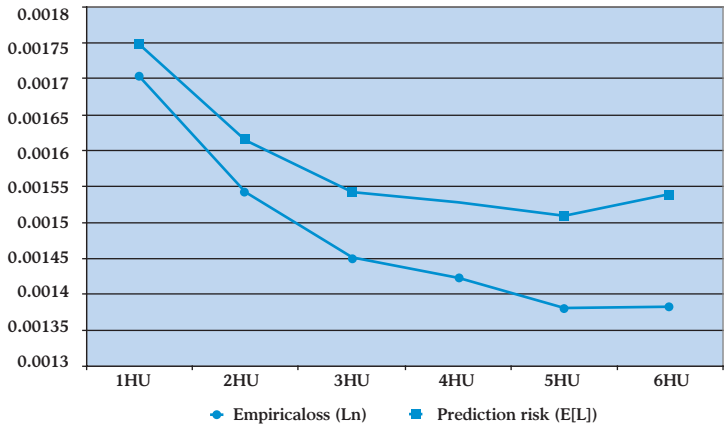


Table 4 reports the out-of-sample performance statistics for EEX according to Pao[7] (2007) and the out-of-sample performance statistics for Nord Pool according to our models. As we can see, the values for all three statistics (RMSE, MAE, MAPE) for the multivariate linear regression model are worse than those of the neural network model.

Table 4 : Out of sample comparison between neural network models and linear models for Nord Pool and EEX (according to Pao, 2007)

	Nord Pool		EEX	
	Neural network 5 – 5 – 1	Naïve linear model	Neural Network 5 – 7 – 1	Autoreg model
RMSE	5.20	6.22	3.21	5.70
MAE	3.37	5.16	2.71	4.79
MAPE	8.17	11.33	9.02	15.16

Our results are similar with those obtained by Pao (2007). RMSE and MAE of our neural network model are slight worse comparing with Pao's results while MAPE (8.17%) of our model is better that that of Pao's (9.02%).

6. Conclusions and Further Work

The ongoing deregulation of electricity sector around the word has contributed to the development of electricity exchanges. Electricity market participants can buy or sell current or future blocks of electricity and so to stand up overproduction or shortage and manage the risks they are faced with. These reasons have pushed the last decade the scientific community and market participants to the development of predictive models for electricity prices. A better forecast of the expected electricity price helps market participants to improve their bidding strategies. In this paper, we try to investigate if a non-linear neural network estimator can provide some incremental value vs. a linear model. Using historical data for the day-ahead electricity market of Norway, we try to forecast the day-ahead electricity price for base load electricity hours. Our results are in line with those of similar studies. Furthermore, the results of our study indicate that the nonparametric approach can improve the forecasting ability of linear models.

We should note that our results are based only on historical electricity prices. So we can expand our neural network model using accessional inputs such as electricity demand, weather temperature, and electricity consumption. Further work can be consider in the field of estimation of neu-ral network interval forecast while risk managements may be more interested in predicting intervals for future price movements than simply point estimates. Finally, wavelet analysis, which is very well suited to the analysis of non-stationary signals, combined with neural networks, can be used to analyze, decompose and synthesize the electricity price.

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4. *Update the weights frequently according to the testing results*
5. *These data are demand weighted averages of locational marginal prices.*
6. *http://www.pjm.com*
7. *Pao (2007) employing a rolling cross validation scheme using neural networks for electricity prices at the European Energy Exchange for the period 2002 – 2005.*

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Zacharias Bragoudakis

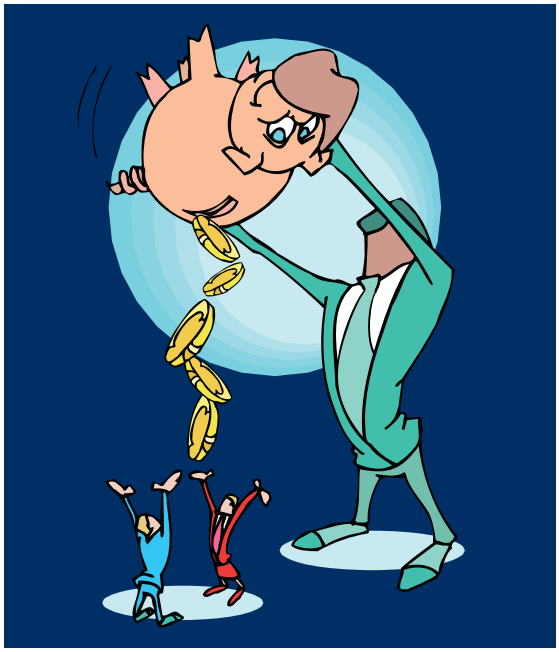
An Empirical Investigation between Public Expenditures and Economic Growth: The case of Greece

JEL classification: C15; C32; C53; E0 ; E6
Keywords: Cointegration; Vector error –correction models

Abstract
The efficiency of public expenditures to influence effectively the level of national income is disputed in two fields: First, in terms of the nature of causality: According to the Wagner's hypothesis, national income is what influences public expenditures mainly through the increase of demand for public services (Ram, 1987). Second, in terms of the effectiveness of public expenditures on the level of national income: According to the neo-classical theory, in the long-term, public expenditures do not have an important effect on the increase of national product.
The main purpose of this paper is to empirically investigate the existence and the nature of the long-run relationship between public expenses and economic growth in the Greek economy. The econometric results provide evidence for the twofold: a) the existence of a positive long-run relationship between gross domestic income and productive public expenditure in Greek economy b) evidence that the two variables are not weakly exogenous.

1. INTRODUCTION

Regarding the relationship of interaction between public expenses and economic growth two main and counterbalancing approaches exist in terms of economic causality: The first approach, known as "The Keynesian Doctrine", supports that governmental expenses constitute an important economic tool so as to ensure a desirable level of economic activity, rectify short-term cyclical fluctuations and ensure a rate of increase of public investments that would lead to the optimal level of growth and development (Singh and Sahni (1984), Ram (1986)). The second approach supports that an overwhelming governmental intervention in economic life negatively affects economic growth through two main channels: First, it decreases the total productivity of economic system due to the lower effectiveness observed in the public sector. Second, it decreases the invest-



ment motives and does not lead to the optimal economic decisions due to high tax rates (Barro (1991) and King and Rebelo (1990)).
The efficiency of public expenditures to influence effectively the level of national income is disputed in two fields: First, in terms of the nature of causality: According to the Wagner's hypothesis, national income is what influences public expenditures mainly through the increase of demand for public services (Ram, 1987). Second, in terms of the effectiveness of public expenditures on the level of national income: According to the neo-classical theory, in the long-term, public expenditures do not have an important effect on the increase of national product.
Nelson and Singh (1994), Lin (1994), Rebelo (1993), Ram (1986a, 1989), concluded that public expenditures have a positive effect on national income while on the contrary, Engen and Skinner (1991), Barro (1990,1991), Barth and Brady (1987), Grier and Tullock (1987), and Landrau (1986) support the negative effect of public expenditures in national income. Regarding the direction of causal relationship Courakis et al. (1993), Georgakopoulos (1992), Abizadeh and Gray (1985), Ram (1986b, 1987) consider that public expenditures are those influencing gross domestic product (GDP), while Arghyrou (2000) supports that causality runs both ways.
In the case of the Greek economy, Arghyrou (1998, 2000), Ghletsos (1997), Ghletsos and Kollias (1997), Georgakopoulos and Loizides (1994), support that public expenditures helped in the increase of national income. However, Dalamagas (1995), Economou (1992) and Provopoulos (1982) have a different viewpoint. Regarding the direction of the causal relationship, Georgakopoulos and Loizides (1994) and Ghletsos and Kollias (1997), consider that public expenditure causes GDP, while Provopoulos (1981), Bacon and

According to the neo-classical theory, in the long-term, public expenditures do not have an important effect on the increase of national product.

Karayiannis (1980) support that changes in GDP are actually those leading public expenditure.
The rest of the paper is organised as follows: Section 2, outlines the econometric methodology and the data on which our empirical analysis is based and discusses the estimated results. Finally, section 3 summarizes the findings and presents the conclusions.

2. Econometric Methodology and Data

As productive public expenditure (GCP) we consider the sum of consumer expenditure (GC) and gross investments of fixed capital (GI), that is to say GCP = GC + GI.
We calculated the real prices of GDP and productive public expenditure by dividing their nominal values with the consumer price index (CPI). The sample covers the period 1960-1999 and the data are annual time series that come from the long-term statistical data base of the Greek Ministry of National Economy.
The econometric methodology used includes the following steps: First, we examine the rank of integration for the series log (GDP), log (GCP) using the Augmented Dickey-Fuller (1981) unit root tests. Second, an unrestricted VAR is estimated using the Johansen's cointegration technique (1988, 1991, and 1992), which is known to be "sensitive" to the number of time lags (Banerjee et.al., 1993). For determining the appropriate number of time lags of VAR the following criteria were employed: Akaike Information Criterion (AIC), Schwartz Bayesian Criterion (SBC), Hannan-Quinn Information Criterion (HQ) and a likelihood ratio criterion known as Sim's Test.
Third, we follow the Pantula principle (1989) in order to decide whether or not, deterministic components (time trend and constant term) will be included in the short and long-run model. Fourth, the existence of a long-run relationship between GDP and GCP is examined via a VECM. If such a relation indeed is in effect, the model is augmented with the proper number of time lags of the endogenous variables GDP and GCP in first differences as well as with other variables proposed by the economic theory so as to capture the short-term dynamic of the variables in the system. Finally, a test for weak exogene-

Table 1 : Augmented Dickey –Fuller Test Results

1ADF Statistics	Levels Log(GDP)	First Differences ΔLog(GDP)	Level Log(GCP)	First Differences ΔLog(GCP)
Φ_2	0.13(0)	7.38*(0)	0.35(0)	7.32*(0)
t_a	-2.26(0)	-5.47*(0)	-1.43(0)	-5.96*(0)
t^*_a	-1.53(0)	-4.46*(0)	-0.85(0)	-5.00*(0)

1. Φ_2 is the ADF test for $(\alpha, \delta, \gamma) = (\mu, 0, 0)$ in the regression $\Delta x_t = \alpha + \gamma t + \delta x_{t-1} + \sum_{i=1} \zeta_i \Delta x_{t-i} + u_t$, and the critical values being given in Dickey and Fuller (1981) (p. 1062). t_α is the ADF unit root rest for $\delta=0$ its critical values being provided by MacKinnon (1991). t^*_α is the ADF test for $\delta=0$ when the trend is omitted from the regression. Figures in parentheses denote the number of lagged dependent variables in the regression. The selection of lags is based on the LM tests for first and fourth order autocorrelation of the residuals and on the significance of ζ_i.

ity is executed with an intention to investigate the direction of causality as proposed by Granger (1988, 1995).

3. Empirical Results

The hypothesis of a unit root in the logarithmic levels of GDP and GCP cannot be rejected. By contrast, the hypothesis of a unit root in the first differences is rejected in all cases in favour of the alternative of stationarity. These results suggest that both series are I(1) (Table 1).

The criteria AIC, SBC, HQ, and Sim's Test indicates that the optimal number of lag included in the VAR is k=1 (Table2).The determination of proper restrictions for the constant term and time trend in the short and long-run model is performed by following

Table 2: Test Statistics and Choice Criteria for Selecting the Order of the VAR

Lag	LogL	LR	AIC	SC	HQ
0	27.325	NA	-1.368	-1.281	-1.338
1	130.415	189.463*	-6.725*	-6.463*	-6.633*
2	132.586	3.75548	-6.626	-6.190	-6.472
3	135.558	4.81989	-6.570	-5.961	-6.355

*Indicates the appropriate lag length.
LR: sequential modified LR test statistic (each test at 5% level) [Sims' Test]. AIC: Akaike information criterion (1973).SC: Schwarz information criterion (1978).HQ: Hannan-Quinn information criterion (1978).

Pantula principle (1989) ((see Johansen (1992) and Harris (1997)). We estimate three alternative models and moving through from the most restrictive to the least restrictive model comparing each time the trace and maximal eigenvalue test statistic to its critical values and stop by choosing the most appropriate model, only when the null hypothesis is not rejected for the first time.

The results indicate that the most appropriate model is model 2, which allow only for constant term in the cointegration relationship but not for linear trends in the logarithmic levels

Table 3: Joint Tests for Deterministic Components and Cointegrating Rank

	H_0	H_1	r	n-r	95% CV Model -2	Model -2	Model -3	Model -4
LR Stat.	r=0	r=1	0	2	15.67	20.02**	12.38	13.36
λ max test	r≤1	r=2	1	1	9.24	7.18*	7.14	7.19
Trace Stat.	r=0	r=1	0	2	19.96	27.20**	19.47	20.56
λ trace test	r≤1	r=2	1	1	9.24	7.18*	7.14	7.19
Standardized beta eigenvectors						Log(GDP)	Log(GCP)	Constant
						1	-0.94	-1.84
						-1.05	1	1.94

*Indicates the first time where the null hypothesis is not rejected. Model-2, allows only for intercept in the cointegrating relations and not for trends. Model-3, allows for linear trends in the logarithmic levels of the variables. Model-4, allows for linear trends in the cointegrating relations. The critical values are from Osterwald –Lenum (1992).
**Denote rejection of the null hypothesis for the 5% significance level.

of the variables. We conclude that a positive long-run cointegration relation exists between public expenditures and the gross domestic product (Table 3).
Having verified that the variables are cointegrated, VECM can be applied. The results and the diagnostic tests of the VECM are presented in Table 4. The equations of the system reveal good fitness and the system passes all diagnostic $\chi 2$ tests for the hypotheses that there is no serial correlation ;that the residual follow the normal distribution; that there is no Heteroscedasticity; and finally that there is no autoregressive conditional Heteroscedasticity. In both equations of the VECM it is indicated that the residuals are Gaussian as the Johansen method presupposes.
The dummy variable D74, refers to 1974, during which, on the one hand the Greek economy returned to a state of democratic governance, and, on the other, the effects of petroleum

A crocodile “eating the heart” of the public financial system
Painting by Iraklis Avtitis, 9 year old

Table 4 : Results from the VECM and Diagnostic Tests

Cointegrating Relation		
Log(GCP(-1))	1.00	
Log(GDP(-1))	-1.053	[-16.629]*
C	1.948	[5.433]*

Error Correction Terms:	Δ(Log(GCP))		Δ(Log(GDP))	
	-0.306	[-5.128]*	-0.180	[-4.486]*
Δ(Log(GCP(-1)))	0.001	[0.010]	0.181	[1.672]
Δ(Log(GDP(-1)))	-0.100	[-0.450]	0.068	[0.453]
D74	-0.087	[-1.626]	-0.191	[-5.275]*
Adj. R-squared	0.311		0.568	
S.E. equation	0.049		0.033	
F-statistic	6.577		17.270	

Diagnostic Test for System Misspecification	
χ^2*Autocorrelation(4)*	1.654
χ^2*Normality(2)*	1.724
χ^2*Heteroscedasticity(1)*	1.243
χ^2*Arch(4)*	1.44

* Denote rejection of the null hypothesis for the 5% significance level. t- Statistics in brackets.

crisis influenced it intensely. This dummy introduction as unrestricted variable helped the improvement of the system getting well-normalized residuals.

Further to the above, for the pair of Log (GDP) and Log (GCP) variables we examine the existence of long-run weak exogeneity by performing the LR tests (Johansen and Juselious (1992)).

Table 5: Weak Exogeneity Test

Ho: a1 =0 (Log(GDP) Weakly exogenous	Ho: a2 =0 (Log(GCP) Weakly exogenous
x2(1)=12.8 *	x2(1)=16.21*

* Denote rejection of the null hypothesis for the 5% significance level.

That is, to evaluate whether the terms of the speed of adjustment to the long-run equilibrium included in the VECM is statistically insignificant (Table 5).
The LR statistical test indicates that none of the two variables is weakly exogenous in the system. That is, two-direction causality exists between gross domestic product and productive public expenditure. The standardized cointegrating beta eigenvectors of the system χ_{1t}' = [Log(GDP) Log(GCP) C] and χ_{2t}' = [Log(GDP) Log(GCP) C] have been estimated as a_1' = [- 1.05 1 1.94] and a_2' = [1 -0.94 1.94] respectively, implying that a percentage increase of 1% of gross domestic product causes , in the long-run, an increase of productive public expenditure of 1.05%, while an increase of 1% of public expenditures results to an increase of gross domestic product of 0.94%.

4. SUMMARY and CONCLUSION

In this paper we investigate the existence and the nature of the relationship between public expenses and economic growth in the Greek economy. The econometric results provide evidence for the twofold: a) the existence of a positive long-run relationship between gross domestic income and productive public expenditure in Greek economy b) evidence that the two variables are not weakly exogenous in the system. Consequently, it is supported that a causality of two-directions exists supporting previous results of Arghyrou (2000).

The opinions and analysis presented in the paper are those of the author and do not necessarily reflect those of its respective institutions.

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Interview

Large shareholders under pressure by Activist Shareholders!

An Interview of Maria Nikolakaki, CEO of NOVUS FINANCE

Following the developments of 1999-2001, a new order has emerged both in the global financial market scene and in the Greek market. New rules are introduced to heal the wounds of the past and also to **set the foundations of new practices and institutions.**

Transparency, quantitative and qualitative information and of course the reassurance of value creation for minority shareholders constitute a common factor! The leading roles for the change are being played by the minority shareholders themselves, as mentioned by Ms. Maria Nikolakaki(*), chief executive officer of NOVUS, a company specializing in Investor Relations that includes major Greek listed companies in its clientele.

Therefore, they "ought" to be informed about foreign trends and also the signs for their entrance in the Greek market.

The so called activist shareholders are demanding in a way the status of the co-owner next to large shareholders-management.

Examples of shareholders activism increase each day, especially in foreign markets (Vodafone). In the Greek reality we are still at the beginning, however the first signs seem to be quite strong.

The extreme liquidity recorded internationally entails larger inflow of capital in equity and increased demand for strategic participation. This fact, along with the lack of trust towards company management, implies increased pressure from shareholders towards owners-managers, an issue that Greek listed businessmen can hardly ignore anymore.

Q: Shareholder activism is indeed a global phenomenon, which is constantly increasing. In the Greek market, what are the basic reasons the "movement" has been set in operation?

A: First of all, we should highlight that the Greek examples of shareholder activism are found in foreign institutional investors, who have internal audit departments for their investments regarding Corporate Governance. A series of factors (qualitative metrics) rate their companies-investments and define their "demands" reassuring value creation. In the case such factors are not met, the manager that realized the investment is committed to proceed with the necessary decisions (i.e. liquidation, reduction of position) irrespective of the return recorded in his/her portfolio.
Shareholder activism from foreign investors is expected and inevitable in the Greek market. The basic reason being that most companies and especially those with middle and small capitalization (according to international standards), are managed by large shareholders-founders, usually of second generation. Therefore, the composition of the board of directors and management in many cases doesn't meet the Corporate Governance criteria set by foreign investors.
Of course, the Greek market is not the exception of the "family based" regime in listed companies. It is a phenomenon present in almost all Mediterranean markets and is related to cultural and sociological issues.

Q: Do you believe it is possible to change the mentality and that large shareholders-owners-management will accede to the demands of shareholder activists?

A: It is quite difficult, but bound to happen nevertheless. The participation of foreign institutional investors amounts to 50.23% of the Athens Exchange's capitalization, according to the latest statistics by the Central Securities Depositary. Moreover, from the data itself it is obvious that in many cases foreign investors own more than 20% of a company and most of them have a position of over 5%. In any case, there is a "coalition" of foreign institutional small investors to put pressure on companies. Apart from the statistics that underline the situation, there are also the following important reasons:

(1) Foreign institutional investors are one of the most significant sources for raising capital, therefore there is major dependency of listed companies on such.
(2) The convergence of operation and monitoring regulations of the EU capital markets emphasizes the need for Corporate Governance and Transparency.
(3) The competition to attract capital has gradually developed to the sector level. As a result, Greek listed companies are compared and evaluated against relevant companies internationally.
(4) Increased problems of "emotional" management.
(5) Increased number of quality and management know-how

executives.
(6) Intense surge of mergers and acquisitions led by foreign houses. The continuous emergence of private equity should also be noted.

Consequently, for a company to become attractive investment-wise within the global capital market, adjustment to the new order is imperative.

Q: Can you give us an example of shareholder activism?

A: The simplest example is the board of directors' composition. In this case we have a "veto" by foreign institutional investors to change its composition. In some cases the "pressure" may lead to resignation of the management. Another example is the participation in the decision making process, such as return of capital to shareholders and dividends, acquisitions and the company's broader strategy.

Q: Are there benefits for large shareholders-management?

A: The issues raised by foreign shareholder activities aim most of the time at the medium to long-term reassurance of their investments within an intensely competitive environment of returns. In most cases they urge for globalization of the company and acceptance that the creation of value added is fair for all shareholders. Therefore, the benefits for large shareholders-management are as follows:

- Segregation of ownership-management with possible significant benefits for themselves and all stakeholders.

- Increased self-discipline and better corporate organization with long-term benefits for the company.

- Transparency and culture with a global scent that contributes to reinforcement of the company's investment brand and shareholding structure.

- Strategic alliances with significant benefits for the company's strategic development.

This interview first appeared in www.euro2day.gr on 20 July 2007.

(*) Ms. Nikolakaki holds a Bsc degree in Economics and a Msc in Economic Theory from the University of Essex and a MPhil/PhD in Applied Econometrics. Amongst others, she has worked at Bear Sterns, Telesis Securities, MFK Renaissance Capital in Moscow and at EBRD in London.

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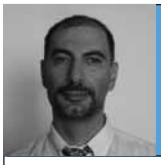

Panagiotis D. Tyranis

Food for (Economic) Thought

History has taught us that too much of a good thing is equally a wise than excesses in a bad habit. The FED has frequently relied on decreasing the cost of capital through numerous successive rate cuts. In recent memory one can remember the dot.com bubble, the extremely low rates of 1.25% of 2002-3 and their consequence… the Housing Bubble. Unfortunately the Fed has not learnt from its previous mistakes. It has one cure for all malaises; it intends to bail out every Bear Stearns with multi billion cash injections. Instead of the Invisible Hand of the Free Economy we get the visible actions of the Feds, allowing ailing companies that have over extended credit with little or no afterthought (they would pass their loan portfolios to other Institutions in Wall or Main Street) to compete unevenly with unsubsidized companies. Hence we solve the current problem of the slumping Housing Market, the Monolines, the Insurers, the Funds, the Banks, and the Consumer etc. by throwing everything at them but the kitchen sink. Possibly creating an even larger problem in the Economies in the future. Some economist consider the solutions worse than the problem that originated those responses, others question whether the Tax Rebates will lead to superior

Consumer Confidence levels, with consumption resurging or that this windfall cash will be stashed away to repay credit cards or delinquent loans. And though Inter-bank lending rates have been reduced there is no evidence to suggest that Banks are currently more prone to lend each other. During the last credit crises a decade ago ('98) European Banks were leveraged approximately 26 to 1, currently the leverage has been geared to 40 to 1. Therefore windfall cash infusions or rate cuts are more likely to be held within and not passed on (to create a cushion of fat) to withstand further turbulence ahead. The Bloodbath in

the Credit Markets is far from over… we are currently witnessing an increased aversion of risk and leverage. As the most leveraged paper is falling in value, less leveraged paper that could be investor grade is deteriorating in value because its holders might be leveraged investors who in order to fulfill margin requirements or strapped for cash by redemptions push the papers value ever lower. Corporate paper might be next; raising cash for private placements by Venture capital firms will be harder/more expensive as required risk premiums escalade. The last generations required returns for the S&P of nearly 20% per annum something that might be exceedingly difficult to realize as inflation and capital cost erodes profit margins. Spreading of inflationary pressures eat up significant portions of disposable income, this coupled with ever more debt being assumed by Public and Private sectors will probably lead to the Worlds engine, the US Consumer to a standstill. With nearly 80% of the US GDP relying on consumption and about 65% of World GDP on the US, there is little room for error. Stagflation could lead to Recession and then what will drive us through the tough times ahead. In my opinion the entire handling of the current Housing problem was erroneous along with the Iraq war to spur the economy in 2003. The same funds used directly on municipal or state level (The Great Dig of Boston is a prime example) could give a shot in the arm to the ailing economy with less casualties (now over 4000) and less engagement (50 years in S Korea) and post dated checks that will spring up in the next generation along with Medicare… Engaging in a war is 'cheap' (under $1 trillion) but getting out of "possessed" territories takes three times as much time, money and lives! The latest bubble was fueled by near zero percent funds from Japan and Gulf states, the excessive borrowing from the US led to the deterioration of the dollars value that led to hedging toward commodities both hard and soft and other currencies. The Great Unwinding is approaching swiftly!!!
Beware.

The Bloodbath in the Credit Markets is far from over... we are currently witnessing an increased aversion of risk and leverage.

Author
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Greek Toys & Games Market Historic Trends & Prospects

April 2008

Introduction

The toys and games market in Greece continued to expand in 2007 with its growth relying heavily on the strong performance of video games software and hardware. Demand for video games is steadily increasing as children and young consumers are becoming more familiar with the use of such devices but also because video games are more adjusted to contemporary children entertainment needs. Sales of traditional toys and games, while still representing the largest segment of this market, are stagnating or slowly growing, as the market is turning towards cheaper products and video games.

Imported unbranded toys and games challenge the market

Penetration of unbranded toys and cheap imitations is one of the most distinguished trends in the Greek toys and games market. It is estimated that imported no-name toys and copies/imitations represent less than half of the total market's sales. Especially with regard to the traditional toys and games market, the trend is one of the major factors behind poor growth in value sales, as toys and imitations -mainly imported from Asia (China, etc.)- are significantly cheaper than the originals.

The Major Players

In the traditional toys and games sector, the Greek-owned AS Company SA broke the dominance of the two leading international players, Mattel and Hasbro and now ranks second in market share behind Mattel. In video games, Sony continues to be the undisputed leader of both hardware and software segments. Nintendo and Microsoft are the only followers in video games hardware. In the video games software segment, though, a number of software-specialized international companies, such as Electronic Arts are making an impact claiming higher market shares.
The domestic toy market is mainly import and trade oriented, since high labor costs have been curbing and in some cases shutting down domestic manufacturing activity for years now.

Major Players in the Greek Wholesale Toy Market
Mattel SA
Hasbro Sa
AS Company

Distribution controlled by toy specialists with durable good retailers making their presence stronger

For the past ten years, the Greek retail sector has undergone an intense consolidation phase with large retailers growing to the expense of smaller stores, neighborhood shops, and bookstores selling a small range of toys. At the same time a great number of those small players have been gradually forced out of the market.

Toy specialists are the major distribution channel as far as traditional toys and games are concerned. It is interesting though to note that the number of toy retailers is contracting and the field is consolidating to a small number of big retailer chains, such as Jumbo SA and Moustakas SA, controlling most of the toys and games market. This development is attributed to the fact that these chains import products themselves and therefore more profitably but also to their ability to expand their product range to other children-related items and attract more clientele. Greek toy specialists expand through privatively owned networks of stores or via franchising agreements targeting the largest possible number of selling points that will increase their purchasing power and justify the creation of a competitive brand name in the Greek toy retail market.

On the other hand, the smaller stores that comprise the local competition (with combined market share of <40%) are not in a position to challenge large toy retailers' attractively priced product range, wide product variety, extensive store network, and financial strength. In general, medium or small size competitors are faced with barriers in terms of finding new store locations in prime areas or competing on price as opposed to established retailers that enjoy significant economies of scale.

Jumbo is the leader of the Greek Toy Retail Market. The Company is active in the retail and wholesale trade of toys, baby products and school supplies. Jumbo controls a leading market share of 33% in Greece and Cyprus, targeting to increase to 38%. Jumbo currently operates 38 stores in Greece.

Durable goods retailers, such as Electroniki Athinon, Multirama, Germanos and Expert, are also of increasing significance because video games -unlike traditional toys and games- are extensively distributed through this channel. The ever increasing share of video games and the recent entrance of huge specialized international electronics stores, such as Media Markt and Dixons in the Greek market is an indicator that durable goods retailers will become key players in toys and games distribution.Seasonality in Sales

The domestic toys market is highly

Toy Specialists in the Greek Retail Market
Jumbo
Kou-Kou
Moustaks-Comfuzio
Zaharias
Toys Academy Pantazopoulos

seasonal with 50% of total sales generated during Christmas (30%), Easter (10%) and school opening (10%).

Market Size & Growth Trends
The following table presents the market size of the broader toy market in 2007, including the sales of related products such as stationery and seasonal home & mother opportunity products.

Major Durable Goods Retailers in Greece
Media MArkt
Dixons – Kotsovolos
Electroniki Athinon
Multirama
Germanos
Expert
Plaisio

Children's toys - Stable growth
The domestic toys market is estimated at €290m (source: company, ICAP). Children under 14 years of age account for 1.5m based on the latest demographic data sources. According to market estimates monthly consumption per customer amount to € 15. The EU toy market is estimated approximately at €18.5bn. Consumers' disposable income is the major driver behind the growth seen in this market segment with video games arising as the most notable performer.

Market Sizes		
	Total Market (€ mn)	Growth Trend
Children Toys	290	Stable Growth
Baby Products	213	Slow Growth
Stationery	156	High Growth
Seasonal Home & Mother Opportunity	656	High Growth
Total	1,315	Growth Trend

Baby Products
Several years ago, Greek toy retailers added baby products to their portfolio in an effort to diversify as well as enrich their product mix. This market segment continues to demonstrate a solid base of sales however with a slow growth potential. The domestic baby products market is estimated at €213m. Children under five years of age account for 0.5m based on the latest demographic data sources with the number of newborns stable at 100,000 per annum. It is interesting to note that spending on newborns now

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derives from first-time parents that tend to be older and possess higher disposable income. The EU baby care products market is estimated at approximately €3.6bn (source: Euromonitor).

Stationery Products – Books
This market accounts for over €150 million and concerns children under 14 year old. According to market participants, this market segment demonstrates a high growth potential.

Seasonal Home & Mother Opportunity
This is the largest market segment –estimated at €656m- that is currently linked to the Greek broader toy retail market. Attractively priced value-for-money imported products dominate this market with demand driven by disposable income trends and availability of products. The targeted population is the 15-84 of age consumer category that currently numbers 7.5m based on the latest demographic data sources.

The Greek Toy Market's Prospects
Video games are expected to continue driving the market's growth in the coming years, boosted by new technologies and systems and perhaps better value-for-money. Furthermore, their performance should be at the expense of traditional toys and games, but there are still some traditional market segments that will experience an increase in sales.
Greek toy retail specialists are expected to further increase exposure to the fast growing and highly profitable non-toy product lines including stationery and mother care products. This strategy benefits these retailers by also reducing seasonality effects on their revenues and cash flows. Positive catalysts for Greek toy specialists will be: extensive variety of products, low price offerings with satisfactory quality, well dispersed network of consumer-friendly stores, and strong network brand name.

The Greek Toy Market's Risks & Investment Concerns
The Greek toy market has almost reached maturity, with declining birth rates that reduce the number of children below 12 years of age.
Children customers have shifted away from traditional toys towards electronic games and computers (Gameboy, Playstation). This is the age compression effect since today children from younger age have easy access to video and computer games as well as to other product ranges such as mobile phones.
Intense competition exists in other product categories (baby products, stationery and books, seasonal mother products) widely available to consumers in other general or specialized retail chains or stores.

Sources: SEVPPA (Greek Toy Manufacturers Association), Equity research surveys, Greece's National Statistics Services, international organizations, Euromonitor International.

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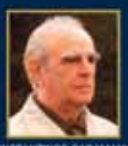
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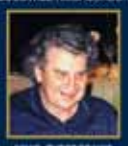
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