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THE MANAGEMENT OF GREEK SOVEREIGN RISK

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1.Introduction

In 2010 the excessive public spending produced the first sovereign bond market crisis in Europe: Greece. The Hellenic crisis is the product of years of recession, of the sluggish economic environment and poor productivity – but above all it is the product of the mismanagement of the public finance, of unsatisfactory reporting, risk management and accounting practices. Information about Greece is scarce and fragmented, but the inability by European authorities to understand the incredible mismanagement strongly disappoints the taxpayer. The relevant exposure of European banks in the bond market toward the default risk of Greece supports the need for hedging tools, such as Credit Default Swaps. However, there is evidence that the CDS market on Greek sovereign bonds is segmented, and contracts are mis-priced. The lack of comprehensive data on CDS and other OTC contracts impedes any further investigation. European authorities should consider revising CDSs trading rules and requirements, until the risks produced are properly limited.

Key words: Greek crisis, Credit Default Swap, sovereign risk management.

JEL Classification numbers: G2, H3, H6.

2.Greek sovereign debt crisis

After the subprime credit crisis of 2007, the world is no longer what we thought. An unprecedented crisis of confidence was combined with a credit crunch, and the G20 countries had to enact massive public spending programmes to save the economy and at least buffer the inevitable hard landing. American and European taxpayer paid most of the cost of the crisis, and moral hazard has not been yet eliminated. Excessive public spending boosted sovereign debt and financial markets became suspicious with weak countries. Greece reported that in 2009 it had run an unprecedented deficit of 15.4 per cent of GDP, and that its public debt had skyrocketed to 126.8 per cent. The Greek crisis is the product of years of recession, of the sluggish economic environment and poor productivity – but above all it is the product of the mismanagement of the public finances and of unsatisfactory reporting and accounting practices.

Tab. 1 Greek Government Deficit/Surplus and Debt Levels

Year	2006	2007	2008	2009
Net borrowing (-)/ net lending (+) as % of GDP	-5.7%	-6.4%	-9.4%	-15.4%
General government consolidated gross debt as % of GDP	106.1%	105.0%	110.3%	126.8%

Source: Hellenic Statistical Authority/Eurostat, UniCredit Research, November 2010.

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Greece entered the European Monetary Union in 2003, but deliberately carried out a series of financial operations that were not properly reported. Aim of these operations was to match European budget criteria. A comprehensive EU report on this issue (EU, 2010) uses harsh terms to describe the conduct of the Greek authorities: “deliberate misreporting”, “methodological problems,” “unsatisfactory technical procedures in the Greek statistical institute”, “inappropriate governance”, “poor cooperation and lack of clear responsibilities”. The EU notes that “the most recent revisions are an illustration of the lack of quality of Greek fiscal statistics ... and show that the progress in the compilation of fiscal statistics in the country, and the intense scrutiny by Eurostat since 2004, have not sufficed to bring the quality of Greek fiscal data to the level reached by other EU Member States”. It goes on to admit that “Eurostat is at present not in a position to validate figures, which are of acceptable statistical quality.” Since 2000 the Commission has revised the official Greek data repeatedly, most severely in 2004 and 2009. The defeat is hard to manage in Brussels.

In 2000-02 Greece entered into currency and interest rate swaps with Goldman Sachs to hedge risks and reduce the cost of sovereign debt. At the time these transactions were compliant with European accounting rules (which were substantially non-existent). Goldman Sachs reports in February 2010 that those transactions produced a debt reduction of € 2.367 billion. However, Goldman Sachs has not signed any other derivative contract with Greece since 2004, in accordance with Eurostat rules. The cost reduction has been produced by the effective currency hedge (of the drachma with the dollar and the yen), and by the interest rate hedge. Greece closed out its swap deals after 2002, but misreported the remaining streams of interest; in the 2005 and 2008 revisions the effects were incorporated and the data revised retroactively. According to the EU, this was a case of deliberate misreporting.

Piga (2001) investigated the use of interest and exchange rate swaps by European states prior to monetary union, concluding that some countries used these instruments not only to hedge and reduce public debt risks but also as window-dressing – shifting interest payments forward in order to reduce deficit and debt ratios, and then qualify for membership in the Monetary Union. Greece is part of this group, as is Italy. The key point, however, is that the Greece window-dressing continued even after adoption of the single currency.

In 2004 and 2005, with the application of new Eurostat rules, swaps contracts were closed out; the resulting costs or gains were counted towards the fiscal outturn in these years. Terminating the contracts before scheduled maturity meant amortizing the costs over a shorter period, and the reduction in the cost of the debt was wiped out (as it was not realized). As a result the net present value turned negative, aggravating the deficit in 2004 and 2005. But Greece did not record these events properly in the accounts². The EU revised Greek data, sharply raising debt and deficit ratios.

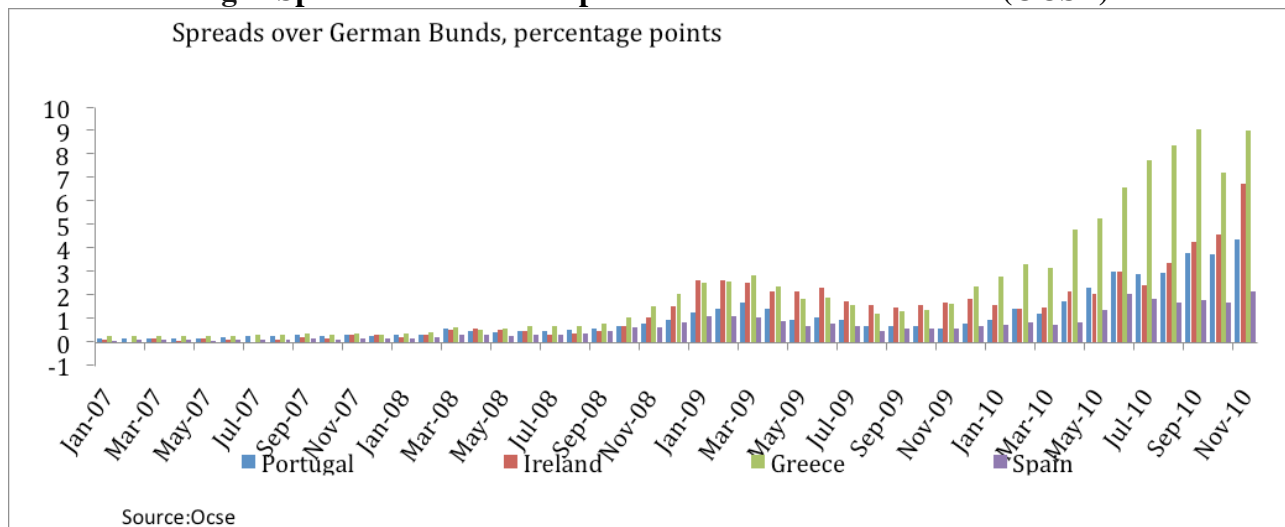
According to the EU report and the press,³ Greece continued to enter into swaps after 2005 but not directly. That is, it acted through other institutions, as the EU report describes in detail. The Greek government financed the deficit through the National Bank of Greece (a commercial bank), violating the Maastricht rules. In 2008 the National Bank of Greece accessed European Central Bank refinancing, posting as collateral notes issued by Titlos Plc. Titlos Plc is a Special Purpose Vehicle – created by the National Bank of Greece itself together with Goldman Sachs – that sold € 5.1 billion worth of notes maturing in February 2039 to the National Bank of Greece. But the Greek Treasury wholly owns the National Bank, so this would appear to be a way of financing the debt but circumventing controls and prohibitions. The end result is that the Treasury’s deficit was securitized through the National Bank of Greece, which gets liquidity from the ECB thanks to the Titlos notes. The final cost of the Greek debt is thus the ECB’s main refinancing rate. These operations represent a fraudulent violation of European accounting rules, in that they do not reflect the greater risk of the

²EU report (2010), p. 22.

³Wall Street Journal, 23 February 2010.

Greek sovereign debt (as measured by its spread with respect to German Bunds).

Fig. 1 Spreads of weak European countries' bonds 2007-10 (OCSE)



3. The Greek rescue plan of 2010-11

In December 2009 the European Central Bank published a legal-studies working paper entitled “Withdrawal and expulsion from the EU and EMU.” Apart from the publication’s timing, which is hard to see as merely coincidental, the conclusion is that the extreme solution (expulsion) cannot be precluded; it is just very complicated, now that the Lisbon Treaty has been adopted and a very large majority would be required. An easier solution would be voluntary withdrawal from the EU, which would certainly be less expensive for all concerned. A member state’s withdrawal from the EMU would certainly have an adverse impact on the credibility of the monetary union itself, but it would also strengthen the constraints for those that remain. The balance between pros and cons is not merely economic, of course, and the final decision has already been taken. The Ecofin Council has moved to save Greece.

The Greek crisis exploded in January 2010, and the Hellenic government was forced to undertake a severe austerity plan. According to official releases, the deficit will be reduced by spending reduction (sharp cuts in civil servants’ pay and benefits), pension reform (whose effects will be realized over a decade) and tax increases (VAT from 19 per cent to 21 per cent, and the elimination of many tax deductions and exemptions). The austerity plan projects the public debt going down to 100 per cent of GDP by 2020. The European Financial Stability Fund will stabilize liquidity. The parliamentary elections of October 2010 returned the majority of Prime Minister George Papandreou (Pasok party), thereby confirming popular backing for his draconian austerity plan. The spending cuts are combined with reduced public hiring, at the expense of the younger generations. The public sector overhaul provokes social and political conflict, fuels disorder and decreases the likelihood of success.

The most complicated aspects of the plan is slimming Greece’s bloated public sector and eliminating massive tax evasion (especially of VAT). These two problems cannot be solved by spending cuts alone. Organizational overhaul is needed. The Hellenic state currently hires almost 40% of working population, creating distortions in the pricing and equilibrium of the labour market.

In March 2010 Greece asked for the help of the EU and the IMF. After prolonged discussion, a 3-year rescue plan worth €110 billion was agreed on.

4. Who owns Greek bonds and risk?

According to BIS data referring to September 2010, German and French banks held respectively US\$ 40.3 and US\$ 59.4 billion of Greek debts (sovereign, corporate and private), and US\$ 108 billion is held by the ECB; the first figure refers to the public and private wealth (i.e.

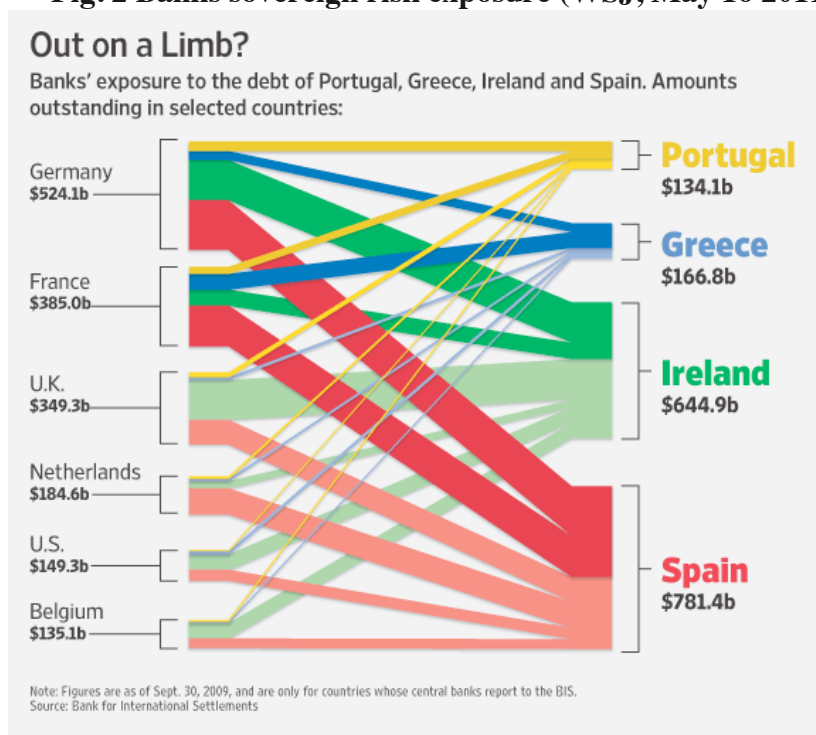
sovereign bonds, shares, and other private liabilities), while the second is the product of the Ecofin rescue plan (i.e. sovereign bonds). American and British banks have a smaller exposure.

The moral hazard in this crisis is relevant; the banking industry is exposed toward the sovereign risk, and the rescue plan has positively influenced their risk exposure. The sustainability of the rescue plan is of central importance to avoid a new banking crisis.

The rating of Greek bonds fell to BB+ in 2010, and most of the Greek debt is now sold off-market, in order to avoid excessive interest payments. The yield on Greek sovereign bonds has trended upward throughout the year, and in May 2011 it has been downgraded to junk level.

In 2011 worth €22 billions Greek public bonds expire and other €33 billions in 2012, Greece cannot re-finance these amounts, and some European countries are against a new rescue plan without any collateral. According to first consultations as of May 2011, Greece will be requested to employ privatisation to directly re-finance public debt and European creditors. To avert another Russian-style crisis, the IMF and the EU make regular visits to Greece to verify the country's effective ability to implement the plan. The withdrawal from the Union cannot be still ruled out.

Fig. 2 Banks sovereign risk exposure (WSJ, May 16 2011)



5.CDS on Greek bonds: the missing link

Financial derivatives can be employed to smooth the costs of debt, and to hedge outstanding debt; this is coherent with the efficient market hypothesis that justified the weak control and monitoring on deregulated financial markets and instruments. Credit default swaps (CDS) are very popular financial contracts suitable for hedging credit risks; they traded Over The Counter (OTC), and volumes of trading increased in the recent. The information disclosed about this market is very poor; nominal volumes are monitored by the BIS (http://www.bis.org/publ/otc_hy1011.htm), but nominal values are inflated and do not reflect the effective liquidity of this market.

The BIS reports in June 2010 that US\$2.4 billion of CDS on sovereign bonds are traded (measured at their notional amount) over a total of worth US\$ 18.4 billion; nothing is known about who is holding such contracts (i.e. hedgers or not) and about the potential domino effect. The

structure of CDS contracts is such that protections sellers are exposed to sovereign default risk; sellers can be banks, insurance companies, and financial and non-financial institutions. According to BIS data, dealers trade over 50% of contracts (measured at notional amount), roughly US\$ 16 billion out of total US\$ 23 billion, while banks trade at their name just US\$ 4 billion. Non-financial institutions, hedge funds and insurance trade around 5% of the market each. Maturity is mostly between 1 and 5 years. Dealers usually trade at banks, and then we can consider that the banking system trades more than 50% of CDS; data on CDS on sovereign bonds basing on reporting institution is not provided. The distribution of counterparties and risks in the CDS market is not known, since there is no central clearing process; this “known unknown” confirms the need for further investigation.

Tab.2 Credit Default Swaps Market
Single-name instruments Notional amounts outstanding at end June 2010
 In millions of US dollars

Instrument/counterparty	Notional amounts outstanding bought	Notional amounts outstanding sold	Total
Total single-name instruments	14,486,640	14,366,151	18,379,414
Reporting dealers	10,475,547	10,471,207	10,473,377
Other financial institutions	3,804,347	3,718,929	7,523,276
Banks and security firms	2,563,877	2,421,982	4,985,859
Central counterparties	585,279	570,580	1,155,859
Insurance and financial guaranty firms	82,096	48,782	130,878
SPVs, SPCs and SPEs	84,387	91,892	176,279
Hedge funds	161,830	262,853	424,683
Other financial customers	326,879	322,839	649,718
Non-financial institutions	206,746	176,015	382,761
Maturity of one year or less	1,836,178	1,820,806	2,333,557
Maturity over 1 year and up to 5 years	9,892,247	9,854,231	12,482,355
Maturity over 5 years	2,758,213	2,691,114	3,563,500
Sovereigns	1,868,957	1,843,525	2,392,475
Non-sovereigns	12,617,689	12,522,627	15,986,947
Investment grade	10,045,975	9,950,618	12,812,872
Below investment grade	3,271,847	3,289,147	4,079,331
Non-rated	1,168,823	1,126,387	1,487,218

Source: Bank for International Settlements, May 2011.

The finance literature has investigated the CDS theoretical behaviour and contribution in financial markets; empirical investigations on CDS pricing are rare, due to scarcity of data. Ericsson et al (2009) investigated the explanatory power of variables that in theory should determine credit spreads; their results confirm that volatility, firm leverage and the riskless interest rate play a role. Nevertheless, results change dramatically if considering levels or differences, and considering different econometric methods. This confirms our suspect of mis-functioning.

The booming public debt has influenced the spread of bonds, but with asymmetric effects on the primary and the secondary markets. The primary market still enjoys reasonable prices; demand

and supply meet and demand actually overcome supply for most European countries. This happens because of excess supply of money created by central banks (European, Japanese and American). Small returns on sovereign bonds come with small risk, and risk neutral or risk adverse institutional investors like pension funds, public firms and insurance companies prefer this market basically for statutory reasons.

The so-called Quantitative Easing 2 (QE2) manoeuvre of the US Federal Reserve bought roughly US\$ 600 Billion Treasury bonds to sustain the market and the recovery process (Board of Governors, 2010-11). The European central bank is far more opaque in its action and does not disclose its assets and portfolio strategy, but inundated the market as well. The Japanese central bank is printing money for free since 1998.

On the contrary, aggressive operators with risk loving attitude populate the secondary market (hedge funds, investments banks and others); they do not enjoy the direct effects of central banks liquidity. Higher spreads of the secondary markets reflect not only the effective risk of certain debtors (like Greece), but also the high speed of adjustment of risk-lover operators, fuelling further volatility. The pricing mechanism is not working properly, and the fundamental condition of absence of arbitrage cannot be verified.

Fig. 3 Yield of Greek 10Y bonds 2010-11 (Bloomberg)



Issues that need to be clarified with respect to the role of CDS on sovereign bonds are basically: the difficulty in CDS clearing and management; the liquidity; the value of the assets underlying the swap contract.

- The CDS market is populated by unregulated operators, is OTC and then not accessible by retail customers, contracts are priced in US\$, transparency is not required. According to Shadab (2009), CDS are superior to securitization in transferring risks and the crisis has been the result not of the financial instruments themselves, but was due to their concentration outside the regulated financial system, under no compensation system. The US Federal Reserve of New York (2010) aims at introducing a centralized clearing system (i.e. electronic trading platforms) to promote efficiency; however, there will remain a population of customized contracts managed bilaterally. The EU Commission is considering the introduction of a clearing-house system for OTC derivatives trading (EU 2009-10); this would improve the settlement and pricing, but would reduce the attractiveness of OTC market, pushing for new innovations (Shadab, 2009 reached the same conclusion for the

American financial system). The alternative solution would be to introduce some forms of capital requirements. This seems to be more reasonable, although not very easy to implement. The EU antitrust commission in May 2011 started the investigation of the degree of concentration of dealers in the CDS market, in order to avoid any violation of competition rules and maintain financial stability (EU Antitrust 2011).

- What is the liquidity of the CDS market? Answering is not easy, since OTC derivatives markets are not liquid by definition, but can “substitute liquidity”. The liquidity necessary to open a position in the CDS market is far smaller than in the secondary or primary bond market, but the underlying risk is the same. The liquidity is so abundant in the primary bond market that spreads do not reflect effective risks (e.g. Greek bonds). On the contrary the spreads in the secondary market reflect both risks and lack of confidence; CDS market behaves like the secondary market that is completely absent for Greece (i.e. illiquid), markets are segmented and pricing is inefficient (since spreads on the same bond are different in the primary and secondary markets). The trading of CDS is coherent with portfolios exposed to sovereign bonds; CDS are traded to replicate the illiquid secondary market and create credit link notes⁴. With credit link notes the investor buys the same risk of bond, without investing the same amount of money; this happens under no supervision on the distribution of risks created in the CDS and CLN markets (counterparty information is undisclosed).

- If the pricing mechanism is not efficient, either contracts are mis-priced or the value of the underlying assets is not univocally defined (i.e. multiple equilibrium). I do believe in the second explanation because of market segmentation. Considering the asset swap can be the counterproof; asset swap represents the degree of confidence of investors in that class of assets. Actually the Greek situation is such that it can either default or not, there is no Chapt.11 creditor protection, and in case of bankrupt losses are 100% for creditors. Asset swap on Greek sovereign bonds confirms a high level of confidence that comes from the primary market, because the value of the underlying asset is priced considering a 0% probability of default. If Greece defaults the entire Euro area goes into a deep crisis (contagion to Ireland, Portugal and Spain) and the primary market does not price this event. The secondary market on the contrary attacks some probability to the Greek restructuring debt, since the path of public debt seems to be unsustainable. The mis-pricing between the underlying and the swap contract violates the pricing rules of derivatives.

According to these 3 fundamental issues, CDS represents a small dangerous threat to financial stability because of the opacity, the absence of a compensation system, the liquidity that is not distributed uniformly, and the mis-pricing of contracts.

6. Conclusion

Following the underestimation of the risks and repercussions of mortgage-backed securities

⁴ A credit-linked note (CLN) is a derivative which offers synthetic exposure on an [credit default swap](#) (CDS). CLN are structured securities whose principal and interest payments are contingent on the performance of specified borrower companies, or Reference Entities. They are created by embedding a Credit Default Swap (CDS) in a funded asset to form an investment whose credit risk and cash flow characteristics resemble those of a bond or loan. The difference between a CDS and CLN is that the credit-linked note is an on-balance sheet item. CLNs are primarily used for credit default swaps, but can be used as a hedge for other forms of debt. A company looking to spread its risk for a specific credit event will look to issue CLNs in order to transfer this exposure to credit investors. Special Purpose Companies (SPC) or trusts create the CLNs, which start out with a AAA credit rating and then act as a broker between the credit issuer (company) and credit investors. These notes are offered to investors as both a credit default swap (riskier investment) and the AAA bond at par value. Credit investors are willing take on this credit risk in hopes of receiving a higher yield on their investments than with typical [bonds](#). The trust or third party will then sell default protection in return for a premium that subsidizes the coupon payments to be made to the holder of the CLN. Hence the credit investor has exposure to both the CLN and the credit issuer.

and credit default swaps, the Greek crisis confirms that the world has changed with the spread of derivatives in global financial markets. Complex derivatives make transactions and balance sheets more opaque, opening up opportunities for subprime and predatory lending and the mismanagement of public debt. The GASB principles (i.e. fair value) will ensure better measurement of countries' effective risk exposure, but they will also make total balance sheet size more dependent on financial market cycles and increase the volatility of the debt.

The EU official documents make it clear that Greece did not actually violate proper accounting rules, which were not introduced until after the derivative contracts were made; but it did violate the principles and limits imposed by the European treaties, omitting relevant information. The market accordingly punished it by lowering the country's credit rating to a level that forced international institutions to intervene as lender of last resort. The expulsion or withdrawal of Greece from the Union would be politically unsustainable, which will presumably help the other peripheral EU member states with troubled finances (Portugal, Ireland and Spain) in 2011-12. The numerous revisions of the Greek public accounting data and the subsequent crisis confirm that the incentives to cheat far exceeded the potential cost, and disappoint the European taxpayer to a larger extent. The condition for the rescue plan to succeed in the medium term is that its costs (austerity plan) have not to exceed revenues (debt bail out). Most economic analyses see the solution in productivity improvements, which can speed Greek economic growth and thus ease the burden of debt. Such a structural overhaul can only come from national policy, with reforms that so far are only minimally under way.

The relevant exposure of European banks toward the default risk of Greece supports the need for hedging tools, such as CDS; the ECB, German and French banks held around US\$ 210 billion of Greek liabilities as of Sept. 2010. However, the CDS market is not efficient and is segmented. The primary bond market is populated by risk-neutral or risk-averse operators and is inundated by central banks liquidity (i.e. squeezing spreads); the secondary market is very volatile and dried (and spreads explode), and the missing link is the CDS market. The re-packaging of risks in portfolios implemented by banks is very difficult in the presence of structural weaknesses in the pricing mechanism. The moral hazard of CDS trading by the banking system is not negligible, since banks own a large amount of the underlying risk, but according to available data its magnitude cannot be evaluated. This lack of data represents a further danger to financial stability.

International financial institutions have supported the spread and use of financial derivatives, including CDS to smooth the cost of debt and/or hedge, but CDS on sovereign bonds represents a small dangerous threat to financial stability because of the opacity, the absence of a compensation system, the liquidity that is not distributed uniformly, and the mis-pricing of such contract.

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