



IS THERE AN EASY WAY OUT? PRIVATE MARKETABLE DEBT AND ITS IMPLICATIONS FOR A EURO BREAKUP: THE CASE OF FRANCE

David Amiel, Paul-Adrien Hyppolite

► To cite this version:

David Amiel, Paul-Adrien Hyppolite. IS THERE AN EASY WAY OUT? PRIVATE MARKETABLE DEBT AND ITS IMPLICATIONS FOR A EURO BREAKUP: THE CASE OF FRANCE. 2015. hal-01117019

HAL Id: hal-01117019

<https://hal.science/hal-01117019>

Preprint submitted on 16 Feb 2015

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

IS THERE AN EASY WAY OUT?
PRIVATE MARKETABLE DEBT AND ITS IMPLICATIONS FOR A EURO
BREAKUP: THE CASE OF FRANCE

David AMIEL
Paul-Adrien HYPPOLITE

February 2015

Cahier n° 2015-02

DEPARTEMENT D'ECONOMIE

Route de Saclay
91128 PALAISEAU CEDEX
(33) 1 69333033

<http://www.economie.polytechnique.edu/>
<mailto:chantal.poujouly@polytechnique.edu>

IS THERE AN EASY WAY OUT? PRIVATE MARKETABLE DEBT AND ITS IMPLICATIONS FOR A EURO BREAK- UP: THE CASE OF FRANCE¹

David AMIEL, Paul-Adrien HYPPOLITE²

ABSTRACT

What would be the short-term financial consequences of exiting the Euro? This article addresses this issue by focusing on some key strategic non-financial corporations and systemic banking Groups of French nationality. We show that special attention should be paid to the marketable debt under foreign law issued to finance domestic activities which is unlikely to be redenominated in a devalued domestic currency, becoming suddenly much more difficult to service. What would be the magnitude of this effect? Drawing on a new database on debt securities compiled at the firm level and taking into account the nationality of the ultimate issuer, this paper identifies strategic and systemic French companies that would end up, in case of a Euro exit, with unhedged mismatches on their respective consolidated balance sheets, thereby triggering large negative balance sheet effects. These very mismatches would prove to be in fact very similar to currency mismatches faced by many financial and non-financial corporations in emerging economies at the time of the Asian crisis in the late 1990s, with the difference that they would be related to the juridical nature of the contracts instead of the currency of issue. We find that a significant share of the French financial and non-financial private sector finances its domestic activities with Euro-denominated debts under foreign law, which would ultimately remain in Euro and be repaid with a devalued currency if France were to leave the Eurozone. Historical examples support the idea that this “redenomination channel” has been crucial in explaining the successes or failures of exits from monetary unions. The “redenomination issue” played an important role in the 2002 Argentine collapse. On the contrary, some specificities, unlikely to be found in the Eurozone, of the widely-praised exits from the Gold Standard in the 1930s and of the “Velvet Divorce” in 1993 Czechoslovakia explain why this very issue was defused. Hence, the problem of private debt and the difficulties of redenomination appear to be much more formidable than conventional wisdom has long held and this should be kept in mind by policy makers.



¹ We are very grateful to our main advisors, Prof. Daniel Cohen and Antoine Frachot, for their continuous support and guidance.

² To contact us for any question or query, please write at david.amiel@ens.fr and paul-adrien.hyppolite@ens.fr.

I. INTRODUCTION

As the Eurozone crisis lingers on, debates on a potential demise of the common currency have been reinvigorated. Political parties advocating or contemplating an exit have not reached the same audience in every European country, but they are everywhere on the rise (“Alternative für Deutschland” in Germany, “Front national” in France, “Movimento Cinque Stelle” in Italy, “Podemos” in Spain etc.). Support for the common currency in public opinion, though still strong, is falling³. A euro exit, which was once only contemplated for “small” periphery countries as a consequence of high financial distress (for instance, a sudden stop of capital inflows) comes to be seen as a political choice that is worth being argued in core countries.

In the academic sphere, paradoxically enough, debates on the currency union are at the same time intensifying and returning to the same arguments that were used during the 1990s. Conventional wisdom holds that Europe is not an “Optimum Currency Area” since it does not fulfill any of the criteria laid out by Robert Mundell and its followers in the 1960s and 1970s. Mitigating asymmetric shocks through wage moderation is a very unreliable policy. Labor mobility within Europe is low, especially compared to the United States. Fiscal transfers, though sometimes provided in cases of financial distress and under severe conditions, are on the whole banned explicitly in the Maastricht Treaty and implicitly by the current political dynamics. The current distress of the Euro area, as well as the threat of deflation, seems to vindicate the fears of those who always warned against the impossibility for the Euro area to react to shocks⁴. The ones still striving to save the Euro tend to favor keeping the common currency on political motives and to bet on the ability of politicians to change the institutional features of the Euro area. Joseph Stiglitz epitomizes this position when he says: “The Euro can be saved, but it will take more than fine speeches asserting a commitment to Europe. If Germany and others are not willing to do what it takes – if there is not enough solidarity to make politics work – then the Euro may have to be abandoned for the sake of salvaging the European project”⁵. This “conditional support” seems now to have been the new conventional wisdom.

However, we hold that in this trade-off between “flexibility” and “stability”, a crucial factor is lacking: the costs of the exit *per se*. We argue in this study that exiting a currency union does not bring a country immediately back to where it stood before entering. Disentangling fifteen years of financial integration is not an easy task, neither legally, nor technically, and the financial costs of doing so can be very important. No one has better grasped this idea than Barry Eichengreen (2007) where he precisely points out the different ways this point could be made⁶. We build on his insight to show that a particularly tricky issue is the one of “redenomination” in the case of France. Neither French public authorities, nor French private actors ever considered the possibility of the Euro’s demise: they acted in a perfectly integrated financial system. A return to a domestic currency would entail sorting out the debts that would be redenominated in “new” French francs and those that would have to be still serviced in euros. Given that the “new” Franc is likely to depreciate against the Euro (actually, this is precisely the reason why most people want to exit), specific mismatches related to the redenomination of some but not all financial securities could hit hard on unhedged debtors in the same way currency mismatches hit emerging countries in the late 1990s.

We start by first reviewing the existing academic literature on currency mismatches and hedging strategies in both emerging and developed economies (section II). Then, we specifically address the case of France. After examining the legal aspects of the Euro exit (section III), we present a new database relevant to our topics that discriminates securities according to their governing laws, which we show to be a proxy for the likelihood of redenomination (section IV). We assess at 30% the amount of outstanding marketable debt of major French companies that could be turned into “new” francs which leads us to discuss and question Nordvig-Firoozye’s widely quoted results (section V). Drawing on our database, we provide some financial indexes and rank individual French companies according to the impact an exit could have on

³ We proxy “support for the Euro” by “trust in the ECB”. According to the Eurobarometer, 52% of Germans, 38% of French and 55% of Italians did trust the ECB in June 2005. In June 2014, these figures were respectively 38%, 28% and 22%.

⁴ Feldstein, M., “The Failure of the Euro”, *Foreign Affairs*, January/February 2012e.

⁵ Stiglitz, J., “What can Save the Euro?”, *Project Syndicate*, December 2011.

⁶ See also, Eichengreen, B., “The Euro: Love it or Leave it?”, *VoxEU*, May 2010.

their balance sheets to find not only that many would be negatively impacted, but that the most “strategic” ones (financial institutions, especially banks, as well as State-owned companies) would suffer the most. Safeguarding these companies may prove to be very costly for the French government (section VI). With this in mind, we question the robustness of our results to the inclusion in the database of bank loans and other missing debt securities (section VII).

We conclude by addressing some historical examples which we hold to be as relevant as possible to the Euro exit discussions, both because of their intrinsic features and their use as arguments in public and intellectual debates (section VIII). We argue that the Argentine crisis of 2002, while of an extreme magnitude, points towards the destabilizing factors an exit from a peg and an unsolved redenomination issue could have on the banking sector, especially in the context of a sovereign crisis. In 1993, Czech and Slovak Republics chose to split their currencies, as a result of their political divorce. This was rightly perceived as a success, but, as we shall see, grounded in some particular features of their economies, most of all the existence of a massive financial support from Prague to Bratislava. In the 1930s, both the United Kingdom and the United States have benefited from exiting the “Gold Standard”. But crucial was here the low dependence of their economies on the external world, Britain being the center of a major Empire and the United States being actually quasi-autarkic by modern standards at that time. On the contrary, Germany being exposed to currency mismatch problems resorted to all kinds of policies, short of formally exiting the Gold Standard.

All in all, we do not infer from this the infeasibility or the undesirability of a Euro exit. But we hope that our paper contributes to improve the opinions voiced on its respective costs and benefits. We argue that the Eurozone financial integration has been so deep that unilateral exits are likely to trigger important financial crises, a point that should be taken into account in all political discussions on the matter.

II. LITERATURE REVIEW

During the 1990s, many emerging market economies had a lot of dollar-denominated debts backed by local-currency income streams, thereby carrying currency mismatches on their consolidated balance sheets. Thus, firms were highly exposed to sudden foreign exchange movements, and in particular to local currency devaluation against the U.S. dollar. The currency crises of the late 1990s which culminated in large depreciations of local currencies were followed by sharp declines in investment, collapsing financial systems and sometimes deep recessions, largely triggered by huge currency mismatches on the domestic companies’ balance sheets.

The conventional open economy models *à la* Mundell-Fleming (1962, 1963) failed to explain how a domestic currency devaluation could result in a sharp economic contraction. Indeed, according to such models, a domestic currency devaluation should ultimately have an expansionary effect on domestic output because of large competitive gains for export firms generated over the medium-term. Since then, economists have conducted numerous research to gain a better understanding of the mechanisms involved in the currency crises of the 1990s.

From the standpoint of empirical research, Cespedes (2004), and Galindo et al. (2003a) notably outlined, using macroeconomic data, that high levels of foreign debt can partially or even sometimes fully offset and reverse the traditional expansionary effect of domestic currency devaluations on output. Allen et al. (2002) analyzed balance sheet exposures during the emerging market financial crises of the 1990s and demonstrated the ubiquity of currency mismatch exposures, on the side of banking industries, non-financial private sectors and even governments. Economists therefore developed several third-generation currency crises models (Krugman, 1999, Cespedes et al., 2000, Aghion et al., 2001, Chang and Velasco, 2001) to explain why currency devaluations may be contractionary, and result in large financial losses offsetting the competitive gains for export firms. Those models mainly highlighted the importance of post-devaluation balance sheet losses suffered by firms with unhedged foreign debt and modeled the related transmission mechanism towards the rest of the economy: tightened credit restrictions following firms’ balance sheet losses and related sharp decreases in private investment ultimately led to contractions of domestic outputs.

There has been large progress over the years regarding the measurements of the currency mismatches, which allowed to take into account both the liability and asset sides of firms' balance sheets as well as off-balance sheet exposures (see Goldstein and Turner, 2004, and Tobal, 2013). However, recent studies, focused on evaluating the empirical relevance of third generation currency crises models, are not perfectly conclusive. Galindo et al. (2003b) made a review of the literature around this subject. Among the academic studies which have used firm-level databases to estimate the impact on investment of large negative balance sheet effects triggered by domestic currency devaluations, there is indeed no unanimous agreement on whether or not the overall impact is negative or positive. For instance, Bleakley and Cowan (2002) showed on a sample of firms from Latin American countries over 1991-1999 that, following domestic currency depreciations, firms with higher amounts of foreign currency debt invested even more than other firms unexposed in theory to negative balance sheet effects. This evidence is contested by many other studies such as Janot et al. (2008) who found in the case of Brazil that firms with currency mismatches did significantly reduce investments more than firms without mismatches.

Besides, most firm-level studies show that, nowadays, firms actively match the currency composition of their assets and liabilities. Hedging strategies against the foreign exchange risk of firms that straddle the border and have overseas subsidiaries are of two types: first, "natural hedges" consist for the firm to match foreign assets with foreign liabilities, or foreign income streams with payables in foreign currency, and then "financial hedges" rely on the use of derivatives such as forwards, options or swaps to hedge any remaining foreign exchange exposure. Thus, in theory, taking on derivatives allow to hedge the foreign exchange risk when no "natural hedge" is available. In practice, Allayannis et al. (2001) have found evidence of such a complementary link between both types of hedging strategies for Asian countries. Nevertheless, after measuring foreign currency debt net of foreign currency assets and derivatives, Cowan et al. (2005) found in the case of Chili that although actively managing the foreign exchange risk, Chilean firms were still exposed to non-negligible negative balance sheet effects when the domestic currency depreciated.

The academic literature has made a great effort in analyzing and trying to understand the effect of domestic currency depreciation and the role of hedging strategies against foreign exchange exposures in emerging market economies. The focus on emerging market economies is obviously due to historical reasons. Hence, there has not been a lot of academic papers studying the effectiveness of hedging strategies of European firms to reduce for instance exchange rate exposures, as explained by Döhring (2008). Existing academic studies have largely focused on financial hedging and again a clear consensus regarding the effectiveness of these very hedging strategies has not emerged among economists. Hagelin and Pramborg (2004) conducted a survey on Swedish firms and found that they do hedge themselves against the foreign exchange risk and hedging does reduce exchange rate exposures. Döhring (2008) showed that euro-area exporters have instruments to prevent a negative balance sheet effect from deteriorating corporate profits in light of the euro appreciation against the U.S. dollar. However, Jong et al. (2006), using a sample of Dutch firms, contradicted that evidence showing that financial hedging did not reduce exchange rate exposures among the studied firms.

In France, Capstaff et al. (2007) proved that the introduction of the euro coincided with a decrease in notional amounts⁷ of FX derivatives held by French multinational firms on their balance sheets. This suggests that intra-Eurozone hedging is minimal, so that firms view the euro as irreversible and do not hedge themselves against "foreign" euros (i.e. euro-denominated securities under foreign law). Hence, the major French companies may not take into account the "redenomination risk" related to the potential redenomination of part (in differing ratios) of their assets and liabilities in the newly introduced devalued currency which could materialize following a unilateral French exit from the Eurozone - the question being whether or not, at the firm level, the percentage of liabilities to be converted would be greater than the percentage of assets.

⁷ Notional amounts of derivatives outstanding correspond to the underlying exposure being covered.

Drawing on this literature on currency mismatches and hedging strategies, we shift the debate away from the measurement of balance sheet effects in terms of currencies of issue toward the measurement of these very effects in terms of governing laws. Thus, in what follows, the issue we want to deal with is whether or not French firms are exposed to the political risk of a Euro exit, and if yes, what would be the immediate financial cost of an exit on the private sector and how to mitigate in the future French firms' exposures to a potential Eurozone break-up.

III. LEGAL ASPECTS OF THE EURO EXIT – THE REDENOMINATION ISSUE

Were France to exit the Euro, it would first face some major legal difficulties. Can France unilaterally decide to exit the Eurozone and to re-implement its own national currency? If yes, the broader the redenomination, the more effective and costless it is. But which contracts exactly could the French authorities legally decide to turn from euros into “new” francs? In this section, we explore some of these issues. We start by reminding some general features of monetary sovereignty, before turning to some specificities of the Eurozone and stating some reasonable assumptions on the scope of the expected redenomination process. The readers uninterested in the legal details relating to these matters could directly skip this part and read only its conclusion.

1. *Lex monetae*

The *lex monetae* is part of the customary international law. Though it is not enshrined in any formal treaty or explicitly binding agreement, the Court of International Justice and most national courts in the world recognize it as common practice. A landmark judgment was pronounced in 1929 by the Permanent Court of International Justice, in the Serbian and Brazilian Loan case, where it stated: “it is indeed a generally accepted principle that a State is entitled to regulate its own currency”⁸.

The attributes of monetary sovereignty are generally considered as including the three following rights for every State: (i) the right to issue its currency i.e. coins and notes that are legal tender within its territory, (ii) the right to determine and change the value of that currency, and (iii) the right to regulate the use of that currency or any other currency within its territory. These elements constitute the *lex monetae* and were upheld several times by international courts.

As long as monetary legislation does not specifically discriminate against foreigners and does not breach any international treaty ratified by the defendant, it can very rarely be successfully sued before international courts. A famous case, quoted by F.A. Mann in its authoritative book on international monetary law⁹, is the case of “Certain Norwegian Loans”. Norway, as well as Norwegian citizens, had before the First World War issued local-currency loans in European financial centers that included gold clauses. After 1923, it abolished them, stating that: “where a debtor has lawfully agreed to pay in gold a pecuniary debt in kroner and where the creditor refuses to accept payment in Bank of Norway notes on the basis of their nominal gold value, the debtor may request a postponement of payment for such period as the Bank is exempted from its obligation to redeem its notes in accordance with their nominal value” (Mann, *op. cit.*). France took up the case of some of the creditors in 1955, claiming that the abolition of the clause violated international law. The Court ruled out the case on the basis that it could not “rule on matters of domestic law”. To summarize, the Court vindicated Norway's claim that the question of gold clauses related to its currency fell within its own jurisdiction.

However, the boundary between what belongs to the respective sphere of “monetary laws” and “contract laws” is to be defined by each State according to its own private international law. Hence, some classification problems may arise, where changes in the unit of account are challenged on the basis of the laws of contracts. As we shall see later, it is unlikely to happen in the case of a Eurozone exit.

⁸ http://www.icj-cij.org/pcij/serie_A/A_20/62_Emprints_Serbes_Arret.pdf

⁹ Mann, F.A., “The legal aspect of money: with special reference to comparative private and public international law”, Oxford University Press, Oxford, 4th Ed., 1982.

Nevertheless, in most of the cases concerning for instance currency devaluation, issues at stake are clearly within the range of “monetary laws” and therefore it is a general principle that *lex monetae* applies to currency devaluations or depreciations as well. Let us note that whatever policy the European governments choose regarding the faith of the euro, contracts in foreign currencies (e.g. U.S. dollar or sterling pound) could not be affected by any redenomination undertaken by European authorities on behalf of the *lex monetae*.

2. How was the euro implemented and can it be undone?

After these preliminary remarks on the general rules of foreign law, we then turn our attention to the way the euro was implemented in the first place. It provides us with insights on how France dealt with the introduction of a new currency less than twenty years ago. To understand how the euro was implemented and replaced the national currencies, we do need to recall that it happened at three different levels: the domestic level (France), the European level and the international level (in New York or London for instance).

The Treaty of Maastricht, as it was signed on February 7th 1992, entailed substantial modifications to the Treaty Establishing the European Economic Community by widening the Community area of competence to monetary affairs. This required changing the French Constitution, whose Article 88.2 states (after it was altered on June 26th 1992): « Sous réserve de réciprocité, et selon les modalités prévues par le Traité sur l'Union européenne signé le 7 février 1992, la France consent aux transferts de compétences nécessaires à l'établissement de l'union économique et monétaire européenne ainsi qu'à la détermination des règles relatives au franchissement des frontières extérieures des Etats membres de la Communauté européenne. »¹⁰. Today, it has been further altered to account for the existence of the euro and is referred to as article 88-1: « La République participe à l'Union européenne constituée d'États qui ont choisi librement d'exercer en commun certaines de leurs compétences en vertu du traité sur l'Union européenne et du traité sur le fonctionnement de l'Union européenne, tels qu'ils résultent du traité signé à Lisbonne le 13 décembre 2007. »¹¹. The article 88.2 allowed the monetary law to be directly set up by the Community institutions.

In the aftermath of the Madrid summit (on December 15th and 16th 1995), a Community regulation was adopted on June 17th 1997 that defined for the future “participating Member States” – whose identities were still unknown – the goal of substituting the Euro to the European Currency Unit (ECU)¹² and to national currencies and the international identity of the new currency. But most of all, it stated that “the principle of continuity of contracts and other legal instruments shall apply between the former national currency and the Euro and between the ECU [...] and the Euro”¹³.

A second regulation was implemented on May 3rd 1998 in order to supplement the European monetary law. It designated the unit of account and its subdivisions, enumerated the list of participating States and paved the way for the transition phase. At this stage, it is worth reminding that a Community regulation is immediately applicable in all Member States so that it does not need to be translated into national law (this is one of the differences between a regulation and a directive). **Hence, the Euro is based on the European institutions themselves, to which the French Constitution has admitted a transfer of competences.**

¹⁰ “Subject to reciprocity and according to the provisions of the Treaty Establishing the European Union signed on February 7th 1992, France agrees to the transfer of competences necessary to the implementation of the economic and monetary union as well as to the determination of the rules governing the passing of the external borders of the Member states of the European Community”.

¹¹ “The Republic is part of the European Union, which is made of States having freely chosen to share some of their competences pursuant to the Treaty on European Union and to the Treaty on the Functioning of the European Union, as they result from the treaty signed in Lisbon on December 13th 2007”.

¹² “The European Currency Unit (ECU) was a basket of the currencies of the European Community member states, used as the unit of account of the European Community before being replaced by the euro on 1 January 1999, at parity” (http://en.wikipedia.org/wiki/European_Currency_Unit).

¹³ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31997R1103>

Exiting the Euro without exiting the EU?

The European treaties do not provide for any possibility of Euro exit. The article 3 of the Community regulation passed on May 3rd 1998 states that “The euro shall be substituted for the currency of each participating Member State at the conversion rate”¹⁴, which seems implicitly to assume this substitution to be everlasting. **Of course, treaties could be modified to allow for the possibility of an exit. But such a change would require the unanimity of the Member States, thereby making a long process of negotiations and ratifications necessary. It seems highly questionable that such moves could be made without triggering a disastrous vague of financial speculation. Hence, an exit must be a unilateral decision.**

Some commentators¹⁵ have claimed that the Vienna Convention of 1969 vindicates the right of a given State to repudiate the dispositions of a treaty, provided that “a fundamental change of circumstances” occurred. However, others¹⁶ have quite convincingly replied that such a change should be of tremendous magnitude and that an economic downturn could hardly qualify for it. Moreover, it has been added that international law does not regulate European law, the latter belonging to another sphere. The ECJ in the landmark case *Van Gend en Loos v. Administratie der Belastingen*, has explicitly ruled that EU treaties created “a new legal order of international law, for the benefit of which the States have limited their sovereign rights.”¹⁷

Nevertheless, since the Lisbon summit, Article 50 of the Treaty on the Functioning of the European Union provides the possibility for an exit of European Union as a whole (Article 50.1) which would imply *de facto* the invalidity of all treaties. But because such a move would result in much higher political and economic costs than a “simple” exit from the Eurozone, it is unlikely to be used. Hence, the most probable scenario is a unilateral but “illegal” exit with regard to European norms.

The uncertainty of national law

Were things to happen this way, who would have the ability in France to create and implement the new currency? As we have seen, monetary powers have been constitutionally surrendered to the European Union in the 1990s. **Moreover, the only precedent in the 5th Republic when the “ancien franc” was replaced by the “nouveau franc” took place under very specific circumstances that makes it poorly tractable.** Indeed, this monetary reform was passed through an “ordonnance” on December 17th 1958 that provided for the creation of a new monetary unit (at a date that was to be set afterwards by a decree, though no later than January 1st 1960), the conversion of all contracts - regardless of the moment at which they were signed - and the immediate quotation of all foreign currencies into “nouveau franc”.

This decision did not require any consent from the Parliament because the President, Charles de Gaulle, still benefited from the “pleins pouvoirs”¹⁸ that had been granted too him for six months by the last National Assembly of the 4th Republic on June 2nd 1958. But a “normal” functioning of the 5th Republic is entirely different. Article 38 of the Constitution stipulates that “ordonnances” must be allowed *ex ante* by a “loi d’habilitation” and *ex post* ratified by the Parliament. As the “Conseil Constitutionnel” ruled by his 76-72 decision made on January 12th 1977¹⁹, the “loi d’habilitation” must be as precise as possible: « Ce texte doit être entendu comme faisant obligation au Gouvernement d’indiquer avec

¹⁴ <http://www.nbb.be/doc/ts/eurosystem/art11E.pdf>

¹⁵ Tepper, J., “Primer on the Euro Breakup : Default, Exit and Devaluation as the Optimal Solution”, 2012

¹⁶ Athanassiou, P., “Withdrawal and expulsion from the EU and the EMU : some reflections”, ECB, Legal working paper series n°10, 2009

¹⁷ Quoted in Athanassiou (2009)

¹⁸ The President of France can be granted “emergency powers” should “the institutions of the Republic, the independence of the Nation, the integrity of its territory or the fulfillment of its international commitments be under serious and immediate threat” (French Constitution, article 16).

¹⁹ <http://www.conseil-constitutionnel.fr/conseil-constitutionnel/francais/les-decisions/acces-par-date/decisions-depuis-1959/1977/76-72-dc/decision-n-76-72-dc-du-12-janvier-1977.7519.html>

précision au Parlement, lors du dépôt d'un projet de loi d'habilitation et pour la justification de la demande présentée par lui, quelle est la finalité des mesures qu'il se propose de prendre »²⁰.

Hence, two scenarios are possible. Under the first one, a Euro exit takes place in a period of trouble, where the Government has already been granted exceptional powers to pass “ordonnances” that include monetary affairs. This is *mutatis mutandis* what happened in 1958. Under the second one, the government embarks on a voluntary policy of exit, and then faces a dilemma. It can go to the Parliament but then entails high risks of triggering an uncontrollable financial panic on the markets. Or it can bypass it, but then paves the way for many challenges before the “Conseil Constitutionnel” (the highest constitutional authority in France). This could considerably cripple the smooth transition to the new currency by raising doubts on the true values of contracts until the judiciary makes up its mind.

3. Governing laws and their issues

Let us assume that France is able to overcome its own internal juridical constraints to implement the new monetary law following an orderly exit from the Eurozone. Let us assume also that it chooses to leave the Eurozone without however exiting the European Union (EU). We hold these two assumptions to be the most reasonable that can be made on such tricky matters.

As we have noted at the beginning of the study, both foreign and domestic courts should uphold the redenomination required by French law as long as the currency involved is the “French one”, according to the general provisions of the *lex monetae*. Concerning “undoubtedly” foreign currencies (e.g. U.S. dollar or pound sterling), there is obviously no way this could be altered on the basis of the *lex monetae* which would be extended well beyond its legal boundaries. Concerning euros, troubles occur because the Euro is a currency shared by 18 countries, without *a priori* clear-cut ways to distinguish if it was implicitly referring towards the “French Euro” or, for instance, the “German Euro”. Furthermore, the overwhelming majority of contracts do not include any clause regarding a “Euro exit” or referring specifically to which country’s currency payments have to be made with.

Then, some “implicit nexuses” will have to be found to determine the exact scope of the French *lex monetae*. Among these, the most often quoted are: the governing law of the contract, the place of payment or the relevant bank account, the status of debtor (there is a general presumption that the government transacts in its own currency), the “intentions” the parties had reasonably in mind at the time of the contract, the nationality of the parties etc.

It is commonly assumed that local (i.e. French) courts would “redenominate” the vast majority of the contracts they would have to judge upon (except of course contracts in foreign currencies). Indeed, they would likely be forced to do so by a comprehensive and *ad hoc* legislation provided by the national authorities that would closely guide the redenomination process within the country – as has most often been the case when a new currency was created (many examples of which can be drawn from the end of the colonization). Though, it does not immune that legislation from being challenged for instance by creditors before foreign or international courts for extending the scope of the monetary law beyond its natural boundaries, and thereby violating the “*lex monetae* principle”. However, it seems dubious that it could be overturned for at least three reasons. First, the governing law of the contract is, in itself, an indication of the nationality of the currency implicitly referred to. Second, by the time the process goes on, an international agreement may have been reached that would have been translated into national legislations barring any further challenge. Third, even allowing for a successful challenge by foreign courts against the domestic legislation, the debate would be moved to complex questions of conflict of laws and hierarchy of norms, whose resolution would ultimately depend on the legislation of the different countries, the treaties they have signed etc.

²⁰ “This text must be understood as requiring the government to precisely indicate to Parliament, when a bill of “loi d’habilitation” comes before it and for the purpose of vindicating its demand, the precise end of the measures it intends to take”.

The real problems thus arise when governing laws are foreign. Here the question of whether the euro keeps on existing is crucial. If it is the case, it is very unlikely that, barring specific legislation, Courts would apply redenomination. Such cases were common after the demise of Austro-Hungary, with plaintiffs refusing to pay their debts into Austrian crown on the grounds that the Empire no longer existed. However, they were always ruled out. In that case, all French payments governed under foreign law (British or American for instance) would have to be paid in euros. Note that this provides an important incentive for Germany to keep the Euro instead of returning to the “Deutschmark”, if for instance many members were to leave the monetary union. Since we can assume that Germany is a net creditor towards the other European countries, any agreement leading to reducing the nominal debt owed by the latter is reached at its detriment. By keeping the Euro, it does spare itself legal costs as well as the implications of a potential redenomination of its claims.

If the Euro disappears as a whole, then the situation becomes very tricky. British and American courts would have to turn to their own specific practices, customs and legislations to sort out the different contracts according to the criteria indicating “implicit nexus”, as explained above. This process is likely to be long and costly, and therefore may be “short cut” by adequate legislations, providing for instance for the replacement of euros by a basket of the new currencies. But all this is pure speculation. In the short run, what is sure, is that these payments would not be able to be made with “new” French francs.

An additional element worth reminding is that Britain is, contrary to the United States, a member of the European Union, though not of the Eurozone. Proctor (2011) has for instance underlined that British Courts cannot pay any attention to foreign laws that run contrary to British “public policy”. More specifically, that would mean that a unilateral move such as an exit from the Eurozone, breaching the Treaties ratified by the United Kingdom could not be vindicated on any ground. Then, “redenomination” could not apply in the United Kingdom.

An issue arises concerning the notion of “frustration” that enables, according to the law of contracts, parties of being discharged from their obligations in case of a radical change in the ability to meet their obligations due to an unforeseen external event. Proctor (2011) makes a powerful case against it, which seems to have become conventional wisdom on the topic, by tackling the prospects for a Greek exit. If payments are still to be made in euros, then there is no “radical change in circumstances”. If payments are to be made in drachma, then it means that contracts are subject to the Greek *lex monetae* which specifically provides for the continuity of contracts. However, in the case of a complete dissolution of the Eurozone, such a question may prop up again. But it seems hardly believable that they would entail the nullification of contracts. On the contrary, the “sorting out” process according to the “implicit” governing law seems likelier. But this issue is undoubtedly still opened to further debate.

Eventually, based on all these factors, we hold the “governing law” to be the most predictive index of the extent of the devaluation. In the following study, we assume that contracts in euros and under “French law” would be paid in the “new” French Franc (i.e. would be redenominated), while contracts under “foreign law” will be paid in the “old currencies”, be they euros or other foreign currencies.

IV. THE DATABASE

In the following technical section, we first explain how the database was constructed, and then present and discuss the main findings.

1. Construction of the database and main findings

We used a Bloomberg terminal²¹ to build a comprehensive database covering the marketable debt of the major French financial and non-financial corporations in order to obtain the governing law of each debt security²². By definition, marketable debt securities include all debt securities on the consolidated liability sides of companies that are transferable and can be bought and sold to a third party on the secondary market, i.e. mainly corporate bonds and some money market instruments such as high grade commercial papers.

We have identified 62 French companies, of which 14 are financial corporations and 48 non-financial corporations²³. The vast majority of these companies are of French nationality. We have only included in the database three affiliates of non-French companies (HSBC France, Dexia Crédit Local and Numéricable)²⁴.

The main advantage of this approach is to obtain specific data for each company, including the parent company and its domestic and foreign affiliates, thereby allowing us to perform a firm-level analysis at the Group consolidated level. We indeed consider that, to carefully assess the risk of a Eurozone exit on the private sector of a given country, one should (i) evaluate the impact at the firm-level, and (ii) treat (when relevant) outstanding debt securities issued by foreign affiliates similarly to those issued by the parent company. In other words, we considered the nationality of the ultimate parent company rather than the residence of the immediate issuer to determine the country of issue.

To our knowledge, our database is the first one based on the concept of nationality of the ultimate issuer that seeks to measure the percentage of the French private sector's marketable debt under French and foreign law. The aggregated results of our database are the following (as of August 2014):

	Total private sector (amount outstanding in €bn)	% of total
Debt securities under foreign law	480,5	37%
of which in EUR	272,7	21%
of which in foreign currencies	207,8	16%
Debt securities under French law	441,5	34%
of which in EUR	389,6	30%
of which in foreign currencies	51,9	4%
Debt securities under N/A law	376,6	29%
of which in EUR	279,2	22%
of which in foreign currencies	97,4	8%
Debt securities to be redenominated	389,6	30%

Source: Bloomberg

Note: N/A means "non available" (i.e. the information is not available on Bloomberg)

Debt securities to be redenominated are securities in EUR under French law (worst case scenario)

2. The issue of non-available governing laws

As shown in the table above, there are 29% of all debt securities for which the governing law is unavailable on the Bloomberg terminal. But this is only problematic for the euro-denominated ones (as the foreign currency-denominated ones cannot be redenominated as explained in section III). Thus, in our database, euro-denominated debt securities for which the governing law is not available on the

²¹ Bloomberg Professional service.

²² Note that all debt amounts are presented at face value in what follows.

²³ For the construction of the sample, we have selected companies which had on the Bloomberg Terminal (as of August 2014) a significant amount of outstanding debt securities. Other companies could be added to the sample but we have tried to build the broadest sample possible. The 62 selected companies account for two-thirds of the total outstanding private debt securities according to the Bank for International Settlements. To account for this difference, it should be kept in mind that some debt securities included in the BIS database are not listed on Bloomberg Terminals (e.g. most private placements and money market instruments). Extending the sample to medium-sized companies with market access could be an interesting perspective for future research. One should also note that small businesses which rely almost exclusively on bank debt as a source of funding are, by construction, excluded from the database.

²⁴ I chose to include these very affiliates because they issue in their own names a non-negligible amount of debt securities and could be regarded because of their size as "French companies".

Bloomberg terminal account for approximately 22% of all debt securities (in terms of amount outstanding).

The percentage of euro-denominated debt securities with non-available governing law among total marketable debt can vary significantly among firms: between 0% for 29 firms out of the 62 selected, slightly above 50% for Société Générale or HSBC France for instance, and up to 100% for Thales. The broad picture is that the percentage of debt securities with non-available governing law is higher for financial corporations than for non-financial corporations, which may account for the higher degree of variety and complexity, as well as the related lower tractability of debt securities issued by financial corporations.

Hence, the relative importance of euro-denominated debt securities with non-available governing law in the data leads us to basically consider three scenarios: (i) a best-case scenario where all debt securities with non-available governing law are actually under French law, (ii) a baseline scenario where half of the securities in question are under French law and half under foreign law, and finally (iii) a worst-case scenario where all the securities with non-available governing law are under foreign law.

One can reasonably consider that following a unilateral French exit from the Eurozone, the outcome would very likely be close to the worst-case scenario, so that only 30% of private debt securities of the main French companies would be redenominated (see table above). Indeed, the examination of the database shows that the securities with non-available governing laws have generally been issued on foreign primary markets as reflected by their respective ISINs (International Securities Identification Numbers) on the Bloomberg terminal. Hence, given the close relationship between foreign primary market issuance and foreign governing law (BIS Quarterly Review, December 2012), it is reasonable to consider that the outcome of a Euro exit would be much closer to the worst-case than to the best-case scenario.

3. Consistency of the database (comparison with the BIS database)

Checking the consistency of the database is not an easy task as it is probably the first of its kind. Nevertheless, the BIS (Bank for International Settlements) provides data on debt securities which are a very valuable source of information. First of all, all amounts of outstanding debt securities are presented at face value in the BIS database, exactly as in our database. Furthermore, the BIS displays “debt securities statistics” which are grouped into “sectors” (“financial corporations”, “non-financial corporations” etc.) and classified in two main categories, namely “international” and “domestic” debt securities.

In order to distinguish between “international” from “domestic” debt securities, the BIS considers three criteria: (i) the registration domain (ISIN) or, in other words, the location of the primary market where the issue took place, (ii) the listing place or location of the secondary market, and (iii) the governing law of the very debt security. The country information associated with each of these criteria is compared with the country of residence of the issuer and if at least one country information differs from the country of residence, then the debt security is considered as “international”. By definition, a domestic debt security is necessarily a security under French law, whereas an international debt security is not necessarily a security under foreign law. Hence, given the way the BIS builds its database on debt securities, it is impossible to obtain an accurate percentage of the amount of outstanding international debt securities under French law. However, according to the BIS, this amount should be relatively low. Indeed, even if the historically close relationship between the targeted investor base, the currency of issue, the location of primary and secondary markets and the governing law has weakened since the beginning of the 21st century, “there remains a close relationship between the primary market and other ways of distinguishing an international bond” such as the governing law (BIS Quarterly Review, December 2012).

Finally, it seems reasonable to assume in a first approach that “international debt” reported by the BIS expressed as a percentage of the “total debt” is a good proxy for the percentage of marketable debt under foreign law.

Moreover, within international debt securities, issues are ordered following either the concept of “residence” or “nationality” of the issuers (i.e. by “country of operation of the issuer” or by “country of operation of the issuers’ owner”). Hence, **the BIS data on debt securities sorted by the nationality of the issuer are particularly well-suited to provide the basis of comparison we need to check the consistency of our database.** Indeed, both approaches are based on the same definition of the relevant unit of analysis (the nationality of the firms) and discriminate issues according to the criterion of the governing law.

However, data on domestic debt securities provided by the BIS are less tractable. Indeed, the main problem stems from the fact that domestic debt securities provided by the BIS are not compiled on a security-by-security basis as opposed to international debt securities. Domestic debt securities are “aggregated data previously retrieved by the BIS from publicly available sources, mainly central banks, national statistical offices and stock exchanges” (BIS Quarterly Review, December 2012). By construction, they are only available according to the residence of the immediate issuer (and not the nationality of the ultimate issuer). But taking into account that our database already includes the three major affiliates of foreign Groups residing in France and issuing domestic debt securities (namely HSBC France, Dexia Crédit Local and Numéricable) on the one hand, and that issues by non-national residents still account for a relatively small part of total domestic debt securities on the other hand²⁵, the two databases can be meaningfully compared.

The total private marketable debt in our database (€bn 1298.6) covers almost two-thirds of the total private marketable debt outstanding according to the BIS (€bn 2064.1) (see the summary of BIS data in Appendix). Given that domestic debt securities are by construction securities under French law, if one considers, as stated previously, that international debt securities are in foreign law, one obtains from the BIS database the following figures:

	Total private sector (amount out.)	% of total
Debt securities under foreign law	1427,3	69%
Debt securities under French law	636,8	31%
<i>Source: BIS, own assumptions</i>		
Note: private sector includes financial and non-financial corporations		

Finally, we found extremely close figures between the two databases: while the percentage of debt securities under French law was of 34% in our sample, it is of 31% in the BIS database. Assuming that there is in the BIS database among international debt securities a non-negligible share of debt securities under French law issued for instance on foreign primary markets or trading on foreign secondary markets - let’s assume up to 5-10% of the total marketable debt, results are still very close. Indeed, assuming up to 36-41% of debt securities under French law appears as a plausible estimate consistent with the data, given that the sample includes essentially the largest French international Groups which may have on average a higher propensity to issue debt securities under foreign law as compared with the French private sector as a whole.

4. Short-term private marketable debt

Now, looking not only at the percentage of debt securities under French law for the total marketable debt but also for the short-term marketable debt, defined as principal and interest payments due between August 2014 and end 2015, we found slightly different figures pointing to a higher (77% vs. 70%) percentage of debt securities under foreign law falling due before end 2015 (detailed data shown in Appendix).

This may suggest that French companies issued relatively more debt securities under foreign law in the past and tended to issue relatively more under French law over the recent years. The

²⁵ One should also note that private international debt is far higher than private domestic debt, so that including domestic debt securities issued by non-residents in the total private debt is not likely to change significantly the aggregated results.

initiatives conducted by “Paris Europlace” and the French Ministry of Economy and Finance set up starting from 2010 aiming at strengthening the position of the Paris financial centre in the post-crisis economy may explain in part this potential increase of debt issues under French law²⁶. As such, it is likely that the percentage of marketable debt to be redenominated would tend to gradually increase over the coming years if the tendency to issue more debt securities under French law proves to be true and continues.

V. ARE NORDVIG-FIROOZYE WRONG ON FRANCE?

In a widely quoted article, J. Nordvig and N. Firoozye (2012) write: “France is one of the few countries which could benefit significantly from a less overvalued currency, but at the same time would not suffer meaningfully from negative balance sheet effects”²⁷. According to our database and the careful analysis of the French private marketable debt, these conclusions may be all the more controversial that Nordvig-Firoozye might largely overestimate the percentage of outstanding debt securities under domestic (i.e. French) law. Their data for the French private sector are the following²⁸:

	Total private sector (amount outstanding in €bn)	% of total
Debt securities under foreign law	494	33%
of which in EUR	324	22%
of which in foreign currencies	170	11%
Debt securities under French law	925	61%
of which in EUR	895	59%
of which in foreign currencies	30	2%
Debt securities under N/A law	87	6%
of which in EUR	44	3%
of which in foreign currencies	43	3%
Debt securities to be redenominated	895	59%

Source: J. Nordvig, N. Firoozye (2012), “Rethinking the European monetary union”, p74

Note: N/A means “non available” (i.e. the information is not available on Bloomberg)

Debt securities to be redenominated are securities in EUR under French law (worst case scenario)

As the above table makes clear, Nordvig-Firoozye’s data differ very substantially from ours: according to our calculations, only 30% of debt securities in the sample (€bn 1299) could be redenominated in case of a unilateral French exit, whereas the corresponding figure in Nordvig-Firoozye’s sample (€bn 1506) is of 59%. This very significant difference, which may actually lead to opposite conclusions regarding the magnitude of the balance sheet effects, must be further analyzed.

1. Residence vs. nationality of issuers: two concepts that may provide different results

Statistics of balance of payments, net foreign asset positions or national accounts compiled by national central banks and competent national agencies, measure external debt using locational definition, thereby identifying for instance issuers by the country of “residence” (i.e. the country of operation of the issuer) rather than by “nationality” (i.e. the country of operation of the issuers’ owner). As such, if for instance Banca Nazionale del Lavoro, the Italian subsidiary of the French banking Group BNP Paribas, issues a corporate bond, the issue will appear as part of the private sector of Italy, rather than France. It can make sense to consider the securities of a foreign subsidiary of a domestic firm

²⁶ New proposals to strengthen the euro bond markets on the Paris market were published in 2010 (http://www.paris-europlace.net/files/cp_hcp_180110.pdf). More recently, the establishment of the “Comité Place de Paris 2020” reflects public authorities’ awareness of the need to address the issues and challenges the Paris financial center faces. In that respect, the French regulatory authorities could put in place a legally binding framework to give more credit to these very initiatives, thereby creating in particular clear incentives for the French companies to reinforce debt issues under French law.

²⁷ J. Nordvig, N. Firoozye, “Rethinking the European monetary union” (2012), p37.

²⁸ Ibid, p74.

as belonging to the private sector of the foreign country because the center of economic activity is located abroad and the foreign debt securities issued by the subsidiary are backed by foreign assets.

As explained by Shin and Zhao (2013) and Chung et al. (2014), the distinction between residence and nationality of the issuer is becoming statistically more and more significant and relevant, as both the amount of offshore foreign currency debt issued by corporations through overseas subsidiaries and of cross-border bank lending sharply increased in a number of emerging and developed economies over the recent years. To go back on the previous example involving BNP Paribas, one may say that including the debt issues of its Italian subsidiary Banca Nazionale del Lavoro in “French” statistics is a pointless exercise in our case. Indeed, the financial securities on the subsidiary’s asset and liability sides being under foreign law, they would stay in euros without any impact on the Group’s consolidated balance sheet in case of a unilateral French exit from the Eurozone and a survival of the common currency. Nevertheless, **including debt securities issued by foreign affiliates in French statistics may prove to be much more relevant in other cases (e.g. if debt securities are issued to finance activities in France through special purpose vehicles located abroad or foreign affiliates without any local activities).**

As firms’ activities do straddle the border and their affiliates issue debt securities in their own names, measuring the external debt or the foreign-law exposure using the concept of residence of the issuer may result in small net external debt positions (e.g. if a foreign subsidiary issues foreign currency bonds backed by domestic currency financial assets, it would not be relevant to the net foreign assets’ accounting) or underestimate the share of debt securities under foreign law, thereby not capturing the effective exposure of the domestic firms’ consolidated balance sheets to the “redenomination risk”. **Groups are indeed financially interdependent and must be studied as such: if for instance the debt owed by an affiliate abroad with little or no local activities skyrockets, it will ultimately impact the solvency of the parent company as well.** Hence, one interested in obtaining the percentage of debt securities under French law issued by companies of French nationality at the Group consolidated level cannot consider Nordvig-Firoozye’s data as reliable because their database is based on the concept of residence of the immediate issuer.

Therefore, to assess the risk exposure of the French private sector to the exogenous shock represented by a unilateral French exit from the Eurozone, we find it more relevant to adopt an approach by nationality of the issuer at the firm level, thereby including the debt securities issued by non-resident nationals and looking at the breakdowns of the respective consolidated balance sheets in terms of both domestic or foreign currencies and local or foreign governing laws. **Hence, the two different methodological approaches - by residence of the immediate issuer or nationality of the ultimate issuer - may explain in part why Nordvig-Firoozye’s data differ from ours.**

2. Questioning Nordvig-Firoozye’s data for France

However, if one considers as stated before that the “international debt” reported by the BIS expressed as a percentage of the “total debt” is a good proxy for the percentage of corporate debt under foreign law, one obtains for France that 69% of corporate debt is under foreign law according to the nationality of issuers and 67% is under foreign law according to the residence of issuers (see BIS data in Appendix). **While our data and the ones of the BIS are extremely close (69% in the BIS data to be compared with 70% in our data by nationality of issuers), Nordvig-Firoozye’s data differ very substantially from the ones of the BIS (67% in the BIS data to be compared with 41% in Nordvig-Firoozye’s data by residence of issuers)²⁹.**

Assuming our data are (more) accurate, two conclusions can already be drawn: (i) our database which focuses on the main French companies and covers two-thirds of the total private marketable debt

²⁹ Note that we pay attention to compare like with like: Nordvig-Firoozye’s data are compared with BIS data according to the residence of the immediate issuer while our data are compared with BIS data according to the nationality of the ultimate issuer (for further details, refer to Appendix).

provides a good estimate of the average share of private marketable debt under foreign law for the French private sector as a whole, and (ii) there is a close relationship between the governing law and the location of the primary and secondary markets, consistent with BIS statements. **In turn, this means that Nordvig-Firoozye data are questionable in the sense that they largely overestimate the share of debt securities under French law which should be close to 33% (BIS data) and not 61%.**

An analysis of Bloomberg data does confirm that there is a strong correlation between the governing law and the location of the primary market of issuance, as stated by the BIS statisticians themselves, because when the ISIN of a given security indicates that the security has been issued on a non-domestic primary market, the governing law (when available) is almost systematically a foreign one. **For the Nordvig-Firoozye' data to be consistent with the BIS data, 28% of all debt securities (or equivalently 42% of BIS international debt securities) should be under French law and have been issued on foreign primary markets or be trading on foreign secondary markets.** On the basis of the previous remarks, we do not believe that it is possible: this would imply a too weak relationship between governing law and location of the primary and secondary markets.

Hence, one could question the quality of Nordvig-Firoozye's data for France. This issue is not marginal: a key finding of Nordvig-Firoozye's research, further developed in J. Nordvig's book "The Fall of the Euro" (McGraw-Hill Professional, 2013), is indeed that the French private sector largely relies on local law debt issuances which leads to the conclusion that France may not suffer meaningfully from negative balance sheet effects if it were unilaterally exiting the Eurozone. But in fact, as the majority of French companies do largely rely on foreign law debt issuances, the question of whether the balance sheet effects would be small or not needs to be further analyzed.

VI. FIRM-LEVEL ANALYSIS

Using our database, we obtained for each of the 62 selected companies the percentage of marketable debt to be redenominated in case of a French exit from the Eurozone. As highlighted before, even if the main French issuers are highly internationalized groups, they do not have neither the same percentage of debt to be redenominated nor the same percentage of sales or revenues made in France. These discrepancies must be taken into account to assess the exposure of each firm to the Euro exit. **Hence, capturing the incidence of the redenomination risk on the French private sector relies on disaggregated data to account for the specificities of each firm's consolidated balance sheets³⁰.**

French companies being highly modern and complex, one may consider that they are perfectly hedged against any currency mismatch thanks to natural (i.e. matching foreign liabilities with foreign assets) or financial (i.e. taking on derivatives) hedging strategies. But even if potential exposures of French firms to foreign exchange variations of the Euro against other currencies are perfectly hedged by income streams and assets in the corresponding currency or by FX derivatives (e.g. forwards, futures or swaps), a French exit from the Eurozone may negatively affect the private sector as a whole or at least some individual companies because of large post-devaluation losses resulting from unhedged foreign-law exposures on euro-denominated debt³¹.

In the sample, the share of foreign-law euro-denominated debt securities is indeed very large: it represents 42% of total private marketable debt, and almost 60% of euro-denominated private marketable debt securities (see above table). This means that on average, the main French companies issue a large share of their marketable debt in euros but under foreign law. If it turns out that these very foreign-law securities are backed by sales or revenues made in France, then some companies may be

³⁰ Studying the French marketable debt by nationality and not residence of issuers takes then on its full meaning.

³¹ The European companies considering the euro as irreversible, they do not seem to hedge themselves against the risk of break-up. One simple hedge would be to reinforce debt securities issues under domestic law.

exposed, in case of a French exit from the Eurozone, to a mismatch conceptually close to a currency mismatch.

In what follows, we adopt a two-step approach: for each company (at the Group consolidated level), we first (i) construct a measure of the effective mismatch between the geographical income structure and the share of marketable debt to be redenominated, and then (ii) use both debt and debt service coverage ratios to gauge the impact of the Euro-exit on the capacity to take on new loans or tap the international debt markets at reasonable costs or service its debt following the redenomination of part of its marketable debt.

1. Measuring the mismatch companies may have on their consolidated balance sheets

An appropriate measure of any mismatch on the balance sheet of a given company needs to take into account both the liability and the asset sides of the consolidated balance sheet in order to determine a net effect. Therefore, we define for any given company i a **mismatch indicator** as follows (α_i being the percentage of debt to be redenominated for company i , and β_i the share of sales or revenues made in France by company i):

$$Mismatch = \frac{1 - \alpha_i}{1 - \beta_i}$$

The geographical breakdown of sales for non-financial corporations and revenues for financial corporations is available in annual reports published by French firms and collected by the “Autorité des Marchés Financiers” (the stock market regulator in France). **Most importantly, the percentage of sales or revenues made in France can be considered as a good proxy for the percentage of domestic assets on the asset side of the consolidated balance sheet of each company.** Besides, the percentage of debt to be redenominated is calculated as explained previously. By construction, if the percentage of debt to be redenominated is lower than the percentage of sales or revenues made in France, then the mismatch indicator is above 1 and the company as a whole faces a mismatch between its income and debt structure.

For the whole sample of the 62 selected companies, the percentage of debt to be redenominated is of 30% and the percentage of sales/revenues made in France is of 36%. The mismatch indicator is therefore 1.1. Thus, the French private sector as defined by the sample of the 62 selected companies faces only a slight mismatch at the aggregate level.

But if the aggregate impact on the French private sector is interesting on initial examination, one needs to look at the firm level by decomposing between non-financial and financial corporations. We have grouped the selected companies in three categories according to the level of the mismatch indicator: a company experiences a “strong mismatch” if the mismatch indicator is above 1.5, a “low mismatch” if the indicator strictly lies between 1 and 1.5, and “no mismatch” if it is inferior or equal to 1. Results for non-financial and financial corporations can be found in Appendix³².

Non-financial corporations

At the aggregate level among non-financial corporations, the mismatch indicator is equal to 1.0, which means that there is no mismatch. Nevertheless, **19 out of the 48 selected non-financial corporations present a mismatch on their consolidated balance sheets. We found five particularly worrying cases: SNCF, Orange, Carrefour, Unibail-Rodamco and Numericable.** Orange for instance makes 50% of its sales in France, while only 5% of its marketable debt can be redenominated. Carrefour exhibits

³² Note that because we have for some companies 100% of sales or revenues made in France, the mismatch indicator may go to infinity. When this happens, we assess on a case by case basis whether or not the mismatch can be considered as a strong or low mismatch. Take for instance SNCF and Aéroports de Paris (ADP): SNCF makes 100% of its sales in France and has 0% of debt to be redenominated, so that the mismatch is considered as “strong”, while ADP makes 100% of its sales in France with 88% of debt to be redenominated, so that the mismatch is considered as “low”. Complete details about each companies can be found in Appendix.

similar figures, with 47% of its sales made in France and only 1% of its marketable debt which could be redenominated. SNCF is an extreme case, with 100% of its sales made in France and 0% of its debt securities to be redenominated due to debts which have systematically been issued under foreign law. Hence, if the French non-financial corporations as a whole do not seem to present any mismatch on their consolidated balance sheets, there are some specific cases which are deeply worrying. In practice, a Euro exit and a devaluation of the new currency may trigger large negative balance sheet effects for these very firms.

We hold that the firm-level analysis is much more relevant to the potential costs of a Euro exit than aggregated figures. Indeed, it would be a wishful thinking to believe that there would be any form of cost allocation between companies. Cost-sharing policies between firms have never been successful in the past. The most exposed firms would ultimately bear the costs of the devaluation and may be forced to engage in painful debt restructuring processes involving difficult adjustments for their creditors, shareholders and customers.

Financial corporations

The general picture for financial corporations is different: **the aggregated mismatch indicator is 1.2 which means that financial corporations as a whole experience a mismatch.** The vast majority of financial institutions suffer from low to high mismatches. Since these companies are obviously of highly strategic importance, their financial difficulties could trigger a systemic danger. In fact, while they issue a large share of their debt securities under foreign law, a large part of their revenues are made in France. Groupama is the only French financial corporations which does not experience any negative mismatch on its consolidated balance sheet.

Besides, when considering only the French banking groups and therefore excluding other financial corporations, the aggregated mismatch indicator becomes 1.6. Hence, there is a strong mismatch among French banks.

Finally, one can state that a non-negligible number of French companies and notably French banks seem to finance domestic (i.e. French) activities with foreign-law debt issuances. It implies that such companies face a mismatch at the consolidated Group level. Hence, a depreciation vis-à-vis the Euro of the newly introduced French franc following the exit from the Eurozone would create negative balance sheet effects, and may destroy a substantial part of the net worth of the companies concerned.

It should also be pointed out that, on average, “short-term mismatches” would tend to be even more worrying given the higher percentage of short-term marketable debt under foreign law. To understand to what extent these weaknesses in balance sheets would impact the books of the considered firms, we need to resort to two other types of index.

2. The impact of the Euro exit on the debt coverage ratios and the related capacity of firms to borrow

To quantify the impact of a French exit from the Eurozone on the French companies at the firm level, we looked, for each firm, at the variation of two very similar types of debt ratios depending on whether or not France decides to leave the Euro.

The first measure is the debt coverage ratio (DCR) defined as the ratio of Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) over total marketable debt. The second one is the debt service coverage ratio (DSCR) defined as the ratio of EBITDA over debt service, which enables us to focus on the short-term marketable debt³³. These financial coverage

³³ EBITDA is an appropriate indicator of a company's ability to make its interest payments. In the computations, debt service is defined as the sum of principal and interest payments on marketable debt falling due before end 2015. As the Bloomberg data are as of August 2014, we adjust EBITDA by multiplying the last data available (2013) by 1.4 to compute the DSCR. Note also that, most of the time, annual reports do not report

ratios are commonly used, notably by banks and market players, to assess a firm's debt sustainability and ability to rollover its debt. If the DCR or DSCR of a given company is considered as too high, rating agencies may lower the company's rating, banks may become reluctant to grant any loans and the coupon rates of new corporate bond issues may significantly increase. **Hence, whether the Euro exit affects negatively or positively, the DCR or DSCR would determine if the companies can potentially experience financial troubles or not.**

The two ratios are affected by two similar countervailing factors, namely the percentage of debt to be redenominated α_i and the share of sales or revenues made in France β_i , the magnitude of which should vary across firms and determine whether or not the ratios improve or deteriorate. For each company i , stock of marketable debt B_i , and percentage of devaluation X , the debt coverage ratio in case of a Euro exit is given by:

$$DCR_{i,exit} = \frac{EBITDA_i * (\beta_i + (1 - \beta_i) * \frac{1}{1 - X})}{B_i(\alpha_i + (1 - \alpha_i) * \frac{1}{1 - X})}$$

Hence, the debt coverage ratio should strictly deteriorate if and only if $\alpha_i < \beta_i$, or otherwise if and only if the mismatch indicator is strictly over 1.

Debt coverage ratios (DCR) analysis

The tables below present successively, for the most affected non-financial and financial corporations of the sample, the “mechanical effect” on their respective debt coverage ratios (DCR) resulting from both the redenomination of part of their debt securities and the appreciation of sales or revenues made abroad following the exit and the devaluation of the new currency. For three different scenarios i.e. 20%, 35% and 50% devaluation of the “new” French franc against the Euro, results are the following:

	Debt coverage ratio (DCR)	20% devaluation DCR	35% devaluation DCR	50% devaluation DCR
Numericable	5,3%	4,3%	3,5%	2,7%
Unibail-Rodamco	11,3%	10,3%	9,5%	8,8%
Renault	12,8%	12,5%	12,2%	12,0%
Veolia	17,9%	17,3%	16,9%	16,3%
PSA	22,3%	22,0%	21,8%	21,6%
EDF	24,2%	22,6%	21,2%	19,7%
SNCF	28,8%	23,1%	18,7%	14,4%
Wendel	30,1%	29,9%	29,7%	29,5%
Lafarge	31,7%	31,3%	30,9%	30,6%
ADP	35,0%	34,0%	32,9%	31,2%
Arcelor-Mittal	36,7%	36,2%	35,9%	35,6%
Carrefour	39,4%	35,7%	33,0%	30,3%
Orange	39,5%	35,1%	31,7%	28,3%
Saint-Gobain	47,9%	46,6%	45,5%	44,5%
Sodexo	61,8%	60,0%	58,6%	57,2%
TOTAL	93,5%	89,2%	86,0%	82,8%
Thales	101,1%	95,2%	90,8%	86,3%
Airbus	119,6%	117,7%	116,3%	114,9%
Bolloré	184,0%	179,6%	175,8%	171,6%
Source: Bloomberg, Boursorama, annual reports				
Note: DCR = EBITDA / Marketable debt				

	Debt coverage ratio (DCR)	20% devaluation DCR	35% devaluation DCR	50% devaluation DCR
Société Générale	2,7%	2,5%	2,4%	2,2%
Crédit Agricole	3,0%	2,9%	2,8%	2,7%
HSBC France	4,3%	3,7%	3,2%	2,7%
CIC-CM	5,4%	4,9%	4,5%	4,1%
BPCE	5,9%	5,5%	5,1%	4,6%
Exane	6,3%	5,6%	5,0%	4,3%
BNP Paribas	8,1%	7,8%	7,6%	7,3%
Banque Postale	20,2%	18,8%	17,4%	15,6%
Scor	42,5%	42,1%	41,7%	41,3%
Caisse des dépôts (CDC)	58,3%	53,7%	49,2%	43,4%
AXA	121,5%	120,4%	119,5%	118,5%
Source: Bloomberg, Boursorama, annual reports				
Note: DCR = EBITDA / Marketable debt				

the geographical breakdown of EBITDA. Thus, when not available, we assume the geographical breakdown of EBITDA is the same as the geographical breakdown of sales for non-financial corporations or revenues for financial corporations.

As highlighted in the tables, exiting the Euro would mechanically trigger a significant deterioration of the most strategic companies' debt coverage ratios (DCR). Given the large exposure of the French banking sector to foreign-law denominated liabilities, an exit from the Eurozone is likely to result in a credit crunch and a related drop in investment in the real economy.

Debt service coverage ratios (DSCR) analysis

Moreover, considering the debt service coverage ratio (DSCR) provides a valuable measure of the risk of entering into debt distress situations in the short run. When calculating the variations in the debt service coverage ratios (DSCR) between the baseline situation where France remains in the Eurozone and the situation where it leaves the Eurozone, we still find large negative variations for the most exposed strategic companies (see table in Appendix).

3. An evaluation of the exit cost

One way of measuring the financial cost of the exit on the private sector in the short run comes to wondering how much keeping constant the debt service coverage ratios of the negatively affected companies would cost.

However, one should note that some companies would experience large increases in their debt service coverage ratios (see tables in Appendix for further details). But we do not believe in the relevance of the cost-benefit analysis at the aggregated level. **Negative impacts on strategic firms such as SNCF, Orange or Carrefour, or on systemic banking groups such as Société Générale, BPCE or CIC-Crédit Mutuel would indeed trigger costly adjustments with extremely harmful negative externalities on the whole economy.** This is the reason why the “real” financial cost of exiting the Euro in the short-run would be the cost of safeguarding those negatively affected companies.

So, suppose that in the context of a unilateral exit from the Eurozone, the French authorities want to keep constant the debt service coverage ratios of the French companies facing a negative mismatch (as identified above) on their consolidated balance sheets. For each company j belonging to the subset J of companies with a negative mismatch, the authorities implement a transfer Y_j to keep the DSCR constant. Let us denote $DSCR_{j,1}$ the DSCR at the time of the Euro exit for company j and $DSCR_{j,2}$ the DSCR that would have mechanically prevailed for company j absent of any State intervention. The amount of the transfer to be granted by the State to company j is then given by:

$$Y_j = B_j * (\alpha_j + (1 - \alpha_j) * \frac{1}{1 - X}) * (DSCR_{j,1} - DSCR_{j,2})$$

And the cost of the Euro exit Y_J is finally:

$$Y_J = \sum_{j \in J} Y_j$$

Using our database:

	Cost of exit (20% devaluation)	Cost of exit (35% devaluation)	Cost of exit (50% devaluation)
SNCF	980 000 000€	2 110 769 231€	3 920 000 000€
Numericable	211 050 000€	454 569 231€	844 200 000€
ADP	265 586 104€	572 031 608€	1 062 344 414€
Orange	2 613 413 587€	5 628 890 803€	10 453 654 348€
Unibail-Rodamco	248 418 365€	535 054 940€	993 673 461€
Carrefour	587 146 885€	1 264 624 059€	2 348 587 538€
Veolia	230 037 068€	495 464 454€	920 148 272€
EDF	2 011 065 979€	4 331 526 723€	8 044 263 914€
Thales	144 485 716€	311 200 003€	577 942 863€
PSA	188 250 574€	405 462 774€	753 002 294€
Wendel	91 480 893€	197 035 770€	365 923 572€
TOTAL	2 360 631 425€	5 084 436 916€	9 442 525 701€
Saint-Gobain	300 335 276€	646 875 980€	1 201 341 105€
Bolloré	53 360 754€	114 930 855€	213 443 017€
Sodexo	64 260 000€	138 406 154€	257 040 000€
Michelin	116 683 369€	251 318 026€	466 733 477€
Airbus	125 114 545€	269 477 482€	500 458 181€
Lafarge	75 999 000€	163 690 154€	303 996 000€
Sanofi	256 161 866€	551 733 249€	1 024 647 462€
Arcelor-Mittal	108 486 000€	233 662 154€	433 944 000€
<i>All non-financial corporations</i>	11 031 967 405€	23 761 160 565€	44 127 869 621€
HSBC France	96 077 263€	206 935 642€	323 110 575€
Banque Postale	153 877 159€	331 427 726€	615 508 634€
CIC-CM	844 022 995€	1 817 895 681€	3 376 091 980€
BPCE	1 289 647 077€	2 777 701 396€	5 158 588 307€
CIF	1 431 903€	3 084 099€	5 727 612€
Caisse des dépôts (CDC)	472 422 040€	1 017 524 393€	1 889 688 158€
Crédit Agricole	523 169 687€	1 126 827 018€	2 092 678 749€
Société Générale	612 979 962€	1 320 264 534€	2 451 919 849€
BNP Paribas	1 104 288 732€	2 378 468 038€	4 417 154 928€
Exane	4 149 836€	8 938 108€	16 599 343€
AXA	1 391 478 325€	2 997 030 239€	5 565 913 300€
Scor	3 512 262€	7 564 872€	14 049 048€
<i>All financial corporations</i>	6 497 057 240€	13 993 661 747€	25 927 030 484€
All companies	17 529 024 645€	37 754 822 312€	70 054 900 104€

Source: Bloomberg, Boursorama, annual reports, own computations

As shown in the table, the immediate financial cost of exiting the Euro would be very substantial if the French authorities were to decide to cover the expected losses on exposed companies in order to avoid a sharp contraction of the economy in the event of strategic firms or systemic banks were to face solvency, liquidity or lending problems. Hence, to avoid any drop in the debt service coverage ratios of the main French companies, the French State should inject some given amount of cash to exposed companies.

The cost of this transfer would ultimately rely on the magnitude of the devaluation percentage against the Euro of the newly introduced currency. In case of short-term exchange rate overshooting à la Dornbusch (1976), the “new” French franc may devalue up to 35-50% against the Euro before readjusting towards its equilibrium value around 15-25% (15% being for instance the devaluation percentage needed to correct the gap in unit labor costs accumulated over Germany since the introduction of the Euro - see appendix below). In such an overshooting scenario, the cash transfer to be immediately implemented would amount up to €70 billion. In theory, the authorities could finance the cash transfer from a special tax on positively affected companies. However, we have serious doubts on the technical, political and legal feasibility of such a scheme. **On the basis of the previous results, the view is that, at least in the short run, a Euro exit is most likely to have a negative impact on French companies whose market-based financing relies on foreign-law issues to fund domestic activities.**

4. Implicit State guarantees and banks’ bail-ins

As to whether or not the government would implement such cash transfers to keep constant the debt coverage ratios of the most affected biggest French companies, many factors would be at work such as how smoothly the unilateral exit process would run, how stressed the economic agents and financial markets would be etc. **Obviously, systemic institutions, companies with implicit state guarantee and State-owned enterprises would be targeted first.**

Assuming that only companies where the State holds a significant amount of shares (more than 10% of total shares) would be bailed-out, the total cash transfer to be implemented would account for approximately 57% of the total “exit cost” previously calculated for non-financial corporations (see Appendix). **However, one cannot exclude that other big strategic non-financial corporations such as TOTAL, Saint-Gobain or Veolia would also have to be immediately bailed-out to avoid large negative externalities on the whole economy.**

As for banks and other systemic financial institutions (e.g. AXA), bail-ins may be designed to protect French taxpayers and internalize the costs of the exit by imposing losses on bondholders depending on their seniority (junior debt being targeted before senior debt for instance). **Nevertheless, a bail-in would mean imposing losses resulting from a political decision on international investors, incurring a huge reputational risk for the French authorities and the French banking system as a whole.** Hence, one cannot exclude that a bail-in of the banking system following a unilateral exit from the Eurozone would have extremely negative outcomes for the French economy. **A bail-in being thus considered as too risky, systemic financial corporations would most probably be bailed-out by the government³⁴.**

VII. TOWARDS A FULL BALANCE SHEET ASSESSMENT

One of the main limitations of our study is that it does not focus on the total financial debt, but only on the marketable debt of the selected companies, leaving bank loans (i.e. liabilities to banks) and maybe some other parts of the financial debt aside. Clearly, including bank loans and other missing debt securities in the analysis in order to deal with the total financial debt of the selected companies is an area for further research.

With relevant data, one may try to take into account the total financial debts versus the total financial assets, and perform full balance sheet analyses at the Group consolidated level. However, due to limited data, we restricted the analysis to the marketable debt and proxied the asset side’s structure of the selected companies with the geographical breakdown of sales and revenues. Dealing with bank loans for instance is a complex task as we lack available information regarding the applicable laws to the contracts. There exists no database centralizing information like the one we used to build the database on the marketable debt of the selected companies. In what follows, we first provide an estimation of the amount of bank loans and other missing debt securities among the selected firms’ financial debts, and then display two methods to estimate the share of bank loans under French law.

Whether or not bank loans and other missing debt securities matter and may change significantly the previous results, indeed depend on (i) their share among the total financial debt, and (ii) the percentage of these liabilities under French law.

1. Share of marketable debt among total financial debt

To address the first issue, we used the selected companies’ annual reports, just as we did before to gather information on their annual incomes and revenues. We define financial debt as the sum of “current” and “not-current financial debts” for non-financial corporations, and of “debts represented by a security” and “debts to credit institutions” for financial corporations³⁵. **On the basis of these data, we merged both databases to derive the percentage of the total financial debt covered by the marketable debt obtained on the Bloomberg terminal.** The “residual financial debt”, computed by subtracting

³⁴ Financial institutions being on average “more systemic” than non-financial corporations, the bail-out of the financial sector is likely to be more wide-reaching. Recent experience (2012) shows that even rather “small” financial institutions such as the Crédit Immobilier de France (CIF) had to be bailed-out when facing significant financial stress.

³⁵ The definition of financial debt for financial corporations may be subject to debate but we chose to include interbank loans to have the broadest definition of financial debt possible, so as not to overestimate the ratio of marketable debt over total financial debt.

“marketable debt” from “financial debt” is a mix of bank loans and other debt securities not listed on the Bloomberg Terminal like specific money market instruments³⁶.

To summarize, our database covers 73% of the total financial debt of the selected non-financial corporations and 54% of the total financial debt of the selected financial corporations (complete results for both non-financial and financial corporations can be found in Appendix).

In light of these findings, we can conclude that the results should not be too sensitive to the introduction of the residual financial debt for at least two-thirds of the affected companies for which the share of the residual financial debt is under 30% of the total financial debt³⁷.

2. Percentage of the residual financial debt under French law

Could these loans or other missing debt securities be redenominated? Even if it is impossible to address *a priori* the question of whether or not the residual financial debt is relatively more under French law than the total debt securities included in the database, one may try to find a proxy for the percentage of bank loans under French law on the liability side of the selected companies.

In order to do so we assume the country of residence of both parties involved is a good proxy for the governing law of a given bank or interbank loan, so that cross-border bank or interbank loans (i.e. involving one party whose country of operation is France and another party whose country of operation is not France) are under foreign law and domestic bank or interbank loans (i.e. involving two parties whose country of operation is France) are under French law. Credit institutions report in their annual reports the geographical breakdown of their gross credit risk exposure by instruments and counterparties. For the seven major credit institutions residing in France (all are included in the sample), figures for loans and receivables due from customers are the following:

	Loans and receivables due from customers	of which in France	of which to non-financial corporations
CIC-CM	248 862 000 000€	90%	20%
Crédit Agricole	301 100 000 000€	42%	32%
BNPP	617 161 000 000€	66%	44%
SocGen	333 500 000 000€	47%	39%
BPCE	578 419 000 000€	66%	27%
HSBC France	45 161 000 000€	80%	46%
Banque Postale	59 212 535 000€	88%	9%
All	2 183 415 535 000€	62%	33%
<i>Source: annual reports</i>			

The breakdown reveals that, on average, French banks make 62% of their bank loans in France, while 33% of total bank loans are made to non-financial corporations, bringing approximately 20% of bank loans made to non-financial corporations residing in France if one assumes that the percentage of loans in France is the same for all types of counterparties (households, NFCs etc.). We used the total amount of bank loans made to non-financial corporations residing in France as of August 2014 provided by the French national central bank (“Banque de France”), and subtract from this figure the amount of bank loans made to non-financial corporations residing in France by the major French banks identified above. Thus, the residual allows us to compute the share of bank loans made to non-financial corporations residing in France by foreign banks expressed as a percentage of total bank loans, i.e. the percentage of bank loans under foreign law. Results are the following:

Bank loans to French NFCs (residents) made by French banks	Total bank loans to French NFCs (residents)	% of bank loans to be redenominated
450 000 250 972€	825 200 000 000€	54,5%

Source: Banque de France, annual reports

³⁶ The French national central bank which monitors and regulates the French money market instruments (“titres de créances négociables”) explains that around 60% of money market instruments’ issuances have a maturity inferior to three days and are therefore not listed on market databases like Bloomberg (https://www.banque-france.fr/uploads/tx_bdfgrandesdates/Focus_8_FR.pdf, p8).

³⁷ Out of the 32 exposed companies, 20 have shares of residual financial debt under 30%. The 20 companies are: EDF, SNCF, Orange, Carrefour, Unibail-Rodamco, Saint-Gobain, Arcelor-Mittal, Sanofi, Veolia, Lafarge, Numericable, Wendel, Thales, Sodexo, ADP, Société Générale, HSBC France, CIF, AXA and Scor (see Appendix for further details).

Under this method, the average percentage of bank loans to French non-financial corporations to be redenominated would be 55%. One must be aware that there are two shortcomings in the reasoning in addition to relying on a specific assumption to determine the governing law: (i) the percentage obtained is an average for all non-financial corporations regardless the size and the internationalization degree of the firm, and (ii) the counterparties of bank loans are non-financial corporations residing in France and not non-financial corporations of French nationality including foreign affiliates. It may be the case that the most internationalized French non-financial corporations - otherwise the ones we selected to build the database - borrow more from foreign banks, in particular through their foreign affiliates, so that the percentage of bank loans to be redenominated may be overestimated providing the assumption used to determine the governing law of bank loans is correct.

Another method to obtain an estimation of the percentage of bank loans under French law involves using the share of bank loans made to the “biggest firms” found in CIC-Crédit Mutuel’s annual report³⁸, 2%, and assuming (i) that this figure applies to all other major French credit institutions, and (ii) that we have in the sample all French “biggest firms”. Taking the sum of the residual financial debt (*a priori* close to the sum of bank loans) derived previously for the non-financial corporations, and subtracting the total amount of bank loans made by the major French banks calculated before, I found another estimated value of the percentage of bank loans under French law:

Bank loans to the biggest French NFCs made by French banks	Bank loans of the biggest French NFCs	% of bank loans to be redenominated
43 668 310 700€	155 098 544 652€	28,2%

Source: Bloomberg, annual reports

Note: “bank loans of the biggest French NFCs” is actually the residual financial debt calculated previously

Under this other method, the percentage of bank loans to be redenominated seems much smaller: around 28%. Again, there are significant shortcomings with this method, which, contrary to the previous one, may lead to underestimating the percentage of bank loans to be redenominated. Indeed, it may be that, first, some French banks devote more than 2% of their loans to the “biggest firms”, so that the amount of bank loans made by the major French banks to the 48 French non-financial corporations is actually higher than the one displayed in the table above, and second, what is called the “biggest firms” in CIC-CM’s annual report encompasses less firms than the 48 we selected to build the database (if for instance CIC-CM calls “biggest firms” CAC40-non-financial corporations). Finally, considering that the residual financial debt calculated previously using annual reports and Bloomberg data is equal to the sum of bank loans held by the 62 companies means for sure overestimating the share of bank loans³⁹. Therefore, using two different methods, we have obtained an interval where the true value of bank loans to be redenominated in the sample most likely lies (between 28% and 55%).

Finally, because (i) the percentage of bank loans among the total financial debt is much smaller than the percentage of marketable debt, and (ii) the percentages of bank loans and marketable debt under French law may be relatively close in the sample, adding the bank loans to the analysis should not have a significant impact on our main findings.

VIII. HISTORICAL STUDIES – WHY THIS TIME IS DIFFERENT

Hence, by exploring the balance sheets of some major French firms, we have shown that the issue of redenomination of the private debt could be a major drag on any attempt to exit smoothly from the Eurozone. At this point of the study, one might reasonably wonder how other nations dealt with that problem in the past.

Examples of currency redenomination in circumstances similar to what a “Euro exit” could be are hard to find. Fixed exchange rates are common features of international monetary policies, and so are

³⁸ p74 of the 2013 CIC-CM annual report.

³⁹ The residual financial debt also includes other debt securities absent from marketable debt data. Thus, the €155bn figure of “bank loans of the biggest French NFCs” is for sure overestimated.

issues of how to switch to more flexible regimes. However, the specificity of the Eurozone is that it is a common currency, which means that the prospects of redenomination are most of the time disregarded by economic agents and that the juridical uncertainty such a process could entail is of the highest level. Put differently, to find historical examples for which the comparison makes sense, we need to focus on cases where countries shared a common currency, or at least where foreign and domestic currencies were considered as close substitutes, and a demise of the system highly unlikely. Though none of them is related to the particular question of the *lex monetae*, it is a useful reminder that redenomination is always a tricky issue and that the examples that are put forward to advocate a Euro exit are precisely those where, due to particular conditions, this very issue was not raised.

We start by considering the most recent example of such a situation, namely the economic and financial crises that devastated Argentina in 2002. We then go back in time to address two cases often discussed – the “Velvet Divorce” of Czechoslovakia in 1992-93 and the exits from the Gold Standard – to show that the smooth process through which they abandoned their old regimes owes much to particularities of their economies we cannot see today in the Eurozone.

1. Argentina, a season in hell

Argentina provides us with a striking example of a country where the redenomination process in 2002 was both hazardous and disastrous.

From 1991 to 2002, Argentina lived under the regime of the “Currency Board”. It basically meant that Argentina gave up its powers in the field of monetary policy. The Central Bank guaranteed unlimited conversions of pesos to U.S. dollars, at the rate of 1:1, and therefore backed each peso coin and bill in circulation by U.S. dollars in foreign reserves. Hence, pesos and U.S. dollars were indiscriminately used as means of payments, reserves of value and units of account. For instance, many savings accounts owned by Argentina residents in Argentine banks were denominated in U.S. dollars.

Faced with a long-run deterioration of competitiveness as well as with short-term shocks - such as the depreciation of the Euro against the U.S. dollar and the turmoil in international lending markets in the wake of the Asian crisis - Argentina came under a severe economic crisis starting in 1999. In 2001, it became unable to finance its current account deficit and sustain the Currency Board. It defaulted on its external public debt while engineering a devaluation of the Peso. **The main questions of interest were: what was to be done with the enormous amounts of dollar-denominated or dollar-indexed financial contracts? And how could debtors whose revenues were denominated in depreciated pesos pay them back? Let us notice that the questions are very similar to those we have raised before.**

The issue of debt redenomination in the wake of a devaluation was already well-known and examples were drawn from the Mexican and Asian crises of 1995 and 1997. An example often referred to was also the repudiation of the “gold clauses” by the Roosevelt Administration when the United States exited the Gold Standard in 1933⁴⁰. Hence, from 2000 onwards, while the Currency Board seemed to be doomed, Argentine banks, and especially foreign ones, opposed devaluation and advocated dollarization to avoid financial losses, while the overall majority of producers stood up for pesification and devaluation, to reduce their indebtedness and boost their competitiveness. The former eventually gave up to the latter and the government when it became obvious that, barring pesification, the increase in non-performing loans would be dramatic (Calvo, 2008). The government decided first to pesify only bank debts up to US\$100,000. Both banks and firms warned against the currency mismatch dangers for huge debtors.

Hence, on February 3rd, the government embarked on a process of full pesification of debts at an exchange rate of 1:1, while deposits were converted at an exchange rate of 1.4 pesos per U.S. dollar, and

⁴⁰ “Gold clauses” enshrined in debt contracts indexed repayments on the price of gold. Though the latter was supposedly fixed under the “Gold Standard”, it was seen as a precautionary measure against potential debasement. They were repealed by the Roosevelt Administration in June 1933 in the wake of its decision to exit the “Gold Standard”. Challenges were taken to Court, but the Supreme Court eventually ruled them out in January 1934 and vindicated the government policy.

decreed a floating-exchange rate regime. This became known as “asymmetric pesification”. The rationales behind this strange scheme were often assessed in lying in purely political motives, the Argentine Congress trying to preserve the support of the Argentine middle-class, whose savings mostly consisted in dollar-indexed bank accounts. Others have pointed toward the subsidies provided to the entrepreneurs and to the debtors aimed at sustaining private investment.

We would like to add to this the erroneous assessments of the gravity of the situation made by the government. It largely overstated its ability to transfer resources from devaluation’s winners to losers. It had indeed designed a bail-out plan for the banks that relied heavily on emergency taxes on exporters, whose incomes were denominated in U.S. dollars. But it proved impossible to levy. While a tax on oil exports was part of the Law of Public Emergency passed on January 6th, 2002, it caused such an outcry among oil companies that their lobbying resulted in an almost complete repeal of these provisions. Moreover, the Argentine government wrongly assessed at US\$6 billion the cost of the asymmetric pesification, with a devaluation of the peso expected to be kept at 40% (Calvo, 2008). **What could have been a clever way of providing fiscal support for a distressed economy turned out to be a financial disaster.** Until at least 2004, nobody knew at what price the government bonds, issued to balance the banks’ balance sheets (the “so-called” BODEN) should be valued. Not only were they illiquid, but the still unsettled question of the Argentine default led to serious doubts concerning the ability of the government to keep its word (*The Economist*, 5 June 2004). **Hence, while public credibility was remaining highly questionable after the December default, this “bail out” consisted primarily in an administrative trick to keep insolvent banks opened.**

The Supreme Court first tried in March 2003 to challenge the pesification, basing its argument on the Article 17 of the Constitution that stipulates the right of individuals to dispose freely of their assets. However, and after some justices were dismissed by Congress, it was overturned in October 2004. This landmark decision once and for all vindicated the pesification. But in the meantime, US\$2.9 billion had been reimbursed by banks to their creditors on warrant of the courts⁴¹.

As regards firms, Calomiris (2006) showed that the devaluation boosted in 2002-03 the investment of Argentine tradable firms, without noticeable difference between the high dollar-indebted and low-dollar indebted ones prior to the redenomination. Comparing with the 1995 Mexican crisis, where the latter performed much better than the former, he pleads for a redenomination-cum-devaluation management of balance of payments crisis.

But as regards the banking system, the exit of the peg as well as public default were undoubtedly disastrous, bringing it on the verge of insolvency and resulting in an almost total credit freeze for a year. Banks in Argentina were indeed assumed to be in 2001 in a relatively strong position, concerning usual requirements. However, they suffered from two massive liabilities: their exposure to sovereign debt and to unhedged redenomination risk (IMF Staff Paper 2007). By September 2001, 70% of bank liabilities were denominated in U.S. dollars, with a net foreign currency position of +7.6%, and government bonds stood for 10% of the banking assets. They were affected at the same time by a liquidity shock (the “bank runs” that started in March 2001 and the sudden stops of foreign lending), a haircut on government bonds (a swap in November 2001, and then the pesification of public debt in February at a rate of 1.4:1) and the asymmetric pesification.

The asymmetric pesification led to a decrease of the banking sector’s net wealth by US\$16 billion (Miller, Fronti, Zhang 2004), which went from US\$15.8 to US\$-0.78 billion. Hence, asymmetric pesification itself was enough to destroy banks’ wealth. If we add to this the collapse of the market value of government bonds, which resulted in roughly equivalent losses (Gutierrez, Montes-Negret, 2004), we understand that the banking sector’s wealth was totally wiped out.

⁴¹ According to the BCRA, quoted in <http://en.mercopress.com/2004/10/27/argentine-high-court-upholds-pesification>.

The liquidity shock was dealt with the maintenance of the *corralito*⁴² as well as with the extension of credit facilities by the Central Bank of Argentina to make up for the loopholes in the freezing of accounts (estimated by the “Superintendency of banks” to represent US\$4.2 billion per month for the first quarter of 2002), until confidence came back and deposits started rising again in September 2002. Note that the *corralito* also significantly blocked intra-bank payments, to protect the most fragile companies, thereby further crippling the functioning of the payments system. During year 2002, banking credit to the domestic sector virtually amounted to zero, with real interest rates set at 16.2% and nominal lending interest rates at 51.7% (World Bank). It started to recover in 2003 (with real interest rates of 7.3%).

Hence, we can see clearly here how huge redenomination problems resulted in a disastrous paralysis of the banking system for a whole year in Argentina.

Moreover, defaults on external debt prevented Argentine export firms from accessing trade credits that would have allowed the country to take advantage of the price-competitiveness the devaluation of the Peso had boosted. J-curve behavior, that is a surge in import prices unmatched by a similar rise in exports volume, often observed in the wake of devaluation, was then particularly sharp. And the conjunction of sovereign and banking crises made the former unable to provide the help the financial system would have precisely needed – on the contrary, the fall in government bonds’ prices further weakened its solvency.

Eventually, panic arising from a “leap in the dark” feeling can fuel both internal bank runs and external sudden stops. Argentina is undoubtedly an extreme example. But it delivers a gloomy picture of how bad a situation can turn when sovereign debt crisis, external imbalances and banking distress converge to the point where they all burst simultaneously, in the midst of an exit from a currency peg.

The first lesson we can draw for the Eurozone is that a Government should not overestimate its ability to bail out the banking system in case of an exit, especially when its public finances are already stressed and that exiting the currency peg might only reinforce foreign investors’ distrust. The second lesson, which is consistent with the bulk of literature on “dollarization”, is that the redenomination process has to be both comprehensive and at a same rate of exchange to avoid destabilizing balance-sheet-effects. Of course, choosing an “asymmetric pesification” seems with hindsight to have been an odd choice. But it underlines the political economy dynamics, as well as the forecast mistakes, that make such transfers of wealth highly risky and uncertain, which is our third lesson from the Argentine experience.

2. Czechoslovakia: a velvet divorce

An often quoted example of an orderly break-up of currency union is the one between the Czech and Slovaks that took place in 1992 and 1993. However, we argue that very specific features of Czechoslovakia - most of all financial solidarity between the two countries - account for the success in dealing with redenomination problems.

The “Velvet Divorce” example is widely used in the public debate on Eurozone break-up⁴³ for reasons easy to summarize: (i) like the Eurozone, Czechoslovakia did not form an “Optimum Currency Area”, since Slovakia was often referred to as burdened with a less competitive industry that required an important devaluation and less profitable State-owned firms that demanded a smoother transition to capitalism and a more “laxist” monetary policy, (ii) like the European Union, Czech and Slovaks disregarded the budgetary transfers and the mutual compromises that could sustain this common currency, (iii) the preparation of the monetary break-up paved the way for a swift and successful implementation of new national currencies, without any sign of panic or major technical problems, and

⁴² The “corralito” is the name usually given to the measures taken by the Argentine government from December 2001 to Fall 2002 aimed at stopping the bank runs that had started in 2002 and were endangering the whole banking system. They consisted essentially in limits put to the amount of funds that could be withdrawn during a given week from a given account.

⁴³ Bootle, Roger, “Leaving the euro: a practical guide”, Capital Economics, 2012.

finally (iv) the economic growth that followed in both countries as soon as 1994, the peaceful diplomatic relationships between the two nations after their divorce and the political stability in both entities could serve as a counterpoint to those who prophesize disaster in case of a Euro exit.

However, we hold that this smooth transition could not be that easily managed within the Eurozone. The “Velvet Divorce” achievement was grounded in very particular economic conditions of Czechoslovakia. We first start with a brief summary of the separation, before analyzing the factors behind its success.

In February 1992, two distinctive currencies were established and in July, the Slovak crown was devalued by 10% against the Czech crown. Though recessions hit hard in 1993 (GDP indeed decreased by 1% in the Czech Republic and by 4% in Slovakia, according to the OECD (1994)), the magnitude of the trade collapse between the two Republics (-20% in 1993) was probably mitigated by the preservation of a customs union. Moreover, it is difficult to deal with the specific shocks related to the disappearance of the common currency and the more general troubles most economies went through during their transition periods. Since Czechoslovakia avoided currency, financial and banking crises, we can think of it as a successful operation. Concerning sovereign debt, its pretty low level protected it from speculative attacks: in 1992, it only amounted to 20% of Czechoslovakia's GDP. In 1993, the Slovak governments kept on running public deficits as high as 5% of GDP without incurring serious stress on its debt interests. **But how come that the amount of “foreign debt”, in the sense of debts owed by Slovaks to Czech and vice-versa, did not raise concerns in an economy that was financially integrated for such a long time?**

The most important fact we would like to highlight is that, through an elaborate financial system, the Czech managed to subsidize to a large extent the Slovak Republic during 1993. Strangely enough, to our knowledge, no one has laid the stress on this aspect we deem crucial to account for the success of this separation. First, one should remember that there were no “financial systems” to really speak of in Czechoslovakia. Or, more precisely, that it was solely made up of the public banking system, through which all foreign exchange transactions and capital transfers were channeled. It simplified considerably the management of the transition. A “clearing system” was put in place, the details of which can be found Smidkova (1995). Though this scheme, when a Czech had lent one Czechoslovakian crown to a Slovak, the creditor was receiving one Czech crown while the debtor was only paying one Slovak crown. Therefore, the redenomination process could not trigger any negative balance sheet effects on the private sector. The difference between the value of Czech and Slovak crowns was in the end at the expense of the Czech government. In the year of transition (1993), Prague thus transferred to Bratislava the equivalent of 2.6% of 1993 Slovak GDP.

It is no wonder that such a financial transfer was politically feasible at that time. First, the Czech and the Slovak had not separated primarily on “economic reasons” but rather on political grounds. Contrary to the Eurozone, they did not consider divorcing in the midst of an economic crisis. There was no popular constraint, nor sustainability imperatives, on cutting immediately the financial support. On the contrary, transfers had been made in that direction – though to a smaller extent – ever since 1919. Second, the leaders of the two Republics inherited from the communist era a low level of accountability, a highly regulated banking system and a culture of secrecy that made arrangements such as a clearing system both politically acceptable and technically manageable. Third, the Czech Republic was four time larger than the Slovak one. Neither of these conditions is filled within the Eurozone. And it would be very daring to bet on the Northern countries’ willingness to subsidize their Southern neighbors wishing to leave the Eurozone up to 2.6% of their GDP.

3. Gold Standard: better alone

The “Gold Standard” remains in our memories as the most important monetary failure of the 20th Century. Is the Euro going to be the “Gold Standard” of the 21st Century? The comparison was tempting

on many grounds for many economists and columnists⁴⁴. **However, we show that in both economies used to support such a comparison - the United Kingdom and the United States, the redenomination issue was not relevant. And in the ones where it was (Central and Eastern Europe), the governments decided not to exit the Gold Standard.**

The Gold Standard imposed the famous “Mundell trilemma” on Western economies (O’Rourke and Taylor, 2013). It was indeed impossible at the same time to benefit from fixed exchange rates, free capital mobility, and monetary autonomy. Correcting for the massive international imbalances that had been built in the 1920s required a policy of internal deflation, since the external depreciation of the currency had been made impossible by the fixed exchange rates regime. Hence, lessons should be clearly drawn from that episode for the debt-ridden countries of the Southern European periphery which strive nowadays to make up for the loss of competitiveness they inherited from the “roaring 2000s”.

In their seminal article published in 1986, Barry Eichengreen and Jeffrey Sachs first established a clear positive correlation between early Gold standard exits and economic recoveries. The first countries to get rid of their fetters (as epitomized by the United Kingdom) were first to recover from the Depression. They highlighted the channels through which real exchange rates could have had an impact: (i) the classic “beggar-thy-neighbor” channel: early devaluing countries were able to capture part of other countries’ domestic demands because they sold cheaper, (ii) the real wage effect: devaluing the domestic currency made it easier to decrease labor costs without resorting to a painful nominal wage deflation, always hard to manage given the downward stickiness of these prices, and eventually (iii) the interest rate effect: the Central Bank could run “cheap money policies” without fearing for the stability of its exchange rate.

To this point, a strong case seems to be built to advocate a Euro exit on the basis of the Gold Standard experience during the 1930s. “Core economies” – as epitomized nowadays by Germany – show no willingness to boost the periphery countries’ exports, and the monetary mechanism does not exert any pressure in that sense. Hence, the common currency imposes a deflation channel adjustment for countries in the periphery. There is no doubt that many Southern countries face, beyond this competitiveness problem, an under-optimal domestic demand which cannot be stimulated by monetary growth. Just as the first countries in the 1930s that realized that they could not be crucified on a “cross of gold”, the first ones to get rid of the ideological inertia that binds them to the Euro could be the first to recover.

But the story of the 1930s is not as clear cut. In fact, as most recent research in economic history showed, this “big picture” only concerned some specific countries - the United Kingdom and the United States most of all - which had some special conditions that made the Gold Standard exit easier and successful.

Great Britain had in particular no redenomination problem. The sterling was still at the time the world’s most used currency. When looking at the data provided by Billings and Capie (2011), we can see that the Westminster Bank - one of the “Big Five” along Barclays, Lloyds, Midland and National Provincial - had only 3.78% of its deposits denominated in U.S. dollars. These figures are consistent with the broader ideas we have about the still overwhelmingly dominant role the sterling played as an international currency. And hence, it could on the contrary be argued that by fully allowing the Bank of England to embark on a policy of “cheap money”⁴⁵ the exit from the Gold Standard acted in support of financial and banking stability.

⁴⁴ Eichengreen, Barry and Peter Temin (“Fetters of Gold and Paper”, Oxford Review of Economic Policy, 2010), Peter Coy (« The Euro : As Good (and Bad) as Gold », Bloomberg Business Week, November 17th 2011), Kevin O’Rourke (“The Eurozone needs a history lesson”, The Economist, January 17th 2014).

⁴⁵ The « Gold Standard » imposed conflicting goals to the Central Bank. When faced with an economic crisis, it could theoretically increase monetary supply to boost investment. But on the other hand, it feared that such a move would prompt capital outflows, thereby endangering the fixed exchange rate it was committed to uphold.

The United States had no such problem either. Though we lack data on American foreign currency denominated debt, there are good reasons to believe that this was not so much of an issue. First, the United States were a relatively closed economy with exports amounting for instance for 3.54% of GDP in 1933, which had moreover enjoyed current account surpluses up until 1931. Second, the pound had already been devalued in 1931, so that on average one pound could buy five U.S. dollars in 1934, while it bought 4.75 U.S. dollars prior to September 1931. The effect of this 5% change in exchange rate on the long-maturity debt owned by Americans to British must have been benign. Third, the devaluation of the U.S. dollar had been well anticipated (as the multiple speculative attacks of 1931-1932 showed) and investors were likely hedged against that prospect in 1933.

On the contrary, highly indebted Central European countries embarked on policies of foreign exchange controls and protectionist tariffs, but most of the time refused to alter the nominal value of the currency. Let us focus on Germany, whose policies prior to Adolf Hitler's election provide us with a good example of such attitudes. The reasons why German leaders refused what seems now the obvious solution, i.e. letting the Reichsmark float, have long been discussed. The ideological motives of Chancellor Brüning, such as the belief that money should not be manipulated by governments to influence GDP, as well as the underlying political calculus - if Germany did not seem to be "serious" and to suffer, it could not obtain its most wanted rebate on Reparations - have often been underlined. However, there were also seriously-based fears, pointed out by Harold James (1986), that an expansive monetary policy, a few years after hyperinflation, would fuel distrust towards the German banking system and among foreign creditors, thereby worsening an already tense situation.

Moreover, Germany's foreign debt was huge, ranging between 68 and 75% of GNP in 1928, with the amount of Reparations roughly equal to the amount of commercial debt (Ritschl, 2010). The maturity structure was particularly problematic. Short-term deposits in foreign currency were indeed very important, amounting to 18% of the total deposits in the banking system. Though Schnabel (2004) argues that the currency mismatch *per se* may not have been that much of a danger, with German banks owning important foreign currency-denominated claims on domestic agents, these assets were however mostly long-term ones. Besides, financial institutions were undercapitalized and endowed with very low levels of foreign reserves. **Hence, German banks were very sensitive to any panic arising among foreign lenders because they had a huge currency mismatch problem.**

Germany found itself in the summer of 1931 in a situation that has been well studied for emerging economies (in East Asia for instance in 1997-98). The Reichsbank could provide liquidity to distressed banks, but at the cost of endangering the exchange rate. This would have further reinforced foreign deposits' liquidation and potentially triggered damaging currency-mismatch problems. To this question, we shall add the specific issue of the Reparations. Germany was in no political position to unilaterally default upon. The Hoover moratorium that was held in June was indeed precisely designed to avoid writing-off permanently German international debt (Schuker, 1988).

Though this has not been thoroughly studied until now, our hypothesis is that the fear of a spike in the amount of Reichsmarks required to meet these obligations has played in the reticence of the German government to embark on a risky devaluation. Given the difficulties the government had to balance its budget from 1931 to 1933, it is indeed hardly believable that it could have serviced its foreign debt if the latter had increased in the wake of a devaluation. This is vindicated by evidence that U.S. negotiators had told their German counterparts that foreign-exchange controls were more acceptable than giving up the "gold clauses" of international debt contracts (Ritschl, 2012).

Thus, the German example allowed us to understand how a country which faces the choice of exit under a heavily stressed banking sector, high foreign debt and a currency no one "trusts" may have good reasons to fear it. And that was already the case during the Gold Standard.

IX. CONCLUSION

Contrary to what J. Nordvig and N. Firoozye suggest, this study shows that the main French companies largely borrow under foreign law. We have exhibited evidence that a significant number of key strategic and potentially systemic French Groups would experience large negative balance sheet effects if the political risk of a unilateral French exit from the Eurozone was to materialize. At the Group consolidated level, this is mainly due to the fact that these very companies finance domestic activities by issuing debt securities under foreign law *via* their head offices or foreign affiliates with little or no local activities. The affected companies' consolidated balance sheets therefore present unhedged mismatches, in a similar fashion to those experienced by some Asian emerging economies in the late 1990s, with the only difference that they would be related to the juridical nature of the contracts instead of the currency of issue. Hence, a Euro break-up may trigger a vast currency crisis resulting in costly devaluations and sharp contractions of domestic outputs in the Eurozone. This is why the comparison with Asian emerging economies of the late 1990s is probably not meaningless.

This is by no means a new feature of monetary unions. The redenomination problem is always tricky. As we have shown in our historical inquiry, it accounts for a major part of the Argentine meltdown in 2002. Conversely, the success of the "velvet divorce" in Czechoslovakia was considerably helped by the financial support provided by the Czech Republic to the Slovak Republic to deal with the "legacy debt" contracted before the separation. And the "Gold Standard exit" was fruitful precisely where redenomination was, due to the structure of indebtedness, no issue. On the contrary, where it was, "Gold Standard exit" was precisely averted. Hence, our study reminds us of the fact that important redenomination problems can well explain success or failures of monetary regimes' switch.

In France, the fundamental problem lies in the excessive recourse to foreign-law debt issues to be paid with domestic income streams. The Euro being regarded as irreversible, this resulted in inadequate incentives to hedge against foreign-law exposures on euro-denominated debt securities. What should be done then? In the future, to diminish the exposure of its firms to a Euro break-up, France would obviously gain from further developing its domestic bond markets in the wake of the recent Paris Europlace initiatives. Special emphasis should be given to reinforce French-law debt issuances in order to better monitor any mismatch that could arise in a Eurozone break-up scenario for companies excessively relying on foreign-law issues. In this context, the French authorities should adopt a clear long-term objective to reduce bond issues under foreign law, and greatly restrict foreign-law debt issues of State-owned companies (e.g. SNCF).

And, as French systemic banks were reported to be particularly exposed to a Euro exit and for the sake of improving risk management, European authorities would probably gain from modifying the regulatory regime operating on banks for foreign-law debt securities when banks start financing a disproportionate share of domestic activities with foreign-law issues.

But public authorities may face a dilemma. The measures previously mentioned would take years to be implemented by the usual mechanisms of incentives and soft regulation. In the long run, the question of Euro exit might be less relevant, either because the current crisis would have been overcome, or because the common currency would no longer exist. But speeding up the process of French-law debt issuances might trigger speculations on the future of the common currency and/or create an incentive to break-up from the Eurozone, thereby causing the very financial crisis it was precisely designed to prevent.

All this points to the fact that the Eurozone is still an incomplete currency area from a legal point of view. Even if promoting the Paris financial center to indirectly reinforce debt issues under domestic (French) law may appear as an optimal policy choice from a national perspective in the short-run, it is first and foremost essential to promote better legal and financial coordination between Member States of the Eurozone. In that perspective, the Member States could implement appropriate legal reforms of the European law to give European companies the opportunity to issue debt securities under a unified "EU

governing law”. Indeed, in its “Green Paper on the feasibility of introducing Stability Bonds”⁴⁶, the European Commission itself underlined (§ 4.1.3 “Legal regime governing issuance”): “Currently, government bonds are issued under domestic law. For international bond issuances, English law or, if the US market is targeted, New York law is often used. An equivalent EU law under which Stability Bonds could be issued, does not exist”. This workshop of European law reform to issue private debt securities under a unified “EU governing law” would be a step towards further integration of the Eurozone and a prerequisite to potential future issuances of “Eurobonds” (issued jointly by the 18 Member States)⁴⁷.

REFERENCES

- Aghion, P., P. Bacchetta and A. Banerjee. 2001. “Currency Crises and Monetary Policy in an Economy with Credit Constraints.” *European Economic Review* 45(7): 1121-50.
- Allayannis, G., G. Brown and L. Klapper. 2001. “Exchange Risk Management: Evidence from East Asia.” Policy Research Working Paper 2606. Washington, DC, United States: World Bank.
- Athanassiou, P., “Withdrawal and expulsion from the EU and the EMU : some reflections”, ECB, Legal working paper series n°10, 2009.
- Bleakley, H., and K. Cowan. 2002. “Dollar Debt and Devaluations: Much Ado About Nothing?” Working Paper 02-5. Boston, United States: Federal Reserve Bank of Boston.
- Billings, M. and Forrest C., 2011, “Financial Crisis, Contagion, and the British Banking System between the World Wars”, *Business History*, 53.
- Calomiris, C., 2006, “Devaluation with Contract Redenomination in Argentina”, National Bureau of Economic Research.
- Calvo, D., 2008, “State and Predominant Socioeconomic Actors: the Asymmetric Pesification in Argentina 2001-2002”, Stockholm Papers in Latin American Studies, Issue 4.
- Capstaff, J., and A. Marshall. 2007. “The Introduction of the Euro and Derivative Use in French Firms.” *Journal of International Financial Management and Accounting* 18:1 2007.
- Céspedes, L.F. 2004. “Financial Frictions and Real Devaluations.” Santiago, Chile: Central Bank of Chile. Mimeographed document.
- Céspedes, L.F., R. Chang and A. Velasco. 2000. “Balance Sheets and Exchange Rate Policy.” NBER Working Paper 7840. Cambridge, United States: National Bureau of Economic Research.
- Chang, R., and A. Velasco. 2001. “A Model of Financial Crises in Emerging Markets.” *The Quarterly Journal of Economics*.
- Chung, K., J-E Lee, E. Loukoianova, H. Park, and H. S. Shin. 2014. “Global Liquidity Through the Lens of Monetary Aggregates.”, IMF, Working Paper No. 14/9.
- Cowan, K., H. Erwin and L. O. Herrera. 2005. “Currency Mismatches, Balance-Sheet Effects and Hedging in Chilean Non-Financial Corporations.” Research Department Working Paper #521. Inter-American Development Bank, Felipe Herrera Library.

⁴⁶ http://ec.europa.eu/europe2020/pdf/green_paper_en.pdf

⁴⁷ Without going into specifics, note that that this would probably require reviewing European law and expanding the jurisdiction of the Court of Justice of the European Union.

Dedek, O. et al., 1996, "The Break-up of Czechoslovakia : An In-Depth Economic Analysis", Avebury, Aldershot.

Döhring, B., 2008. "Hedging and Invoicing Strategies to Reduce Exchange Rate Exposure: a Euro-Area Perspective." Economic Papers 299, January 2008. Directorate-General Economic and Financial Affairs, European Commission.

Eichengreen, B. and Jeffrey S., 1986, "Exchange Rates and Economic Recovery in the 1930s", National Bureau of Economic Research Working Paper.

Eichengreen, B., 2007. "The Breakup of the Euro Area" NBER Working Papers 13393, National Bureau of Economic Research, Inc.

Firoozye, N., and J. Nordvig. 2012. "Rethinking the European Monetary Union." Wolfson Economics Prize 2012 – Final Submission.

Fleming, J. M. 1962. "Domestic Financial Policies Under Fixed and Under Floating Exchange Rates.", *Staff Papers*, International Monetary Fund, Vol. 9 (November), pp. 369-79.

Galindo, A., U. Panizza and F. Schiantarelli. 2003a. "Currency Depreciations: Do They Boost or They Bust?" Inter-American Development Bank.

Galindo, A., U. Panizza and F. Schiantarelli. 2003b. "Debt Composition and Balance Sheet Effects of Currency Depreciation: a Summary of the Micro Evidence." *Emerging Markets Review*, 4, 330-339.

Goldstein, M., and P. Turner. 2004. "Controlling Currency Mismatches in Emerging Markets." Peterson Institute Press, number 373.

Gruic, B., and P. Wooldridge. 2012. "Enhancements to the BIS debt securities statistics." *BIS Quarterly Review*, December 2012.

Gutierrez, J. and Fernando M-N, 2004, "Argentina's Banking System: Restoring Financial Stability", World Bank Working Paper.

Hagelin, N., and B. Pramborg. 2004. "Hedging Foreign Exchange Exposure: Risk Reduction from Transaction and Translation Hedging." *Journal of International Financial Management & Accounting*, Volume 15, 1, 1-20.

Janot, M., G. P. Garcia and W. Novaes. 2008. "Balance Sheet Effects in Currency Crises: Evidence from Brazil." Working Paper Series 162. Banco Central do Brasil.

Jong, A. de, J. Ligterink and V. Macrae. 2002. "A Firm-Specific Analysis of the Exchange-Rate Exposure of Dutch Firms." ERIM Report Series Research in Management.

Krugman, P. 1999. "Balance Sheets, the Transfer Problem and Financial Crises." *International Tax and Public Finance*, 6, 459-472.

Mann, F. A., 1982, "The legal aspect of money : with special reference to comparative private and public international law", Oxford University Press, Oxford, 4th Ed.

Miller, M., Javier G. F. and Lei Zhang, 2004 "Default, Devaluation and Depression: Argentina after 2001", Working Paper.

Mundell, R. A. 1963. "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates.", *The Canadian Journal of Economics and Political Science*, Vol. 29, No. 4, Nov. 1963.

Nordvig, J., 2013. "The Fall of the Euro: Reinventing the Eurozone and the Future of Global Investing.", McGraw-Hill Professional.

O'Rourke, K. H. and Alan M. Taylor, 2013, "Cross of Euros", *Journal of Economic Perspectives*, Volume 27, Number 3.

Proctor, C., 2011, "The Euro – Fragmentation and the Financial Markets", *Capital Markets Law Journal*, 6 (1): 5-28.

Ritschl, A. and Samad S., 2010, "Crisis? What Crisis: Currency vs. Banking in the Financial Crisis of 1931", CEPR Discussion Paper 7610.

Schnabel, I., 2004. "The German Twin Crisis of 1931" *The Journal of Economic History*, Cambridge University Press, vol. 64(03), pages 822-871, September.

Schuker, S. A., 1988, "American "Reparations" to Germans, 1919-1933: Implications for the Third-World Debt Crisis", *Princeton University Studies in International Finance*, N°61.

Shin, H. S., and Y. Zhao. 2013. "Firms as Surrogate Intermediaries: Evidence from Emerging Economies.", Working Paper, Princeton University.

Smidkova, K., 1995, "Costs and Benefits of Monetary Disintegration: The Czech-Slovak Case", *Introduction of New Currencies and National Monetary Sovereignty, Development and International Cooperation* (Bratislava).

Tepper, J., 2012, "Primer on the Euro Breakup : Default, Exit and Devaluation as the Optimal Solution".

Tobal, M., 2013. "Currency Mismatch: New Database and Indicators for Latin America and the Caribbean." *Research Papers 12*, Center for Latin American Monetary Studies.

APPENDIX

Figure 1 – BIS data on private debt securities by nationality of the ultimate issuer

	Financial corporations	Non-financial corporations	Total private sector (amount out.)	Total private sector (% PIB 2013)
International debt securities	1052,7	374,6	1427,3	67,5%
Domestic debt securities	493,7	143,1	636,8	30,1%
Total debt securities	1546,4	517,7	2064,1	97,6%
<i>Source: BIS (all maturities, amounts outstanding as of March 2014 by nationality of issuer converted into €bn (official data in US\$bn) at the prevailing exchange rate US\$1=€0,75)</i>				
<i>Note: "nationality" means "country of operations of the issuer's owner"</i>				

	Total private sector (amount out.)	% of total
Debt securities under foreign law	1427,3	69%
Debt securities under French law	636,8	31%
<i>Source: BIS, own assumptions</i>		
<i>Note: private sector includes financial and non-financial corporations</i>		

Figure 2 – Private short-term marketable debt (Bloomberg database)

	Total private sector (amount outstanding in €bn)	% of total
ST debt payments under foreign law	116,2	44%
of which in EUR	71,3	27%
of which in foreign currencies	44,9	17%
ST debt payments under French law	68,7	26%
of which in EUR	60,7	23%
of which in foreign currencies	7,9	3%
ST debt payments under N/A law	79,2	30%
of which in EUR	52,8	20%
of which in foreign currencies	26,4	10%
ST debt payments to be redenominated	60,7	23%

Source: Bloomberg

Notes: N/A means "non available" (i.e. the information is not available on Bloomberg)

Debt securities to be redenominated are securities in EUR under French law (worst case scenario)

ST means "short term" (short term debt payments include principal and interest payments)

Figure 3 – BIS data on private debt securities by residence of the immediate issuer

	Financial corporations	Non-financial corporations	Total private sector (amount out.)	Total private sector (% PIB 2013)
International debt securities	934,7	346,1	1280,9	60,6%
Domestic debt securities	493,7	143,1	636,8	30,1%
Total debt securities	1428,5	489,2	1917,7	90,7%

Source: BIS (all maturities, amounts outstanding as of March 2014 by residence of issuer converted into €bn (official data in US\$bn) at the prevailing exchange rate US\$1=€0,75)

Note: "residence" means "country of operation of the issuer"

	Total private sector (amount out. €bn)	% of total
Debt securities under foreign law	1280,9	67%
Debt securities under French law	636,8	33%

Source: BIS, own assumptions

Note: private sector includes financial and non-financial corporations

Figure 4 – Balance sheet mismatch: ranking

Non-financial corporations (48)		
Strong mismatch	Low mismatch	No mismatch
SNCF	EDF	La Poste
Orange	PSA	Air-France KLM
Carrefour	TOTAL	GDF-Suez
Unibail-Rodamco	Renault	Schneider Electric
Numericable	Veolia	Sanofi
	Lafarge	Bouygues
	Airbus	Alstom
	Wendel	Air Liquide
	Thales	Vivendi
	Sodexo	LVMH
	Bolloré	Danone
	Saint-Gobain	Pernod-Ricard
	Arcelor-Mittal	Alcatel-Lucent
	Aéroports de Paris (ADP)	Vinci
		Casino
		Areva
		Valéo
		Lagardère
		Technicolor
		Auchan
		Vallourec
		Essilor-International
		Kering
		Safran
		Légrand
		Michelin
		Accor
		Publicis
		Unibel

Source: Bloomberg, Boursorama, annual reports, own computations

Financial corporations (14)		
Strong mismatch	Low mismatch	No mismatch
Société Générale	BNP Paribas	Groupama
BPCE	Crédit Agricole	
CIC-CM	Banque Postale	
HSBC France	AXA	
Exane	Scor	
Dexia Crédit Local	Caisse des dépôts et consignations	
Crédit Immobilier de France (CIF)		

Source: Bloomberg, Boursorama, annual reports, own computations

Figure 5 – Balance sheet mismatch (complete details and calculations)

Non-financial corporations:

	Sales	% sales in France	Marketable debt (amount out.)	% to be redenominated	Mismatch
La Poste	16 562 000 000€	77%	5 650 200 000 €	78%	0,9
Air France-KLM	25 520 000 000€	31%	3 561 199 987 €	95%	0,1
EDF	75 000 000 000€	53%	69 325 614 602 €	33%	1,4
SNCF	32 252 000 000€	100%	9 715 318 850 €	0%	∞
Orange	40 000 000 000€	50%	32 010 005 846 €	5%	1,9
GDF-Suez	89 300 000 000€	39%	26 934 440 247 €	71%	0,5
Carrefour	74 888 000 000€	47%	9 318 479 000 €	1%	1,9
TOTAL	189 542 000 000€	23%	31 489 367 800 €	0%	1,3
Renault	40 932 000 000€	24%	29 668 175 000 €	13%	1,2
Unibail-Rodamco	79 817 000 000€	53%	11 944 476 819 €	10%	1,9
Saint-Gobain	42 025 000 000€	28%	8 745 241 465 €	9%	1,3
Schneider Electric	23 551 000 000€	7%	5 299 623 000 €	44%	0,6
Arcelor-Mittal	57 000 000 000€	6%	14 091 005 000 €	0%	1,1
Sanofi	32 951 000 000€	8%	11 815 320 993 €	15%	0,9
Veolia	22 731 000 000€	50%	10 057 268 183 €	36%	1,3
Lafarge	15 200 000 000€	7%	9 777 684 400 €	0%	1,1
Bouygues	33 343 000 000€	66%	6 914 361 000 €	93%	0,2
Alstom	20 269 000 000€	11%	4 653 560 000 €	99%	0,0
Air Liquide	15 225 000 000€	19%	4 748 129 200 €	74%	0,3
Vivendi	22 165 000 000€	66%	6 648 827 882 €	83%	0,5
LVMH	29 149 000 000€	11%	4 432 390 000 €	68%	0,4
Danone	21 298 000 000€	10%	6 631 753 400 €	73%	0,3
Pernod-Ricard	8 575 000 000€	8%	7 578 500 000 €	51%	0,5
Alcatel-Lucent	14 449 000 000€	7%	4 834 018 363 €	37%	0,7
Vinci	40 300 000 000€	62%	12 072 650 000 €	71%	0,8
PSA	54 090 000 000€	47%	10 010 369 458 €	42%	1,1
Casino	48 645 000 000€	47%	8 795 500 000 €	100%	0
Areva	9 240 000 000€	41%	5 770 800 000 €	100%	0
Airbus	59 256 000 000€	8%	3 826 075 188 €	0%	1,1
Numericable	1 314 000 000€	100%	11 323 155 000 €	0%	∞
Valeo	12 100 000 000€	10%	1 119 100 000 €	100%	0
Lagardere	7 216 000 000€	37%	1 159 250 000 €	100%	0
Wendel	6 432 000 000€	28%	3 696 450 000 €	24%	1,1
Technicolor	3 450 000 000€	25%	507 457 000 €	99%	0,0
Thales	14 194 000 000€	29%	1 400 000 000 €	0%	1,4
Sodexo	18 397 000 000€	15%	1 980 000 000 €	0%	1,2
ADP	2 754 000 000€	100%	3 070 575 000 €	88%	∞
Auchan	47 885 000 000€	42%	5 601 757 500 €	86%	0,2
Bolloré	10 848 000 000€	44%	520 000 000 €	33%	1,2
Vallourec	5 578 000 000€	4%	1 050 000 000 €	100%	0
Essilor International	5 065 000 000€	17%	800 000 000 €	100%	0
Kering	9 748 000 000€	6%	2 900 000 000 €	100%	0
Safran	13 615 000 000€	24%	950 000 000 €	100%	0
Legrand	4 400 000 000€	21%	1 398 280 000 €	79%	0,3
Michelin	545 071 000€	10%	1 008 767 050 €	60%	0,4
Accor	5 536 000 000€	34%	3 323 525 000 €	96%	0,1
Publicis	18 751 000 000€	16%	682 071 116 €	100%	0
Unibel	2 700 000 000€	20%	160 000 000 €	100%	0
All non-financial corporations	1 423 783 071 000€	34,8%	418 970 743 348 €	35,5%	1,0

Source: Bloomberg, annual reports

Note: (1) Mismatch = (1-%marketable debt to be redenominated)/(1-%sales in France) ; (2) according to this definition, there is a mismatch related to the redenomination problem if "Mismatch>1"

Financial corporations:

	Revenues	% revenues in France	Marketable debt (amount out.)	% to be redenominated	Mismatch
BNP Paribas	38 822 000 000€	35%	156 112 294 374 €	17%	1,3
Société Générale	22 831 000 000€	46%	236 068 526 262 €	13%	1,6
Crédit Agricole	16 015 000 000€	51%	160 182 819 980 €	38%	1,3
BPCE	22 826 000 000€	84%	116 952 494 892 €	49%	3,2
CIC-CM	11 977 000 000€	82%	84 687 879 707 €	45%	3,1
HSBC France	2 125 000 000€	100%	12 126 886 611 €	39%	∞
Dexia (FR)	-220 000 000 €	85%	45 027 228 862 €	2%	6,6
Banque Postale	5 527 000 000€	100%	4 237 000 000 €	71%	∞
CIF	13 519 808€	100%	24 954 751 680 €	44%	∞
Exane	359 807 000€	100%	1 009 988 449 €	53%	∞
AXA	91 000 000 000€	16%	27 939 626 627 €	11%	1,1
Groupama	10 423 000 000€	72%	2 729 400 000 €	100%	0
Scor	10 300 000 000€	24%	1 366 225 603 €	19%	1,1
Caisse des dépôts (CDC)	3 649 000 000€	100%	6 262 300 000 €	66%	∞
All financial corporations	235 648 326 808€	41,1%	879 657 423 046 €	27,6%	1,2

Source: Bloomberg, annual reports

Note: (1) Mismatch = (1-%marketable debt to be redenominated)/(1-%revenues in France) ; (2) according to this definition, there is a mismatch related to the redenomination problem if "Mismatch>1"

Figure 6 – Debt Coverage ratios (complete details and calculations)

Non-financial corporations:

	EBITDA	% EBITDA France	Marketable debt (amount out.)	% to be redenominated	Debt coverage ratio (DCR)	20% devaluation DCR	35% devaluation DCR	50% devaluation DCR
La Poste	824 000 000€	77%	5 650 200 000 €	78%	14,6%	14,6%	14,6%	14,7%
Air France-KLM	1 855 000 000€	31%	3 561 199 987 €	95%	52,1%	60,3%	69,4%	83,6%
EDF	16 765 000 000€	64%	69 325 614 602 €	33%	24,2%	22,6%	21,2%	19,7%
SNCF	2 800 000 000€	100%	9 715 318 850 €	0%	28,8%	23,1%	18,7%	14,4%
Orange	12 646 000 000€	60%	32 010 005 846 €	5%	39,5%	35,1%	31,7%	28,3%
GDF-Suez	13 418 000 000€	36%	26 934 440 247 €	71%	49,8%	53,9%	58,0%	63,5%
Carrefour	3 670 000 000€	47%	9 318 479 000 €	1%	39,4%	35,7%	33,0%	30,3%
TOTAL	29 448 000 000€	23%	31 489 367 800 €	0%	93,5%	89,2%	86,0%	82,8%
Renault	3 783 000 000€	24%	29 668 175 000 €	13%	12,8%	12,5%	12,2%	12,0%
Unibail-Rodamco	1 349 000 000€	53%	11 944 476 819 €	10%	11,3%	10,3%	9,5%	8,8%
Saint-Gobain	4 189 000 000€	23%	8 745 241 465 €	9%	47,9%	46,6%	45,5%	44,5%
Schneider Electric	3 911 000 000€	7%	5 299 623 000 €	44%	73,8%	79,8%	85,2%	91,4%
Arcelor-Mittal	5 166 000 000€	6%	14 091 005 000 €	0%	36,7%	36,2%	35,9%	35,6%
Sanofi	10 612 000 000€	8%	11 815 320 993 €	15%	89,8%	91,1%	92,1%	93,1%
Veolia	1 796 000 000€	50%	10 057 268 183 €	36%	17,9%	17,3%	16,9%	16,3%
Lafarge	3 102 000 000€	7%	9 777 684 400 €	0%	31,7%	31,3%	30,9%	30,6%
Bouygues	2 835 000 000€	66%	6 914 361 000 €	93%	41,0%	43,7%	46,6%	51,1%
Alstom	1 647 000 000€	11%	4 653 560 000 €	99%	35,4%	43,2%	52,0%	66,1%
Air Liquide	3 817 000 000€	19%	4 748 129 200 €	74%	80,4%	90,8%	101,3%	115,6%
Vivendi	4 928 000 000€	66%	6 648 827 882 €	83%	74,1%	77,1%	80,2%	84,6%
LVMH	7 340 000 000€	11%	4 432 390 000 €	68%	165,6%	187,3%	208,7%	236,5%
Danone	3 519 000 000€	10%	6 631 753 400 €	73%	53,1%	60,9%	68,8%	79,5%
Pernod-Ricard	2 416 000 000€	8%	7 578 500 000 €	51%	31,9%	34,9%	37,7%	41,0%
Alcatel-Lucent	958 000 000€	7%	4 834 018 363 €	37%	19,8%	21,1%	22,2%	23,5%
Vinci	5 596 000 000€	62%	12 072 650 000 €	71%	46,4%	47,3%	48,3%	49,6%
PSA	2 230 000 000€	47%	10 010 369 458 €	42%	22,3%	22,0%	21,8%	21,6%
Casino	3 337 000 000€	47%	8 795 500 000 €	100%	37,9%	43,0%	48,8%	58,0%
Areva	1 043 000 000€	41%	5 770 800 000 €	100%	18,1%	20,8%	23,9%	28,8%
Airbus	4 575 000 000€	8%	3 826 075 188 €	0%	119,6%	117,7%	116,3%	114,9%
Numerical	603 000 000€	100%	11 323 155 000 €	0%	5,3%	4,3%	3,5%	2,7%
Valco	1 339 000 000€	10%	1 119 100 000 €	100%	119,6%	146,7%	177,9%	227,9%
Lagardere	2 626 000 000€	37%	1 159 250 000 €	100%	226,5%	262,3%	303,6%	369,6%
Wendel	1 114 000 000€	28%	3 696 450 000 €	24%	30,1%	29,9%	29,7%	29,5%
Technicolor	536 000 000€	25%	507 457 000 €	99%	105,6%	124,9%	146,9%	181,8%
Thales	1 415 000 000€	29%	1 400 000 000 €	0%	101,1%	95,2%	90,8%	86,3%
Sodexo	1 224 000 000€	15%	1 980 000 000 €	0%	61,8%	60,0%	58,6%	57,2%
ADP	1 075 000 000€	100%	3 070 575 000 €	88%	35,0%	34,0%	32,9%	31,2%
Auchan	2 636 000 000€	42%	5 601 757 500 €	86%	47,1%	52,0%	57,3%	65,0%
Bolloré	957 000 000€	44%	520 000 000 €	33%	184,0%	179,6%	175,8%	171,6%
Valloirec	920 000 000€	4%	1 050 000 000 €	100%	87,6%	108,8%	133,1%	172,2%
Essilor International	1 117 000 000€	17%	800 000 000 €	100%	139,6%	168,8%	202,4%	256,2%
Kering	2 046 000 000€	6%	2 900 000 000 €	100%	70,6%	87,1%	106,3%	136,9%
Safran	2 352 000 000€	24%	950 000 000 €	100%	247,6%	294,5%	348,7%	435,4%
Legrand	1 020 000 000€	21%	1 398 280 000 €	79%	72,9%	82,9%	93,2%	107,5%
Michelin	3 285 000 000€	10%	1 008 767 050 €	60%	325,6%	362,8%	398,2%	442,7%
Accor	865 000 000€	34%	3 323 525 000 €	96%	26,0%	30,0%	34,6%	41,7%
Publicis	1 265 000 000€	16%	682 071 116 €	100%	185,5%	224,6%	269,9%	342,2%
Unibel	317 300 000€	20%	160 000 000 €	100%	198,3%	238,0%	283,7%	357,0%

Sources: Bloomberg, Boursorama, annual reports
Note: DCR = EBE / Marketable debt

Financial corporations:

	EBITDA	% EBITDA France	Marketable debt (amount out.)	% to be redenominated	Debt coverage ratio (DCR)	20% devaluation DCR	35% devaluation DCR	50% devaluation DCR
BNP Paribas	12 684 000 000 €	35%	156 112 294 374 €	17%	8,1%	7,8%	7,6%	7,3%
Société Générale	6 432 000 000 €	46%	236 068 526 262 €	13%	2,7%	2,5%	2,4%	2,2%
Crédit Agricole	4 738 000 000 €	51%	160 182 819 980 €	38%	3,0%	2,9%	2,8%	2,7%
BPCE	6 944 000 000 €	84%	116 952 494 892 €	49%	5,9%	5,5%	5,1%	4,6%
CIC-CM	4 546 000 000 €	82%	84 687 879 707 €	45%	5,4%	4,9%	4,5%	4,1%
HSBC France	521 104 000 €	100%	12 126 886 611 €	39%	4,3%	3,7%	3,2%	2,7%
Dexia (FR)	-585 000 000 €	85%	45 027 228 862 €	2%	-1,3%	-1,1%	-0,9%	-0,8%
Banque Postale	854 000 000 €	100%	4 237 000 000 €	71%	20,2%	18,8%	17,4%	15,6%
CIF	10 012 223 €	100%	24 954 751 680 €	44%	0,0%	0,0%	0,0%	0,0%
Exane	63 289 000 €	100%	1 009 988 449 €	53%	6,3%	5,6%	5,0%	4,3%
AXA	33 958 000 000 €	16%	27 939 626 627 €	11%	121,5%	120,4%	119,5%	118,5%
Groupama	3 171 000 000 €	72%	2 729 400 000 €	100%	116,2%	124,3%	133,7%	148,7%
Scor	581 000 000 €	24%	1 366 225 603 €	19%	42,5%	42,1%	41,7%	41,3%
Caisse des dépôts (CDC)	3 649 000 000 €	100%	6 262 300 000 €	66%	58,3%	53,7%	49,2%	43,4%

Sources: Bloomberg, Boursorama, annual reports
Note: DCR = EBE / Marketable debt

Figure 7 – Variations (%) in the Debt Service Coverage ratios between baseline and distress situations

	20% deval. impact on DSCR	35% deval. impact on DSCR
SNCF	-20,0%	-35,0%
Numericable	-20,0%	-35,0%
ADP	-15,0%	-27,5%
Orange	-11,8%	-20,7%
Unibail-Rodamco	-10,5%	-18,4%
Carrefour	-9,2%	-16,1%
Veolia	-7,5%	-13,4%
EDF	-7,3%	-13,4%
Thales	-5,8%	-10,2%
PSA	-5,1%	-9,2%
Wendel	-4,7%	-8,3%
TOTAL	-4,6%	-8,0%
Saint-Gobain	-4,1%	-7,2%
Bolloré	-3,4%	-6,2%
Sodexo	-3,0%	-5,3%
Michelin	-2,0%	-3,6%
Airbus	-1,6%	-2,7%
Lafarge	-1,4%	-2,5%
Sanofi	-1,4%	-2,4%
Arcelor-Mittal	-1,2%	-2,1%
Renault	0,6%	1,0%
Alcatel-Lucent	1,1%	1,9%
La Poste	1,4%	3,0%
Vivendi	2,9%	6,0%
Vinci	5,3%	11,0%
GDF-Suez	7,7%	15,4%
Bouygues	8,1%	17,3%
Legrand	9,6%	18,9%
Auchan	10,0%	20,6%
Casino	13,3%	28,5%
Areva	14,9%	32,0%
Lagardere	15,8%	34,0%
Accor	15,9%	34,1%
LVMH	16,7%	34,3%
Air France-KLM	17,0%	36,4%
Pernod-Ricard	18,6%	38,4%
Technicolor	18,0%	38,4%
Air Liquide	18,8%	39,8%
Safran	19,0%	40,9%
Schneider Electric	19,8%	41,4%
Unibel	20,0%	43,1%
Danone	20,9%	44,4%
Alstom	21,0%	44,8%
Essilor International	20,9%	45,0%
Publicis	21,1%	45,5%
Valeo	22,6%	48,7%
Kering	23,5%	50,6%
Vallourec	24,1%	52,0%

Source: Bloomberg, annual reports
Note: NFCs are ranked from the most to the least affected by the Euro exit

	20% deval. impact on DSCR	35% deval. impact on DSCR
HSBC France	-11,6%	-22,1%
Banque Postale	-11,4%	-21,7%
CIC-CM	-11,3%	-20,8%
BPCE	-11,3%	-20,7%
CIF	-9,3%	-18,0%
Caisse des dépôts (CDC)	-8,5%	-16,6%
Crédit Agricole	-6,6%	-11,8%
Société Générale	-5,7%	-10,2%
BNP Paribas	-5,1%	-9,0%
Exane	-4,5%	-9,2%
AXA	-2,4%	-4,2%
Scor	-0,4%	-0,7%
Groupama	7,0%	15,1%

Source: Bloomberg, annual reports
Note: banks and other financial institutions are ranked from the most to the least affected by the Euro exit

Figure 8 - Debt Service Coverage ratios (complete details and calculations)

Non-financial corporations:

	Adjusted EBITDA	% EBITDA France	Short-term marketable debt	% to be redenominated	Debt service coverage ratio (DSCR)	20% devaluation DSCR	35% devaluation DSCR	50% devaluation DSCR
La Poste	1 153 600 000€	77%	244 323 750 €	83%	4,7	4,8	4,9	5,0
Air France-KLM	2 597 000 000€	31%	821 685 698 €	99%	3,2	3,7	4,3	5,3
EDF	23 471 000 000€	64%	7 320 012 098 €	30%	3,2	3,0	2,8	2,6
SNCF	3 920 000 000€	100%	1 087 293 247 €	0%	3,6	2,9	2,3	1,8
Orange	17 704 400 000€	60%	4 143 825 818 €	1%	4,3	3,8	3,4	3,0
GDF-Suez	18 785 200 000€	36%	3 405 986 787 €	69%	5,5	5,9	6,4	6,9
Carrefour	5 138 000 000€	47%	2 537 583 290 €	2%	2,0	1,8	1,7	1,6
TOTAL	41 227 200 000€	23%	5 543 354 008 €	0%	7,4	7,1	6,8	6,6
Renault	5 296 200 000€	24%	9 324 433 923 €	27%	0,6	0,6	0,6	0,6
Unibail-Rodamco	1 888 600 000€	53%	1 458 345 364 €	0%	1,3	1,2	1,1	1,0
Saint-Gobain	5 864 600 000€	23%	1 365 542 932 €	3%	4,3	4,1	4,0	3,8
Schneider Electric	5 475 400 000€	7%	942 854 316 €	89%	5,8	7,0	8,2	10,1
Arcelec-Mittal	7 232 400 000€	6%	2 944 786 413 €	0%	2,4	2,5	2,4	2,4
Sanofi	14 856 800 000€	8%	2 996 154 987 €	1%	5,0	4,9	4,8	4,8
Veolia	2 514 400 000€	50%	1 367 120 548 €	13%	1,8	1,7	1,6	1,5
Lafarge	4 342 800 000€	7%	2 068 879 488 €	0%	2,1	2,1	2,0	2,0
Bouygues	3 969 000 000€	66%	2 127 128 794 €	99%	1,9	2,0	2,2	2,5
Alstom	2 305 800 000€	11%	1 475 291 300 €	96%	1,6	1,9	2,3	2,8
Air Liquide	5 343 800 000€	19%	637 122 626 €	95%	8,4	10,0	11,7	14,4
Vivendi	6 899 200 000€	66%	270 414 726 €	79%	25,5	26,3	27,0	28,1
LVMH	10 276 000 000€	11%	1 016 460 463 €	81%	10,1	11,8	13,6	16,1
Danone	4 926 600 000€	10%	762 187 610 €	95%	6,5	7,8	9,3	11,7
Pernod-Ricard	3 382 400 000€	8%	1 153 066 928 €	85%	2,9	3,5	4,1	4,9
Alcatel-Lucent	1 341 200 000€	7%	231 348 570 €	12%	5,8	5,9	5,9	6,0
Vinci	7 834 400 000€	62%	979 203 863 €	84%	8,0	8,4	8,9	9,5
PSA	3 122 000 000€	47%	3 152 307 073 €	23%	1,0	0,9	0,9	0,9
Casino	4 671 800 000€	47%	1 089 405 423 €	100%	4,3	4,9	5,5	6,6
Areva	1 460 200 000€	41%	231 301 250 €	100%	6,3	7,3	8,3	10,1
Airbus	6 405 000 000€	8%	175 135 374 €	0%	36,6	36,0	35,6	35,1
Numericable	844 200 000€	100%	642 507 088 €	0%	1,3	1,1	0,9	0,7
Valco	1 874 600 000€	10%	44 455 125 €	100%	42,2	51,7	62,7	80,3
Lagardere	3 676 400 000€	37%	712 013 438 €	100%	5,2	6,0	6,9	8,4
Wendel	1 559 600 000€	28%	1 074 416 938 €	5%	1,5	1,4	1,3	1,3
Technicolor	750 400 000€	25%	29 447 230 €	98%	25,5	30,1	35,3	43,5
Thales	1 981 000 000€	29%	31 375 000 €	0%	63,1	59,5	56,7	53,9
Sodexo	1 713 600 000€	15%	958 000 000 €	0%	1,8	1,7	1,7	1,7
ADP	1 505 000 000€	100%	306 606 094 €	29%	4,9	4,2	3,6	2,9
Auchan	3 690 400 000€	42%	775 100 456 €	84%	4,8	5,2	5,7	6,5
Bullore	1 339 800 000€	44%	26 156 500 €	28%	51,2	49,5	48,1	46,5
Valloirec	1 288 000 000€	4%	40 625 000 €	100%	31,7	39,4	48,2	62,3
Essilor International	1 563 800 000€	17%	15 875 000 €	100%	98,5	119,1	142,8	180,8
Kering	2 864 400 000€	6%	846 625 000 €	100%	3,4	4,2	5,1	6,6
Safran	3 292 800 000€	24%	785 750 000 €	100%	4,2	5,0	5,9	7,4
Legrand	1 428 000 000€	21%	69 103 800 €	63%	20,7	22,7	24,6	27,0
Michelin	4 599 000 000€	10%	11 000 000 €	0%	418,1	409,6	403,2	396,9
Accor	1 211 000 000€	34%	109 196 688 €	98%	11,1	12,9	14,9	18,1
Publicis	1 771 000 000€	16%	278 132 989 €	100%	6,4	7,7	9,3	11,7
Unibel	444 220 000€	20%	4 750 000 €	100%	93,5	112,2	133,8	168,3

Source: Bloomberg, Boursorama, annual reports

Note: (1) "short-term marketable debt" is defined as the debt service (i.e. principal + interests) on marketable debt ; (2) DSCR = EBE / Debt service on marketable debt (end 2015)

Financial corporations:

	Adjusted EBITDA	% EBITDA France	Short-term marketable debt	% to be redenominated	Debt service coverage ratio (DSCR)	20% devaluation DSCR	35% devaluation DSCR	50% devaluation DSCR
BNP Paribas	17 757 600 000 €	35%	47 825 633 393 €	10%	0,37	0,35	0,34	0,32
Société Générale	9 004 800 000 €	46%	34 855 076 236 €	18%	0,26	0,24	0,23	0,22
Crédit Agricole	6 633 200 000 €	51%	34 038 463 270 €	19%	0,19	0,18	0,17	0,16
BPCE	9 721 600 000 €	84%	26 100 959 953 €	31%	0,37	0,33	0,29	0,26
CIC-CM	6 364 400 000 €	82%	17 318 513 591 €	29%	0,37	0,33	0,29	0,25
HSBC France	729 545 600 €	100%	2 027 262 004 €	47%	0,36	0,32	0,28	0,24
Dexia (FR)	-819 000 000 €	85%	19 969 402 740 €	1%	-0,04	-0,03	-0,03	-0,02
Banque Postale	1 195 600 000 €	100%	527 390 390 €	49%	2,27	2,01	1,77	1,50
CIF	14 017 112 €	100%	10 192 913 855 €	59%	0,00	0,00	0,00	0,00
Exane	88 604 600 €	100%	279 148 099 €	81%	0,32	0,30	0,29	0,27
AXA	47 541 200 000 €	16%	2 767 025 624 €	4%	17,18	16,78	16,47	16,16
Groupama	4 439 400 000 €	72%	159 704 462 €	100%	27,80	29,74	31,99	35,58
Scor	813 400 000 €	24%	71 009 394 €	22%	11,45	11,41	11,38	11,34
Caisse des dépôts (CDC)	5 108 600 000 €	100%	298 316 488 €	63%	17,12	15,68	14,28	12,50

Source: Bloomberg, Boursorama, annual reports

Note: (1) "short-term marketable debt" is defined as the debt service (i.e. principal + interests) on marketable debt ; (2) DSCR = EBE / Debt service on marketable debt (end 2015)

Figure 9 – Implicit State's guarantees on non-financial corporations (exit cost)

States's shares/holdings	
SNCF	100%
EDF	84%
ADP	51%
Thales	26%
PSA	14%
Orange	13%
Airbus	11%
Numericable	0%
Unibail-Rodamco	0%
Carrefour	0%
Veolia	0%
Wendel	0%
TOTAL	0%
Saint-Gobain	0%
Bolloré	0%
Sodexo	0%
Michelin	0%
Lafarge	0%
Sanofi	0%
Arcelor-Mittal	0%
Cost of exit for NFCs with implicit state guarantee	6 327 916 504€
% of total cost of exit for French NFCs	57%
<i>Source: APE (Agence des Participations de l'Etat)</i>	
Note: cost of exit in the 20% devaluation case (see table below)	

Figure 10 – Total financial debt vs. total marketable debt

	Marketable debt (amount out.)	Financial debt (amount out.)	Ratio
La Poste	5 650 200 000 €	7 103 000 000€	79,5%
Air France-KLM	3 561 199 987 €	10 899 000 000€	32,7%
EDF	69 325 614 602 €	82 660 000 000€	83,9%
SNCF	9 715 318 850 €	13 327 000 000€	72,9%
Orange	32 010 005 846 €	37 395 000 000€	85,6%
GDF-Suez	26 934 440 247 €	38 160 000 000€	70,6%
Carrefour	9 318 479 000 €	12 538 000 000€	74,3%
TOTAL	31 489 367 800 €	52 958 000 000€	59,5%
Renault	29 668 175 000 €	32 810 000 000€	90,4%
Unibail-Rodamco	11 944 476 819 €	12 354 000 000€	96,7%
Saint-Gobain	8 745 241 465 €	11 912 000 000€	73,4%
Schneider Electric	5 299 623 000 €	8 859 000 000€	59,8%
Arcelor-Mittal	14 091 005 000 €	16 733 250 000€	84,2%
Sanofi	11 815 320 993 €	14 300 000 000€	82,6%
Veolia	10 057 268 183 €	14 195 000 000€	70,9%
Lafarge	9 777 684 400 €	13 662 000 000€	71,6%
Bouygues	6 914 361 000 €	7 994 000 000€	86,5%
Alstom	4 653 560 000 €	5 721 000 000€	81,3%
Air Liquide	4 748 129 200 €	7 006 000 000€	67,8%
Vivendi	6 648 827 882 €	12 266 000 000€	54,2%
LVMH	4 432 390 000 €	8 847 000 000€	50,1%
Danone	6 631 753 400 €	11 927 000 000€	55,6%
Pernod-Ricard	7 578 500 000 €	9 280 000 000€	81,7%
Alcatel-Lucent	4 834 018 363 €	6 162 000 000€	78,4%
Vinci	12 072 650 000 €	20 789 000 000€	58,1%
PSA	10 010 369 458 €	22 022 000 000€	45,5%
Casino	8 795 500 000 €	11 139 000 000€	79,0%
Areva	5 770 800 000 €	6 176 000 000€	93,4%
Airbus	3 826 075 188 €	5 601 000 000€	68,3%
Numericable	11 323 155 000 €	11 915 300 000€	95,0%
Valeo	1 119 100 000 €	1 876 000 000€	59,7%
Lagardere	1 159 250 000 €	1 423 000 000€	81,5%
Wendel	3 696 450 000 €	3 786 000 000€	97,6%
Technicolor	507 457 000 €	1 022 000 000€	49,7%
Thales	1 400 000 000 €	1 996 000 000€	70,1%
Sodexo	1 980 000 000 €	2 607 000 000€	75,9%
ADP	3 070 575 000 €	4 154 000 000€	73,9%
Auchan	5 601 757 500 €	7 462 000 000€	75,1%
Bollre	520 000 000 €	3 374 000 000€	15,4%
Vallourec	1 050 000 000 €	1 379 091 000€	76,1%
Essilor International	800 000 000 €	1 174 000 000€	68,1%
Kering	2 900 000 000 €	4 869 000 000€	59,6%
Safran	950 000 000 €	2 814 000 000€	33,8%
Legrand	1 398 280 000 €	1 573 500 000€	88,9%
Michelin	1 008 767 050 €	2 303 000 000€	43,8%
Accor	3 323 525 000 €	4 295 000 000€	77,4%
Publicis	682 071 116 €	860 000 000€	79,3%
Unibel	160 000 000 €	391 147 000€	40,9%
All	418 970 743 348 €	574 069 288 000€	73,0%

Source: Bloomberg, annual reports

Note: marketable debt is obtained via Bloomberg (as of August 2014), and financial debt (as of June 2014) is available in updated 2013 annual reports

	Marketable debt (amount out.)	Financial debt (amount out.)	Ratio
BNP Paribas	156 112 294 374 €	276 084 000 000€	56,5%
Société Générale	236 068 526 262 €	325 568 526 262€	72,5%
Crédit Agricole	160 182 819 980 €	291 309 000 000€	55,0%
BPCE	116 952 494 892 €	332 000 000 000€	35,2%
CIC-CM	84 687 879 707 €	130 482 000 000€	64,9%
HSBC France	12 126 886 611 €	13 259 000 000€	91,5%
Dexia (FR)	45 027 228 862 €	128 337 000 000€	35,1%
Banque Postale	4 237 000 000 €	24 595 640 000€	17,2%
CIF	24 954 751 680 €	25 297 000 000€	98,6%
Exane	1 009 988 449 €	1 762 000 000€	57,3%
AXA	27 939 626 627 €	32 384 000 000€	86,3%
Groupama	2 729 400 000 €	3 711 984 000 €	73,5%
Scor	1 366 225 603 €	1 415 000 000€	96,6%
Caisse des dépôts (CD)	6 262 300 000 €	48 132 000 000€	13,0%
All	879 657 423 046 €	1 634 337 150 262€	53,8%

Source: Bloomberg, annual reports (updated at 30 June 2014)

Note: for a banking group, we define "financial debt" as the sum of "debt securities" and "liabilities due to credit institutions"

Figure 11 – “Velvet Divorce”, Czechoslovakia: financial transfer

The clearing system was divided in two blocks. The old block, aimed at settling claims and obligations that had been contracted before the separation, converted payments in national currencies at the fixed exchange rate of CZK 1 = SKK 1. The new block, aimed at settling claims and obligations that had been contracted after the separation, converted payments on the basis of the exchange rates of both currencies *vis-à-vis* the European Currency Unit. An accounting unit, called “XCU”, was thus established. But a sophisticated point is that, as Dedek et al. (1996) put it, “countries could independently adjust the clearing rate of their clearing XCU within the band of 5 percent in both directions from central parity”.

Hence, there were three elements of financial support to Slovakia. First, the clearing system did not require an immediate settlement of aggregate claims and obligations within the system, thereby allowing for a mechanism of automatic lending from the surplus country to the deficit country. Second, the new block was settled at an exchange rate that could be more favorable than the “market rate” that would have prevailed absent the clearing system, which can be proxied by the crossed exchange rates *vis-à-vis* the XCU. Indeed, the Czech Republic devalued its currency by 3% *vis-à-vis* the XCU and the Slovak Republic revalued their currency by 5% *vis-à-vis* the XCU in 1993, thereby subtracting 8.2% of the sums that would have been due under prevailing market rates. Third, the old block was settled at an even more accommodating exchange rate, since it did not take into account the 10% devaluation of the Slovak Crown *vis-à-vis* the Czech crown.

The extent of the support provided by the Czech *via* the clearing system can thus be very simply written (with the sign expected to be negative):

Payments from Slovak to Czech - Payments from Czech to Slovak

+8.2% (Payments from Slovak to Czech in the new block)

+18.2% (Payments from Slovak to Czech in the old block)

However, we lack disaggregated data on these payments. Therefore, we write a proxy equation, which provide us for a minimum amount of the support enjoyed by Slovakia:

Total net claims on the clearing system + 18.2% (net claims within the old block)

CZK5 billion were provided on the whole at the end of 1993. The net obligations within the old block amounted to CZK11 billion and the net obligations within the new block amounted to minus CZK6 billion (Czechoslovakia was a net debtor within the new payments). We thus disregard the second since including “net claims within the new block” would provide us a meaningless figure. Hence, at least, the Czech provided CZK7.05 billion to Slovakia. This is equivalent to 0.64% of Czech GDP in 1993 and 2.56% of Slovak GDP.