Dispersion of company markups internationally

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The
strong globalization of economies has increased interest in
the importance of markups
for companies with an international orientation. A markup is
defined as the
difference between the marginal cost of production and the
selling price.
Empirical evidence is accumulating to show that these markups
have increased
significantly in recent years (Autor, Dorn, Katz, Patterson,
and Reenen, 2017;
Loecker, Eeckhout, and Unger, 2020) and that large
corporations account for a
growing share of the aggregate fluctuations (Gabaix, 2011).
Moreover, the
dispersion of markups is considered in the literature as a
potential source of a
misallocation of resources – capital and labour – in both
economies considered to
be closed to international trade (see Restuccia and Rogerson,
2008, or Baqaee
and Farhi, 2020) and economies considered to be open to trade
(Holmes, Hsu and
Lee, 2014, or Edmond, Midrigan and Xu, 2015). Finally, it has
recently been
shown by Gaubert and Itskhoki (2020) that these markups are a
key determinant
of the granular origin – i.e. linked to the activity of big
exporters – of
comparative advantages, or in other words, they may be a

determinant of trade competitiveness.

In
a recent paper (Auray and Eyquem, 2021), we introduce a dispersion of profit
margins by assuming strategic pricing viaBertrand-type competition in a
two-country model with endogenous variety effects and international trade along
the lines of Ghironi and Melitz (2005). Our aim is to understand the
interaction between these margins, firm productivity and entry-and-exit
phenomena in domestic and foreign markets. If there are distortions in the
allocation of resources, as is usually the case in these models, our corollary
objective is to study the implementation of optimal fiscal policy.

In
models with heterogeneous firms such as Ghironi and Melitz (2005), firms are
assumed to be heterogeneous in terms of individual productivity. The most
productive firms are more likely to enter markets, because they are better able
to pay fixed entry costs, whether in local or export markets. Moreover, because
these firms are more efficient, their production costs are lower, which allows
them to capture larger market shares. These effects, which seem relatively
intuitive, have already been widely validated empirically.

In
general, the introduction of strategic pricing behaviour allows firms with
larger market shares to benefit from greater price-setting power, which leads
them to charge higher markups – it being understood that the resulting selling
prices may be lower than those of their competitors. A growing literature on
international trade emphasises the importance of this kind of strategic
behaviour and the resulting dispersion of markups for determining patterns of
trade openness and their sectoral composition (see, for example, Bernard,
Eaton, Jensen and Kortum, 2003; Melitz and Ottaviano, 2008; Atkeson and
Burstein, 2008) but also for the magnitude of the welfare gains associated with
trade (Edmond, Midrigan and Xu, 2015). Indeed, in addition to the usual impact
of openness to trade, it could also reduce the adverse effects of the dispersion
of markups through the resulting increase in competition, thereby boosting its
positive effects.

First,
as expected, when fiscal policy is passive, Bertrand competition generates a
distribution of markups such that firms that are larger – hence the more
productive firms – offer lower prices, attract larger market shares and obtain
higher profit margins. Moreover, the mechanism for the selection of exporting
firms described by Melitz (2003) implies that these firms are

more productive
and therefore charge higher markups. These results are intuitive and consistent
with the observed distribution of markups (see Holmes, Hsu, and Lee, 2014).

Second,
we characterize the optimal allocation of resources and show how it can be
implemented. The best possible equilibrium fully corrects for price distortions
and implies a zero dispersion of markups and a near zero level of markups. It
is implemented, as is often the case in this literature, by generous subsidies
that cancel out markups while preserving the incentive for firms to enter
domestic and export markets, i.e. by allowing them to cover the fixed costs of
entry. This first-order equilibrium can be achieved using a combination of subsidies
for a firm's specific sales, a tax scheme on profits that differentiates between
non-exporting and exporting firms, and a specific labour tax.

In
a similar model where markups are assumed to be the same for all firms, the
best equilibrium is the same but, in contrast, much easier to implement through
a single policy instrument: a uniform and time-varying subsidy for all firms.

In
both cases, the gains associated with such policies are very large compared to the
laissez-faire case, representing a potential increase in household consumption

of around 15%. However, given the complexity of implementing a scheme with
heterogeneous markups and a cost to the public purse of over 20% of GDP —
implementation requires large amounts of subsidies, whether the markups are
heterogeneous or homogeneous — we consider second-order alternative policies,
where the number of policy instruments is limited and the government budget must
be balanced. We find that these restrictions significantly reduce the ability
of policy makers to cut the welfare losses associated with the laissez-faire
equilibrium, and that only one-third of the potential welfare gains can be
implemented in this case.

Third,
while the first-order allocations are independent of the degree of pricing
behaviour, we find that the welfare losses observed in the laissez-faire
equilibrium are lower when markups are heterogeneous and higher on average than
the markups observed in the absence of strategic pricing. While this may seem
surprising, the result can be rationalized by considering the effects of markup
dispersion on both the intensive markup — the
quantity produced per firm — and the extensive markup — the number of firms in
the markets. Indeed, Bertrand competition implies that the dispersion and the
average level of markups are positively related. Markup dispersion thus
increases the level of markups with two effects. On the one

hand, all other
things being equal, higher markups reduce the quantity produced by each firm — the
intensive markup — and induce a misallocation of resources that generates
welfare losses. On the other hand, higher markups imply higher expected profits
for potential entrants, which stimulates entry and thus increases the number of
existing firms — the extensive markup. According to our model, the welfare
gains associated with the second effect dominate the welfare losses associated
with the first effect. The result therefore implies that the dispersion of markups
can generate welfare gains, at least when no other tax or industrial policy is
pursued.

Fourth,
while the previous results mainly focus on the implications of our model and
the associated optimal policies on average over time, we also study their
dynamic properties. Within the framework of passive (laissez-faire) fiscal
policies, when the economy experiences aggregate productivity shocks — technological,
for instance — the model behaves broadly like the Ghironi and Melitz (2005)
model. An original prediction of our model is that markups are globally
countercyclical while export markups are procyclical. The optimal policy
involves adjustments in tax rates in order to reverse this trend, to align all markups
over the business cycle and to make all markups procyclical.

These results are
consistent with the findings of studies that focus on the optimal cyclical
behaviour of markups with heterogeneous firms in closed (Bilbiie, Ghironi and
Melitz, 2019) and open (Cacciatore and Ghironi, 2020) economy models. However, conditionally
on aggregate productivity shocks, the dispersion of markups has little effect
quantitatively compared to a similar model with homogeneous markups.

Finally,
in the spirit of Edmond, Midrigan and Xu (2015), we conducted a trade
liberalization experiment whereby the costs of trade gradually and permanently
decline to almost zero. We find that the long-run welfare gains are much larger
when the policy implemented is optimal. On the other hand, the laissez-faire
equilibrium indicates that short-run welfare gains are affected by markup
dispersion. Indeed, markup dispersion affects the dynamics of business creation
resulting from trade liberalization in a critical way. As in Edmond, Midrigan
and Xu (2015), markup dispersion reduces the long-run welfare gains from trade,
but for a different reason: it affects the dynamism of business creation and
reduces the number of firms in the long run. However, since in this case fewer
resources are invested in the short run to create new companies, consumption
increases more at the intensive markup in the short and medium run – less than

10 years. While the long-run welfare gains from trade integration vary from 12%
to 14.5%, depending on the calibration, the short-run welfare gains with
heterogeneous markups can be up to 3% larger than with homogeneous markups.

The
conclusions of this study lead to an approach to corporate profit margins that
is more nuanced than that usually found in the literature. Indeed, while the markups
and their dispersion do have negative effects on the economy, they also have an
important role to play in the phenomena of business entry and participation in
international markets. Our work is a complement to a strictly microeconomic
approach to industrial policy issues, which would conclude unequivocally that
the market power at the origin of these markups is harmful. As such, in the
manner of Schumpeter, this calls for a more balanced view of the role of company
markups in modern economies, which would show a tension between distortions of
competition and incentives to business creation.

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No love lost for Chinese investors!

By [Sarah Guillou](#)

In his [speech of 15 January 2017](#), France's Minister of Economy and Finance, Bruno Le Maire, speaks of "plundering investments", suspecting Chinese investors of wanting to "loot" French technology.These statements inscribe the Minister of the French Economy in line with economic patriotism from Colbert to Montebourg, but this time, they are part of a broader movement of distrust and resistance to investment from China that is hitting all the Western countries. And while the French government is planning to expand the scope of decrees controlling foreign investment, many other countries are doing the same.

France is not the only country to want to modify its legislation to reinforce the grounds for controlling foreign investors. The inflow of foreign capital was primarily viewed as a contribution of financial resources and a sign of a territory's attractiveness. France has always been well placed in international rankings in these terms. In 2015, France ranked eleventh in the world in terms of foreign direct investment inflows, with USD 43 billion, mainly from developed countries (compared with USD 31 billion for Germany and 20 billion for Italy). And since French resident investors have invested USD 38 billion abroad (Germany and Italy, USD 14 and 25 billion respectively), the balance is in favor of productive capital inflows, which exceed capital outflows.

However, France has always distinguished itself by its greater political mistrust of foreign equity, especially when it comes to its "flagship" industries. But now this mistrust is being echoed in Western countries with regard to Chinese investors, and not only across the Atlantic where all the political actors have had to sing in tune with the economic patriotism of the Trump administration. Chinese investors are also perceived as predators by the Germans, the British, the Australians, and the Italians, to name just a few.

It must be said that China's industrial strategy is very proactive, and the external growth strategies of Chinese business is being supported by a policy aimed at moving upmarket and acquiring technology by any means. Moreover, the presence of the State behind the investors — it is characteristic of China to have private and public interests tightly interwoven as well as a strong State presence in the economy because of its communist past — creates potential conflicts of sovereignty. Finally, China is threatening more and more sectors in which Western countries believed they had technological advantages, which is worrying governments (see the *Policy Brief de l'OFCE* by S. Guillou (no. 31, 2018), "Faut-il s'inquiéter de la stratégie industrielle de la Chine?" [Should we worry about China's industrial strategy]). Finally, China is not exactly exemplary in terms of taking in foreign investment, as it erects barriers and constraints often associated with technology transfer.

Western countries are reacting by increasing the scale of their controls: issues touching on national security and public order are being supplemented by strategic technologies and the ownership of databases on citizens. In France, the Minister of the Economy, Bruno Le Maire, announced that he wanted to extend this to the storage of digital data and to artificial intelligence. In Germany, the acquisition of Kuka, the manufacturer of industrial robots by the Chinese firm Midea, has led to strengthening German controls, and in

particular the refusal of the purchase of the Aixtron semiconductor maker.

In the United States, it is on the grounds of the acquisition of banking data that the acquisition of MoneyGram by Ant Financial — an offshoot of Alibaba — led the Committee on Foreign Investment of the United States (CFIUS) to issue a negative opinion very recently. The European project to create a committee identical to the CFIUS has not yet been concluded, and it has not attracted the support of all EU members as some look kindly on Chinese investors.

This policy, while not coordinated, is at least common among the main recipients of Chinese investment. France is not the only one to hold this position. This kind of unanimity among the Western clan is rare, but it also involves risks.

The first is isolationism: too many barriers lead to giving up partnership opportunities, which in some areas are increasingly unavoidable, as well as opportunities for strengthening Western companies. The second is the risk that equity bans will be circumvented by Chinese investors. Acquisitions are not always hostile, and companies that are being acquired are often ready for partnerships that can take other forms. Thus the failure of the merger of Alibaba with the American MoneyGram was offset by numerous agreements that the company sealed with European and American partners to facilitate the payments of Chinese tourists, in particular to allow the use of the Alipay payment platform. It will certainly seal a partnership of this type with MoneyGram. These partnerships lead to technology transfers and to sharing skills, or even data, without the counterpart of capital inflows. The third risk concerns the flow of Chinese capital into Asia and/or Africa, for example, allowing the capture of markets and resources that will handicap Western firms. Any Chinese capital available will have to be invested. The absence of Western partners will imply a loss of control and isolation that could be detrimental.

It is thus necessary to come back to the use of well-chosen but demanding controls, which are absent from the dichotomous reasoning that prevailed in the Minister's statements, if not his intentions. As long as French technology is attractive, this should be celebrated and the pluses and minuses of alliances need to be assessed. It will only be a matter of years before China's technology becomes as attractive as France's. And the Chinese will not fail to come and remind Mr. Le Maire of his position.

Leave the euro?

By [Christophe Blot](#), [Jérôme Creel](#), [Bruno Ducoudré](#), [Paul Hubert](#), [Xavier Ragot](#), [Raul Sampognaro](#), [Francesco Saraceno](#), and [Xavier Timbeau](#)

Evaluating the impact of France leaving the euro zone ("Frexit") is tricky, as many channels for doing this exist and the effects are uncertain. However, given that this proposal is being advanced in the more general debate over the costs and benefits of membership in the European Union and the euro, it is useful to discuss and estimate what is involved.

There is little consensus about the many points involved in an analysis of the issue of membership in the euro. On the one hand, the benefits linked to the single currency 18 years after its creation are not viewed as completely obvious; on the other, it is not evident that the monetary zone has become less heterogeneous, and, possibly linked to that, the current account imbalances built up in the first decade of the euro zone's existence, which have grown since then due to the consequences of the 2008 global financial crisis, are putting

constraints on economic policy.

The dissolution of Europe's monetary union would be an unprecedented event, not only for the member states but also from the point of view of the history of monetary unions. Not that there have been no experiences of dissolution – [Rose](2007) counted 69 cases of withdrawal from a monetary union since the end of the Second World War – but in many respects these experiences offer little if any basis for comparison ([Blot & Saraceno, 2014](#)). Nor do they reveal any empirical patterns that could inform us about the possible misfortunes or chances of success that a break-up of the euro zone might have.

However, the reference to past episodes is not the only tool with which the economist can carry out an analysis of a break-up of the euro zone. It is indeed possible to highlight the mechanisms that would be at work if the monetary union project in Europe were to be wound up. There are numerous possible pathways to a break-up of the euro zone, and any analysis of the costs and benefits must be interpreted with the utmost caution, since in addition to uncertainty about any quantitative assessment of what is involved, there is also the issue of what scenario an exit would create. In these circumstances, a departure from the euro zone cannot necessarily be understood solely from the point of view of its impact on exchange rates or its financial effects. It is very likely that an exit would be accompanied by the implementation of alternative economic policies. The analysis carried out here does not enter this territory, but merely explains the macroeconomic mechanisms at work in the event of a break-up of the euro zone, without detailing the reaction of economic policy or second-round effects.

The central hypothesis adopted here is that involving a complete break-up of the monetary union, and not the simple departure of France alone. Indeed, if France, the second-largest euro zone economy, were to exit, the very existence of

the monetary zone would be called into question. The devaluation of the French franc against the southern Europe countries remaining in the euro zone would destabilize their economies and push them out of the scaled-down euro zone. We do not deal here with all the technical elements related to how a break-up would be organized [1] – launching the circulation of new currencies, liquidation of the ECB and termination of the TARGET system, etc. – but rather on an analysis of the macroeconomic effects [2]. Two types of effects would then be at work. First, the dissolution of the European monetary union would de facto lead to a return to national currencies, and therefore to a devaluation or revaluation of the currencies of the euro zone countries vis-à-vis not only their euro zone partners but also non-euro zone countries. Second, the redenomination of assets and liabilities now denominated in euros and the prospect of exchange movements would have financial effects that we analyze in the light of past financial crises. Our scenario is therefore for a contained crisis.

A unilateral exit from the euro zone by France and the ensuing break-up of the euro zone exclude a scenario for a common currency where strong cooperation between the old member states would help to maintain a high level of exchange stability and effectively continue the economic status quo. There is little likelihood of a scenario like this, since it would lead to not using the margins of maneuver opened up by the exit and to maintaining the much-denounced and presumed straitjacket. The crisis would be contained in that the most violent effects would be reduced by coordinated policies. This would mean exchange movements that are rapid and substantial, but which stabilize over a time horizon of a few quarters [3]. We assume, furthermore, that each country pursues its own interest without special co-operation.

I – A summary of the economic mechanisms at work

The gains expected from leaving the euro zone

In the first place, leaving the euro zone would mean that the exchange rates between the currencies of the countries that compose it could once again vary against each other. Given this, the question arises of the value at which the exchange rates of these currencies will tend to converge. The expected gains would be, on the one hand, an improvement in competitiveness due to the devaluation of the franc. A devaluation would lead to imported inflation in the short term, before increasing purchasing power and spurring growth. The second gain involves the possibility of defining a monetary and fiscal policy that is differentiated by country, and therefore more appropriate to France's situation.

An exit from the euro zone would also make it possible to set tariffs less favorable to imports from other countries, and thus more favorable to producers on the national territory, but which would also affect consumer prices and thus consumer purchasing power[4].

The costs of leaving the euro zone

France's exit from the euro zone would lead to the departure of other countries, which would see their currencies depreciate against the franc, especially the southern European countries. The net effect on competitiveness may prove ambiguous.

A Frexit would lead to currency movements, which would translate into a return of transaction costs on currency exchanges between euro zone countries. Moreover, the break-up of the euro zone would also lead to a redenomination of assets and debts in the national currency. Beyond the legal aspects, these balance sheet effects would impoverish agents who hold assets denominated in a depreciating currency or debts re-denominated in an appreciating currency (and enrich those in the reverse situation). Uncertainties about balance sheet effects, particularly for financial intermediaries and banks, could be expected to lead to a period experiencing a sharp

downturn in lending.

How much additional autonomy would be acquired for monetary policy is uncertain at present. Indeed, it is difficult to conceive of a monetary policy that is much more expansionary than the ECB's policy of negative rates and security redemptions [5]. The Banque de France could, of course, buy back the national public debt by creating money, but, in light of the low current interest rates on French sovereign debt, it is not clear that this would lead to significant gains [6]. It should be noted that a persistent current account deficit would need to be financed by external savings and that this external constraint could affect monetary policy, for example by requiring an increase in short-term and long-term interest rates that could impose capital controls by the government.

Finally, the introduction of trade protectionism would obviously lead to retaliation by the aggrieved partners, which would hurt French exports. The overall net effect on world trade would be negative, with no gain at the national level.

II – The impact on exchange rates and competitiveness

A Frexit would not lead to strong gains in competitiveness. We simulated the effect of a Frexit in the following way:

1. We assume that a Frexit would lead to a rapid disintegration of the euro zone;

1. We then use our estimates of long-run equilibrium exchange rates presented in Chapter 4 of the *2017 iAGS Report*. It appears that the equilibrium parity for the new franc would correspond to an actual effective devaluation of 3.6% compared to the current level of the euro. This is a real change, once it has been corrected for the effects of inflation and is effective, that is, taking into account exchange rate fluctuations in relation to different trading partners, possibly in the opposite direction. The new franc would be devalued

relative to the German currency, but would appreciate relative to the Spanish currency;

2. Using the empirical estimates of exchange rate adjustments (Cavallo et al., 2005), we determine a short-term exchange rate trajectory. Our estimate is for a 13.7% depreciation of France's effective exchange rate with respect to the other euro zone countries, and an appreciation of 8.6% with respect to the countries that do not belong to the euro zone.

Using simulations with the emod.fr model, we estimate a modest increase in competitiveness. The effect on GDP would be close to 0 in the first year and 0.4% after three years. These figures are low and refer to a scenario without any readjustment within the euro zone. If we consider the possibility of a gradual adjustment within the euro zone (based on the mechanisms, for example, referred to in *iAGS 2016*), the potential gain would be even lower. Once again it is possible to envisage that the monetary policy conducted by the Banque de France would seek to devalue the French currency more strongly than that of its competitors. But in such a scheme, it is very likely that the latter will in turn wish to preserve their competitiveness and engage in a policy of competitive devaluations.

III — The financial impact: The effects of the banking crises

The dissolution of the euro zone and the return to national currencies would have significant repercussions for the national banking and financial systems through their international business, and it would bring about a return of exchange rate risk within the euro zone. We first assess the risks that the collapse of the euro zone would have for the banking system. The mechanisms at work are likely to provoke a banking crisis, which could have a high cost for economic activity.

The return to national currencies in a financially integrated

space would necessarily entail a major upheaval for the financial system. These effects would not be comparable to those observed at the time the euro was adopted. Indeed, as [Villemot et Durand (2017)](#) have shown, potentially the balance sheet effects would be significant for a low coordination scenario.

The balance sheet effects could be reduced if there were international coordination when leaving the euro. Such co-ordination would make it possible to distribute the ECB's assets and liabilities in a coherent way, notably within the framework of TARGET 2. However, it's difficult to assume a significant level of coordination when leaving the eurozone, and it is illusory to believe that the difficulties in achieving coordination will lessen. On the contrary, they are likely to increase in a climate of instability instead of one with a shared destiny. As a result, the scenario we use for leaving the euro zone excludes the establishment of a new financial or monetary architecture.

The risk of a banking or financial crisis is central to understanding the impact of the break-up of the euro zone. The impacts would pass through three main channels. The first involves a flight of deposits and savings and the distress liquidation of financial assets. The second is related to the effects of currency misalignments on banks' balance sheets and insurers. The third concerns the sovereign risk that would affect either the public debt and its financing, or if this debt were subject to uncontrolled monetization, the return of intense external pressure. The economic literature includes recent efforts (notably Rogoff and Reinhart, Borio, Schularik, the IMF) to try to evaluate banking or financial crises. It should be clarified at the outset that this literature does not deal with the dissolutions of monetary unions. In the various banking crises recorded since the 1970s by Laeven and Valencia (2010 and 2012), there is no mention of a crisis linked to the dissolution of a monetary union. Nevertheless,

the financial dynamics in play in the event of the break-up of the euro zone would be, as mentioned above, risk factors for a banking or financial crisis.

Moreover, the economic literature on currency crises has pointed to the link with banking crises (Kaminsky and Reinhart, 1999). The collapse of a monetary union in reality reflects a crisis situation for the exchange rate system, which leads to revaluations and devaluations with the over-adjustment of exchange rates, as highlighted in the previous section. The reference to the cost of banking crises thus illustrates the potentially negative effects of exiting the euro zone. However, it should be remembered that these costs correspond to an overall assessment of banking crises that does not make it possible to identify precisely the mechanisms through which the financial shock is propagated into the real economy — an assessment that would involve identifying the impact of rising risk premiums and the effect of credit rationing, where it is much more difficult to determine the uncertainty. An analysis by Bricongne et al. (2010) of the various channels through which the 2007-2008 financial crisis was transmitted suggests that a significant amount remains unexplained. Also, in the absence of a more detailed analysis, we make the assumption that the historical experiences of banking crisis are the main quantitative element that can be used to get close to the eventual negative impact — via the financial effects — of a break-up of the euro zone.

Laeven and Valencia (2012) analysed 147 banking crises in developed and emerging countries over the last few decades (1970-2011). They calculated the losses in production as the three-year cumulative loss of actual GDP relative to trend GDP [7]. For the developed countries, the cumulative loss of growth was on average 33 GDP points. During these three crisis years, the public debt increased on average by 21 GDP points (partly due to bank recapitalizations), the central bank's balance sheet increased by 8 GDP points, and the level of non-

performing loans increased by 4 percentage points. It should be noted that there was a high degree of heterogeneity in the cost of the crises, depending on the crisis and country in question. For example, the authors' assessment of the cost of the 2008 banking crisis in terms of growth following the bankruptcy of Lehman Brothers was 31 GDP points for the United States and 23 GDP points for the euro zone as a whole. Hoggarth, Reis and Saporta (2002) conducted a similar study and sought to provide robust assessments of trend GDP. They noted cumulative production losses during crisis periods ranging from 13 to 20 GDP points, depending on the indicator chosen. However, these estimates of the cost of banking crises are to be taken with caution, since they are based on numerous assumptions, in particular on the trajectories that countries would have followed in the absence of a crisis.

IV – The gains from monetary autonomy

The gains from an alternative monetary policy would depend on the new direction taken by a monetary policy that remains to be defined and that will determine the conditions for financing the economy. Such a policy would probably be ultra-accommodative due to the financial and banking instability generated by the balance sheet effects.

Evaluations of the contribution of financial conditions in France from 2014 to 2018, however, suggest that these are not the most important factor explaining the sluggishness of economic activity. Over this period, the contribution of financial and monetary conditions to GDP growth is between -0.1 and 0.2 points [8]. There is thus little gain to be expected from a new ultra-accommodative monetary policy (independently of the effects on exchange rates discussed in the first section or the impact of external pressure).

Conclusion

This text has attempted to outline the possible consequences

of a Frexit, without going into too detailed and therefore perilous quantification.

1. Contrary to what is sometimes advanced, there is little to be expected in terms of competitiveness or manoeuvring room for short-term monetary policy;
2. The main cost would come from the banking or financial crisis arising from balance sheet effects, particularly given the context of a disorderly exit.

At this stage of the analysis, it is difficult to identify the potential positive economic effects of a Frexit, while the risks of a negative impact due to financial effects seem to be very significant.

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[1] These points are to a large extent discussed in *Capital Economics* (2012).

[2] It is difficult to develop a long-term counterfactual scenario in the case of exiting the euro. We therefore focus on the short- and medium-term effects of possible transitions.

[3] We implicitly eliminate the scenario of a currency war where each country would try to gain competitiveness by devaluations that would permanently lead us away from convergence towards a real equilibrium exchange rate.

[4] The introduction of tariffs like this calls for leaving the European Union. Without developing this analysis here, it is very likely that leaving the euro zone would lead to leaving the European Union. There have been assessments of the EU's contribution to intra-European trade and growth that we are not using here in our short-term approach.

[5] Through its quantitative easing program, the ECB essentially purchases sovereign debt bonds, including French debt securities. In February 2017, the outstanding securities held by the ECB under this programme (PSPP) amounted to € 1,457.6 billion. Breaking down the purchases based on the share of the ECB's capital subscribed by the central banks of the member states, the fraction of French debt securities exceeds 200 billion euros.

[6] Getting free from the constraints of the Stability and Growth Pact could be a gain in itself. This assumes that the

constraints of the SGP go beyond simply the sustainability of the public debt demand.

[7] These evaluations show, however, that there is a high degree of heterogeneity in the assessed costs depending on the country in question.

[8] https://www.ofce.sciences-po.fr/pdf/documents/prev/prev1016/france.pdf