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The EMU Crisis, Hysteresis, and the Zone of Inaction

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***Bottom line**: In this note, we propose a conceptual framework to help explain why the EMU member countries have been trapped in a 'zone of inaction', i.e., not being able to expel Greece but also not willing to move toward greater integration. The decision to build a factory usually entails an assessment of whether the expected profits could more than compensate for the fixed costs of building this factory. In an environment of uncertainty, normally the expected profits would need to substantially exceed this 'hurdle cost' for the project to go ahead. However, once the factory is built, if profits fall, the rational decision could be to continue to operate at a marginal loss, as long as the costs of shutting down the factory are significant. This time-inconsistent situation where 'the failure of an effect to reverse itself as its underlying cause is reversed'[1] is called the 'hysteresis effect.' In many ways, the EMU suffers from precisely this hysteresis effect, and is trapped in the zone of inaction: to the members, the benefits of joining the EMU a decade ago justified the membership, but the massive costs of being EMU members are not large enough yet to justify secession. (1) While the consensus view may be that Europe needs to buy time to build a firewall, the reality is that the very measures taken to buy time have significantly increased the costs of Greece or other countries leaving the EMU. Repeated bailouts, therefore, have made it costlier for any member to exit the EMU. (2) From a purely economic perspective (i.e., setting the political considerations aside), it does seem to us that the costs of secession – both to the country and to the monetary union - are lowest if Germany secedes from the EMU. There lies the irony: it would be most costly to force out the least deserving EMU member, and least costly for the most deserving member to leave the EMU. (3) The turmoil in Europe could persist for years, because of fundamental political, economic, and time inconsistencies associated with the EMU project. The costs of bailouts and*

[1] Avinash Dixit (1989) 'Entry and Exit Decisions under Uncertainty,' Journal of Political Economy. Vol 97: 3.

subsidies between the EMU countries are likely to grow significantly, possibly into trillions of euros, rather than the hundreds of billions of euros committed so far, if the experience of the former East Germany is a guide.

Playing games. The days, weeks, months, and years ahead will likely be challenging for Europe. Greece's second election and France's parliamentary election on June 17, 2012, could further complicate the political landscape in Europe. In dealing with Greece, it seems unlikely that major initiatives will be proposed or undertaken by the EMU members before these elections. Similarly, given the political nature of the tensions in Europe (Spain's reluctance to turn to the IMF/EFSF is a political decision, not an economic one), it is equally unlikely for the ECB to leapfrog the European governments in coming up with a response, as was clear from Mr Draghi's press conference yesterday.

We have a modest thought to add to the rich discourse on the situation in Greece, both before and after June 17. The matrix below shows the key game theoretical scenarios, delineated by the relative assertiveness of Germany and Greece toward each other. Specifically, the four distinct states are defined by whether Germany is 'soft' or 'hard' toward Greece, and whether Greece is 'soft' or 'hard' toward Germany.

		GERMANY	
		S	H
GREECE	S	(S, S)	(S, H)
	H	(H, S)	(H, H)

The (S, H) scenario should in theory yield the best effects on financial markets: a disciplined Germany and a compliant Greece. In fact, between the finalization of the second rescue package in March 2012 and May 6, 2012, we were in this state. The May 6 election moved us into the (H, H) state, which is unstable and unsustainable. There was a risk that Germany (and Brussels and Washington DC) might have been unnerved and elect to retreat and adopt a conciliatory stance, which might in turn embolden Mr Tsipras. However, the resulting (H, S) state would arguably generate the most market volatility over the medium-term, if the troika loses credibility in their dealings with Greece, and in turn

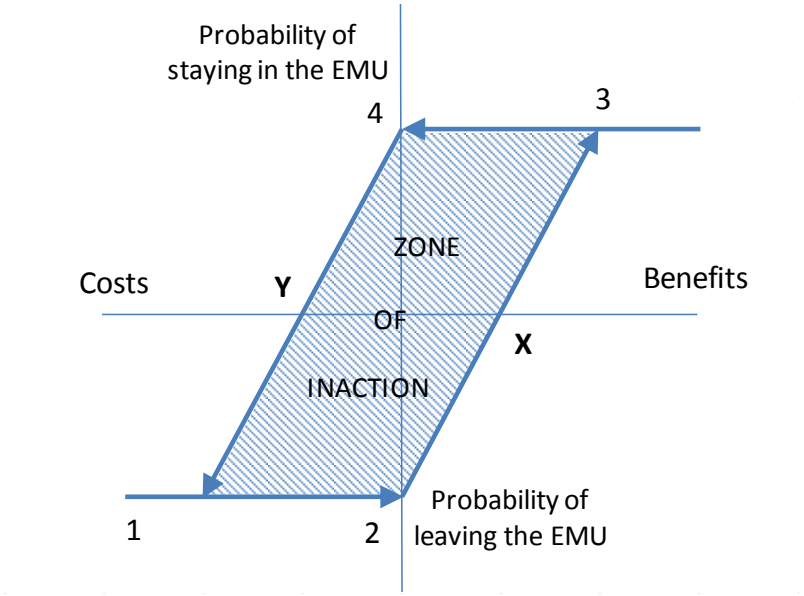
their credibility with Ireland and Portugal is eroded. Even after the election on June 17, it will be important for the market to see that the (S, H) state is regained. Fortunately, Germany's proposal of a six-point plan, to us, suggests that it is adopting a 'hard' stance, that this proposal is a rebuttal to the calls for less austerity and less structural reforms.

At the same time, a milder form of the above-mentioned game is being played with Spain.

Hysteresis. It is inconceivable for the US states to play games with each other, as Germany, Greece, and Spain are now, or for the US states to play games with the Federal government. The issue here is that the members of the EMU are *both democratic and sovereign*. In the US, the Federal government can dispatch federal marshals into the states to enforce federal laws or exact taxes. In the EMU this cannot be done. Further, in the EMU, despite the fact that there is no provision in the Treaty for this, the members can elect to stay or leave the union. So far, the perceived costs of leaving the union have been too high, but it is no longer obvious this will remain the case, for either Greece itself or the rest of the EMU.

Had the EMU members known that Greece would turn out to be like this, they most probably would not have accepted it into this supposedly exclusive club. But now that Greece is in the club, there is huge resistance to expelling it. Why is this so? In the economics literature, there is the subject of investment theory under uncertainty. When costs of reversal are high, decisions to engage in a fixed investment (e.g., building a factory) are not taken lightly, and usually the expected profits would need to be substantially higher than the 'hurdle costs' before a factory is built. However, once the sunk costs are incurred, it could be rational for the factory to continue running even if the marginal revenue is less than the marginal costs, if the cost of shutting down the factor is high. The hurdle to get into a project and the hurdle to get out of a project create a 'zone of inaction'. Entry-exit decisions under uncertainty and sunk costs generate further embedded options and potential value in waiting to make a decision. In particular, the decision to enter or invest can be characterized as a call option, and the decision to disinvest or exit as a put option. Before entry and exit decisions are made, the value of those options needs to be taken into consideration in the cost-benefit analysis. This zone of inaction, on the face of sunk costs and uncertainty, typically generates behavioral inertia. Moreover, the larger the uncertainties and sunk costs, the larger the range of inaction.

We use the stylized diagram below to illustrate our point.



The diagram above shows two axis: the benefits and costs of being members of the EMU; and the probability of joining or leaving the EMU. This is not a linear or monotonic relationship. Rather, it is path dependent. From the perspective of an accession country (e.g., Sweden or the UK), the benefits of being a member of the EMU must not only be positive, but expected to rise above a certain threshold (**X**), for it to decide that it makes sense to be a member. Specifically, the value function is the difference between the NPV (net present value) of being an active member of the EMU minus the NPV of staying out (value in waiting). This accession path (1-2-3) looks like the payoff function of a call option. Indeed, one could think of the UK staying out of the EMU as holding a valuable call option – the option to enter at a later date. In an environment of uncertainty, there is value to waiting. This value is the value/premium of the option. The strike price is **X**. The decision to enter will only be activated if the expected NPV is above zero after factoring in the value of the call option, due to significant sunk costs attributable to this entry decision.

Once a member of the EMU club, given that a country cannot exit and re-enter as it wishes (notwithstanding the risks that an exit of one country could also jeopardize the whole project), and that there are likely further sunk exit costs, under uncertainty, the decision to exit now embeds a valuable put option. For an EMU member, the NPV needs to be below the hurdle at point (**Y**), in order for the country to call it quits. This succession path is 3-4-1. Again, this resembles the payoff function of a put option.

The probability of a country being a member of the EMU, therefore, is *path dependent*. This hysteresis effect creates a 'zone of inaction', whereby there is general support for maintaining status quo, as long as the costs and benefits are between **X** and **Y**.

The hysteresis idea has applications in electro-magnetics, electrical engineering, control systems, cell biology. In economics, the concept applies to investment theory, unemployment, and economic development. The idea even applies to decisions on marriages and divorces. The similarities between this type of analysis, the EMU project, and the decision to get married for most couples in real life portray incredible similarities. For most people, the decision to marry embeds a significant call option. Hence, under uncertainty and costly reversibility, most people take their time to get married. Typically engagements are used as deal sweeteners to manage the uncertainty of the process. (We note that the EU membership before the EMU entry can also be seen as an engagement before marriage. However, despite the fact that such an idea might have been fruitful for convergence countries such as Hungary, Poland etc., it was irrelevant and provided free options to developed nations such as the UK and Sweden, in our view). Once married, due to sunk exit costs and further uncertainties, many people prefer to remain married for several reasons, even though the initial conditions that triggered the marriage decision in the first place might be absent (i.e. to preserve the value of the put option embedded in staying married). Therefore, this type of inertia and inaction or delayed reaction, although seems irrational from the standard neo-classical point of view, in fact can be justified once embedded option values and hysteresis are taken into account. In our view, given that: i) sunk costs related to the EMU entry-exit decisions could be gigantic relative to member countries GDP levels; ii) uncertainty regarding the EMU project itself is currently elevated to extreme levels, we expect significant hysteresis and inertia might be able to explain the ongoing policy paralyses we are witnessing within the EMU at this stage.

Considering the frameworks outlined above, we have the following thoughts.

- **The costs of an EMU divorce have risen**. There seems to be the popular view, promoted by the Eurocrats themselves, that, if Europe buys enough time to build a robust firewall, the EMU could withstand shocks such as Greece leaving the EMU. The reality, however, could be precisely the opposite. The very policies that have been deployed to buy time, such as the ECB's LTRO, its SMP operations, and the substitution of private credit to

Greece with public credit from other EMU governments, have perversely *increased* the risk of contagion and therefore the costs of Greece leaving the EMU. We have long argued that the key to containing contagion is through 'segregation' of balance sheets. What Europe has done is precisely the opposite: 'aggregation' of balance sheets. This has exposed clean balance sheets (Germany, the Netherlands, and France) to polluted balance sheets (Greece, Portugal, and Spain). In the framework we described above, the very act of 'buying time' in the last two years has raised the value of '**Y**'. Further, the proposals recently made by the Southern European countries, such as the E-bond and the mutualisation of bank liabilities, would further raise the value of '**Y**', making it exponentially costly for any member to leave the EMU.

- **Different levels of 'Y'**. The values of 'Y' are different for different countries, and there are negative externalities to a country leaving the EMU. Here, we consider two perspectives: one for Athens, and one from Berlin. To Athens, the costs of leaving the EMU are likely to be significant in the short-run (though, looking at the experience of Iceland, it is conceivable that the cost-benefit tradeoff for Greece, if they leave the EMU, may be ambiguous over a longer time frame). It would of course make sense for Athens to extract as much financial support from the EMU as possible, before they devalue and default. At the same time, however, if Germany were to leave the EMU, the short-term costs to Germany are likely to be modest. The bund yields could be even lower, and the prospective appreciate in the DM is not likely to undermine Germany's exports, much of which are not that price-elastic anyway. In short, we suspect the 'Y' for Germany is less than the 'Y' for Greece. From a purely financial perspective, setting the political considerations aside, it seems that the hurdle for Germany to leave the EMU is less than that for Greece. Further, if we consider the collateral damage that the rest of the EMU might suffer from either Greece or Germany leaving the EMU, it could be argued, in certain circumstances, that the short-term side effects of Germany leaving the EMU could be *less* than those of Greece leaving. For example, Germany could commit to providing financial assistance as a member of the EU, for a transition period, but not as a member of the EMU.[2] Thus, ironically, the

[2] An EMU without Germany would of course not be good. However, in the scenario where Germany introduces a second legal tender (a new DM) that is circulated in Germany in parallel with the euro, Germany could gradually exit the EMU with less disruptions than if Greece introduced a new drachma.

short-run costs of removing the weakest member countries may be highest, while those of the strongest member leaving the union might be the lowest.

- **Micro benefits and macro costs**. 'X' and 'Y' can also be seen as the 'microeconomic benefits' and the 'macroeconomic risks', respectively. Fixed exchange rate regimes are dangerous because they create efficient gains at the 'micro' level (e.g., firms don't need to worry about exchange rate risks; one central bank interest rate applies to the whole EMU) at the risk of brewing macroeconomic imbalances (e.g., current account imbalances and eroding competitiveness in some countries). Perhaps a more clear analogy is the 'de facto dollar peg', whereby the RMB was pegged to the USD for much of the 2000s. As was the case in Europe, it was an efficient arrangement for two of the largest economies in the world to trade with minimal currency risk. However, what was deemed as a symbiotic relationship could quickly lead to dangerous imbalances. Thus, 'X' could be seen as the potential microeconomic gains for an accession country, while 'Y' is the potential macroeconomic risk for an existing member.
- **The experience with the former East Germany**.[3] One reason why Berlin has maintained a hardline stance on structural reforms and austerity is their experience with the former East Germany. The cumulative cost of subsidizing the former East Germany has reached around EUR1.7 trillion since 1990.[4] The population of the former East Germany is around 20 million. This is on par with the combined population of Greece (11 million) and Portugal (10 million).[5] We doubt that Germany is in the mood to enter into an indefinite 'transfer union' with other countries in Europe, knowing well how difficult and costly it has been to support East Germany.[6] Berlin is also well-aware of the fact that one of the key reasons for the persistent problems in East Germany was the German monetary union. In 1990, the West German government set the Ost Mark at half the value of the DM, even though it was trading at one tenth the value in the black market. For wages, the exchange rate was set at 1:1. Unemployment in the former East Germany rose from an official figure of zero in 1990 to more than 20% by 2005, and still hovers at around double the unemployment rate in West

[3] After the fall of the Berlin Wall in 1989, monetary, economic and social union occurred on July 1, 1991. Full political union took place on October 3, 1991.
[4] The fiscal burden to West Germany was colossal in the initial years, as the transfers to the former East Germany reached 4-5% of total GDP during the period 1991-2003.
[5] The populations of Spain and Italy are around 47 million and 60 million, respectively.
[6] One irony is that, prior to WWII, the per capita income in the former East Germany was actually higher than that in West Germany.

Germany (11.2% versus 6%). We do not believe Berlin has the appetite to enter into an open-ended 'liability-sharing' arrangement with its southern neighbors, with whom Germany feels no sense of kinship. In terms of our diagram above, the value of 'Y' may be large for Athens, but could in fact be negative for Berlin: Germany would gain financially if Greece left the EMU.

- **China's RMB**. The other fixed exchange rate regime that dominated the 2000s – the *de facto* dollar zone – has been quietly dismantled. By not having a formal monetary union, China was able to enjoy the microeconomic benefits without being trapped in the hysteresis. (The analogy is that China chose to cohabitate rather than enter into a marriage.)

Bottom line. Europe is in a mess. In this note, we propose a simple framework to help us understand why it is likely to remain in a mess. In 333 B.C., when Alexander the Great invaded Asia Minor and arrived at the town of Gordium, he came across an ox cart whose staves were tied in an intricate knot with the ends tucked away inside – the Gordian Knot. In front of a crowd, Alexander the Great struggled to undo the knot and became frustrated. He drew his sword, and in one stroke severed the knot. Maybe the EMU Knot can only be undone through a 'big bang'.

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