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RESEARCH PAPER



Time for new financing instruments? A market-oriented framework to finance environmentally friendly practices in EU agriculture*

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ABSTRACT

We observe that the actual system of support to agriculture in Europe neglects many of the existing and potential interactions in the financing chain and, for this reason, remains scarcely participated in by institutional investors. In an attempt to overcome this issue, this paper provides a theoretical framework for a market-oriented financing of agriculture in the EU, with particular emphasis on environmentally friendly practices. In more detail, the paper identifies the conditions for implementing a comprehensive originate-and-distribute securitisation mechanism for environmental loans backed by a general public guarantee. The discussion provided allows the identification of the main gaps between the target financing infrastructure and the instruments currently available in the market. In this respect, two elements would deserve a specific implementation. First, an integrated policy programme able to leverage the public spending through a balance of grants (which should support only unprofitable environmentally friendly practices) and external credit enhancer in the securitisation mechanism. Second, a specialised data set able to provide reliable environmental and financial performance indicators on different environmentally friendly investments to farmers, intermediaries and institutional investors.

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1. Introduction

The debate on how to foster sustainable agriculture and the bio-economic transition in Europe embraces different disciplines. Aspects regarding effective regulation, technological improvements, scientific research and investment flows will jointly determine the feasibility and speed of the changeover. In this paper we focus in particular on the issue of the effective financing of environmentally friendly practices. In this regard, it can be observed that the actual system of support for agriculture in Europe neglects much of the existing and potential interactions in the financing chain. In fact, it mainly aims at subsidising

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farmers to mitigate the effects of market failures (through the Common Agricultural Policy, CAP)¹ or incentivising banks to extend lending by providing guarantees or credit enhancers (mainly through the European Investment Bank schemes). Scarce or no links between the different policy instruments exist. In an attempt to overcome this oversimplified view, this study proposes a framework able to leverage the possible interactions existing in the whole financing chain, namely between farmers, financial intermediaries, institutional investors and policy makers. The main desirable output of this framework would be to attract private resources to the financing of environmentally friendly practices.

To this extent, the paper presents an analysis of the advantages and issues related to the implementation of a steered *originate-and-distribute* securitisation mechanism backed by a general public guarantee issued at the European level. The effective introduction of such a mechanism could represent a significant step towards the development of the actual subsidies-based financing in the direction of a system based on a combination of grants and market instruments.

As a matter of fact, other structured finance mechanisms could have been used to develop the framework. The choice of securitisation is mainly due to two key factors: first, the recent renewed policy relevance of this instrument, in particular as far as it concerns small and medium enterprises (SMEs) lending²; second, the extensive literature existing on the subject, which provides a robust and reliable background to assess some of the fundamental issues discussed in the paper.

A standard securitisation process allows illiquid assets (mortgages, loans, short-term credit, etc.) owned by one or more financial institutions to be pooled and transferred to an *ad hoc* vehicle which issues tradable securities backed by those assets. These securities can be transacted in the secondary market. The originating entity is hence cashed-out, while the securities issued by the vehicle are repaid through the cash flow of the original assets. Usually, an external credit enhancer is used to mitigate the risk for the final investors and create highly-rated financial instruments.³ For banks and other financial intermediaries that decide to securitise their assets, the benefits sought through this mechanism are mainly linked to the provision of new liquidity (e.g. Cardone-Riportella, Samaniego-Medina, and Trujillo-Ponce 2010; Farruggio and Uhde 2015), the management of their capitalisation through the transfer of risk and the regulatory arbitrage (e.g. Affinito and Tagliaferri 2010; Michalak and Uhde 2011; Rösch and Scheule 2011) and the realisation of profits opportunities (e.g. Cardone-Riportella, Samaniego-Medina, and Trujillo-Ponce 2010; Ahn and Breton 2014). At a systemic level, the biggest potential advantages of securitisation are to allow institutional investors to have access to otherwise inaccessible assets classes and to permit banks to free capital to be used to issue new lending to the economy (e.g. IMF 2015).

By analysing how a market-oriented financing framework backed by a securitisation mechanism can be introduced to foster environmentally friendly practices, this paper contributes to existing literature in two ways. On the one hand, it represents a first of its kind in the area of the financing of environmentally friendly practices. To the best of our knowledge, no works have been published so far as regards the application of securitisation to the specific case of European agricultural financing. On the other hand, it provides a preliminary conceptual platform to be used for further research in this field.

2. Aim and phases of the analysis

This paper assesses how a market-oriented financing framework backed by an *originate-and-distribute* securitisation mechanism can be introduced in the EU to foster environmentally friendly practices. To do that, we lead the investigation on the basis of four specific layers of analysis. First (in Section 3), we depart from others to draw the background of reference for the analysis. In this respect, we review existing contributions linked to securitisation, to SME lending (as the largest portion of the agricultural producers can be considered to be small economic agents) and to the impact of subsidies on farmers' investment choices. Then (in Section 4), we identify the fundamental features of the target financing infrastructure. To do that, our approach follows that of Ashcraft and Schuermann (2008), who analysed the specific agency problems at several points in the securitisation chain for subprime mortgages. To this extent, we analyse the main frictions existing in the financing chain linking farmers, originators, institutional investors and policy makers. When appropriate, we deepen the investigation by using simple behavioural analyses. This allows us to list the necessary preliminary conditions for a comprehensive market-oriented financing mechanism and propose a number of operational enablers to overcome potentially undesirable shortcomings. The combination of these preliminary conditions and operational enablers is what defines the target financing infrastructure. Hence (in Section 5), we assess two different intermediation scenarios: one entails transaction-based banks as loans originators, the other previews the presence of the cooperative sector. In this respect, we analyse the specific risks that might exist in each one of these scenarios. We are then able (in Section 6), to state some concluding remarks on the feasibility of the introduction of a market-oriented financing framework backed by an *originate-and-distribute* securitisation mechanism.

We are conscious of the fact that for a framework to be useful, it must have clear testable implications, so that the proposed paradigms may be supported or refuted by data. To this extent, this paper is a limited first step. Further empirical research will be needed to test the effectiveness of the framework on the ground.

3. The theoretical background

Existing research provides a vast theoretical background for the investigation. Our research is related to three main strands of literature. First, our study refers to the works analysing the potential beneficial effects of securitisation on social welfare and its inherent risks. Second, it is linked to literature concerning lending to SMEs. Finally, it is related to the works analysing the determinants of the farmer's choice to undertake environmentally friendly practices.

3.1. Potential advantages and incentives misalignment in securitisation

Securitisation allows illiquid assets to be available to institutional investors potentially operating all around the globe, while the originator of these assets may remain to a large extent a local entity. In this way, a new business model may be prompted. In fact, contrary to the traditional originate-to-hold practice, banks and other financial intermediaries can issue loans with the only aim of pooling and securitising these assets (originate-

to-distribute). In such a model, financial intermediaries maintain a central role only as the originators and initial evaluators of the credit risk, while losing their traditional role of holders and administrators of the assets. This system can produce considerable advantages all along the intermediation chain (for borrowers, intermediaries and final investors). Nevertheless, risks to social welfare may arise from the potential misalignment of the incentives of the actors involved in the process and the consequent misuse of the mechanism.

The increased provision of liquidity in the banking system is one of the obvious advantages of the securitisation and, at a single-bank level, one of the most important determinants of the decision to securitise assets. In particular, existing studies argue that a true sale securitisation⁴ leads to an effective recalibration of the bank's balance sheet composition, by disposing of illiquid assets and injecting cash (Gorton and Pennacchi 1995; Adrian, Estrella, and Shin 2010). Other authors have identified another important potential systemic advantage of securitisation in the possibility for a wider range of investors to access asset classes traditionally reserved for retail banks. In particular, this may be the case of SME lending and short-term commercial papers (Duffie 2008; IMF 2015). Likewise, consolidated literature has highlighted the contribution of securitisation to the diversification of the risk along the whole intermediation chain (Allen and Carletti 2006). The pooling and tranching processes allow the cash flow from the underlying assets to be restructured and profiled. This permits, on the one side, to mitigate idiosyncratic risk inherent to single-level loans and, on the other side, to create securities classes able to appeal to a large base of investors with different risk appetite (Caballero and Krishnamurthy 2009). Finally, literature has proved that securitisation may be an effective means to stimulate loan supply. In particular, this happens when banks use the capital freed after the sale of the assets to accept new credit risk (Altunbas, Gambacorta, and Marques-Ibanez 2009).

Despite these advantages, existing literature highlights certain risks linked to securitisation practices. To this extent, a number of works have analysed the effects of the information asymmetries and the moral hazard that may feature the relationship between originator and final investors. In fact, banks and other financial institutions may tend to accept reducing their credit standards and transfer the risk to the market. In this respect, evidence has been documented, in particular for the subprime mortgages in the US, which has been accused of triggering the financial crisis in 2007. Based on these studies, the absence of *skin in the game* (retention of part of the risk) has been the basis of a misalignment in the incentives between originators and final investors. This phenomenon has eventually caused a sensitive reduction of the quality of the underlying assets (Keys et al. 2009; Mian and Sufi 2009).⁵ For this reason, all recent regulation proposals on securitisation have included risk retention clauses concerning the originator. In more detail, the provision of maintaining a minimum nominal value of the first-loss tranche or of each of the tranches sold or transferred to investors is constantly proposed to limit opportunistic behaviours (BCBS 2014; IMF 2015; EC 2015a).

Similarly, securitisation can create undesirable effects as far as it concerns the effective monitoring of the borrowers' performances. Typically, the distance between borrowers and final investors increases in a securitisation mechanism. In addition, originators may lose the incentive to invest resources in analysing debtors' credit standing during the lending period as the cost involved in monitoring becomes higher than the potential

benefit (Pennacchi 1988; Parlour and Plantin 2008; Loutskina and Strahan 2009). In an attempt to limit the information gap and minimise the cost of collecting information on the underlying assets, final investors might be pushed into over reliance on the note assigned by the rating agencies to the securitised instruments as this information is easily available and bears no costs. Eventually, a scarce or no monitoring of the initial borrowers' performances may materialise. Consequently, the recent wave of regulation also aims at fostering due diligence for final investors and increasing transparency on the underlying assets (EC 2015a).

3.2. Features of the SMEs lending

The issue of the financing of SMEs in Europe has become one of the key points of attention for policy makers and economists, in particular in the aftermath of the financial and economic crisis. Such consideration is justified as the SMEs segment represents an important portion of the value added creation in Europe, especially in the non-financial sector.⁶ As a matter of fact, the effective financing of SMEs is an essential precondition for the health of the European economy. To this extent, small size characterises agricultural firms in many European countries (see Annex I).

Literature has highlighted a number of features that characterise the access to external funds for SMEs. Firstly, some authors have evidenced that SMEs are typically more financially constrained than large firms as a consequence of their limited access to alternative sources to bank lending and that such financial inability may represent a hurdle to their economic growth (e.g. Beck, Demirgüç-Kunt, and Martínez Pería 2009). Secondly, several works have shed light on the presence of credit limitations due to the opaqueness of the balance sheet and other relevant information that typically features SMEs. In this respect, limited information can affect the lending from institutions that base their credit decisions principally on hard, objective, and transparent data (e.g. Berger and Udell 2002), are characterised by complex hierarchical organisations (Stein 2002) and are physically distant from the potential borrowers (Bellucci, Borisov, and Zazzaro 2013). Thirdly, empirical evidence also suggests that SMEs lending may be dropped by banks in favour of plain-vanilla types of lending, such as mortgages, in an attempt to limit the negative effects of opaque information (Liu, Margaritis, and Tourani-Rad 2011). Finally, existing literature demonstrates that the quality of the relationship with the bank can play a role for SMEs in terms of cost of funding. The longer the relationship, the lower the loan rates and the fewer the loan covenants (Berger and Udell 1995).

On the other hand, abundant evidence exists consistent with the idea that relationship lending is more effective than transaction-based lending in limiting the information asymmetries between SMEs and financial intermediaries.⁷ In particular, relationship lending practices allow banks and other financial institutions to better collect and store soft information. Relationship lending institutions are hence prone to exploit this information over time, by fostering a long-term connection with the borrower (e.g. Boot 2000; Berger, Klapper, and Udell 2001). Similarly, another recognised feature of relationship lending institutions, and in particular of cooperative banks, is their resilience to monetary shocks in terms of lending supply. Literature linked to the *bank lending channel* shows that in periods of credit tightening cooperative banks are usually able to provide funds

to their clients to a higher extent than other types of lending institutions (e.g. Bolton et al. 2013; Ferri, Kalmi, and Kerola 2014; Migliorelli and Brunelli 2017).

Despite these results, the conventional wisdom that large banks have little interest in serving SMEs has collected only ambiguous findings. Although many authors have found evidence that small and niche banks may better engage with SMEs through relationship lending using soft information, while large and foreign banks tend to lend less to SMEs (e.g. Mian 2006; Jimenez, Salas, and Saurina 2009), such a view is not unanimous.⁸ In particular, Berger and Udell (2006) argue that banks can strategically decide to use a set of different lending technologies (which include both transaction-based lending technologies⁹ and relationship lending), and this choice may not be linked to the size of the bank. This can justify why, for example, the intensification of bank involvement with SMEs observed in various markets is neither led by small or niche banks, nor highly dependent on relationship lending (De la Torre, Martínez Peria, and Schmukler 2010).

3.3. Behavioural impact of subsidies for agriculture in the EU

The weight of public support for European agriculture has been historically important. Even if successive reforms have progressively reduced the incidence of the CAP on the European budget,¹⁰ the financing of agriculture in Europe still remains highly dependent on subsidies.¹¹ In this context, environmentally friendly practices have progressively gained attention. In the actual multiannual financial framework (2014–2020), the support for these practices is divided into two different budgetary envelopes. On the one side, funds are allocated as mandatory *greening* direct payments under the Pillar I.¹² On the other side, *agri-environment* and *climate* payments following the provider-targets principle are available under the Pillar II.¹³

As regards the research on the financing of environmentally friendly practices at the European level, two main aspects convey a particular relevance in our study. The first concerns the analysis of the determinants of the farmer's decision-making process. Aside from agro-climatic factors, different environmentally friendly practices have different effects on yields and land productivity (e.g. Wezel et al. 2014) and it can easily be argued that the relation between production output and the amount of subsidies represents a major decision factor in the case of market failures. To this extent, it has been observed that little economic incentives may induce farms to opt out of even mandatory *greening* payments (Schulz, Breustedt, and Latacz-Lohmann 2014).¹⁴

However, financial compensation is a necessary but not sufficient condition to push farmers to undertake environmentally friendly practices. The literature has shown that non-financial factors may also be important (Siebert, Toogood, and Knierim 2006). For example, the possibility of maintaining a specific agricultural activity and preserving the management (Espinosa-Goded, Barreiro-Hurlé, and Ruto 2010), the presence of certain qualitative attributes of the farmer and of the enterprise (Schulz, Breustedt, and Latacz-Lohmann 2014) and the expected duration of the financing programme (Kuminoff and Wossink 2010) may contribute to the farmer's decision to be engaged in a public support scheme.

A second main issue typically linked to agricultural subsidies is regarding the inherent principal-agent problem and the incentive for farmers to cheat. To this extent, the operational characteristics of the programmes as well as the type of control and sanction

systems in place are relevant. In particular, literature concerning the CAP has shown that *agri-environment* payments may provide incentives for *cross-compliance*¹⁵ based payments, while monitoring *cross-compliance* does not guarantee full respect of the other provisions (Bartolini et al. 2012). Concerning farmers' behaviour, it has been shown that farmers have incentives to cheat early over cheating late in the contract period, on the basis of differences in the expected cost of compliance (Fraser 2012) and that farmers who have to face uncertainty in their production income are more likely to comply with the whole policy provision set as a means of risk management (Fraser 2002).

4. Financing infrastructure

This paper analyses the circumstances under which a market-oriented financing framework backed by an *originate-and-distribute* securitisation mechanism can be introduced in the EU to foster environmentally friendly practices. To do that, and similarly to Ashcraft and Schuermann (2008), we assess the main frictions existing in the financing chain due to the interaction between its key participants (namely farmers, originators, institutional investors and policy makers). This allows us to identify the essential preliminary conditions for a comprehensive financing mechanism and propose some operational enablers to overcome expected undesirable outputs. The ensemble of these conditions and operational enablers is what we refer to as the target financing infrastructure.

To this extent, Figure 1 describes a simple securitisation chain having as its object environmental loans. It highlights as well the main frictions able to harm the effectiveness (in terms of farmers outreach and practices financing) and long term sustainability (in terms of appropriate management of risks) of such a mechanism.

Four main frictions exist. First, the potential misalignment of incentives between originators and final investors, which can lead to significant systemic risk through over lending and transfer of credit risk to the market. Second, the information asymmetries between farmers and originators, which can discourage banks to lend. Third, the possible market failures existing in the agricultural sector, which can push farmers not to undertake unprofitable but environmentally friendly practices. Fourth, the specific sensitivity to risk of institutional investors (risk-aversion), which can limit the market appeal of the notes issued by the securitisation vehicle. The discussion that follows deepens the analysis for each one of the abovementioned frictions.

4.1. Misalignment of incentives between loans originators and institutional investors

A misalignment of the incentives between loans originators and investors in the sub-prime mortgage securitisation chain has been one of the facilitators of the blast of the financial crisis in 2007. Fee-based remuneration for originators and transfer of the risk to the market has induced increasing over lending to risky borrowers (e.g. Keys et al. 2010).

A strong argument can be made that an alignment of the incentives in the intermediation chain is essential to avoid systemic risks. To this extent, the securitisation mechanism we assess makes no exception. A characterising feature of the financing infrastructure should be that originators maintain a certain level of *skin in the game*. In other words, originators should keep in their balance sheets a quota of the first-loss tranche or a quota of all

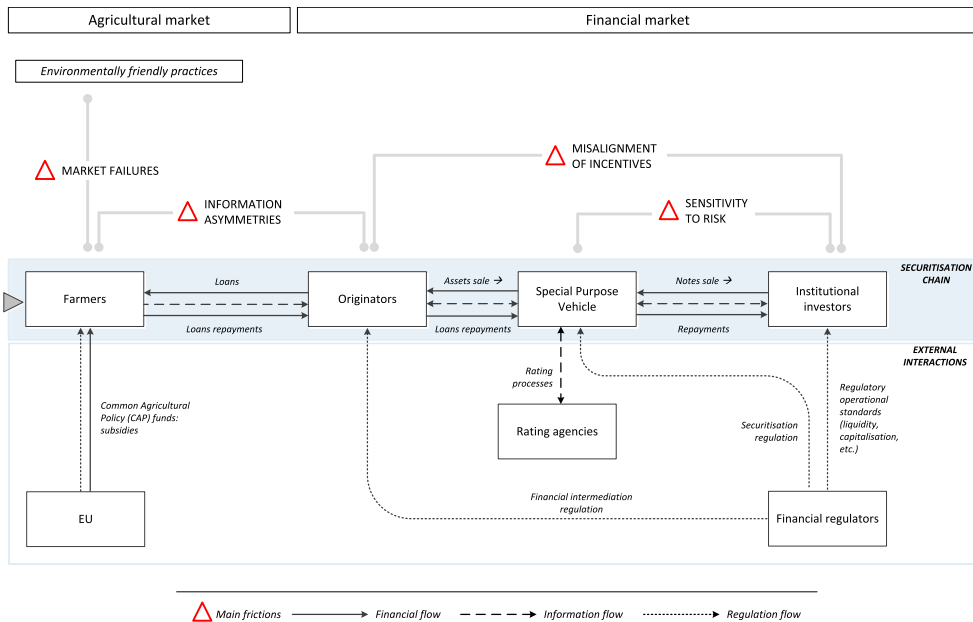


Figure 1. A simple securitisation chain for environmental loans and main frictions.

Notes: The chart shows the main actors and flows in a securitisation chain having environmental loans as underlying assets, and the main frictions able to represent a hurdle to its functioning. The latter are: the misalignment of the incentives between originators and institutional investors, the information asymmetries between farmers and originators, the market failures in the environmental sector in terms of return of the investment and the specific sensitivity to risk of institutional investors (which can have an impact on the market appeal of the notes issued by the securitisation vehicle). The figure also includes the key external actors which may have an indirect influence on the securitisation chain. In particular, this is the case of the EU bodies responsible for the CAP, the financial regulators and the rating agencies intervening in the rating processes. Source: authors' elaboration.

the tranches issued by the vehicle, as also recommended by policy makers. As this is progressively becoming an accepted regulatory standard, we do not further expand the analysis on this point.

4.2. Information asymmetries between farmers and loans originators

A traditional borrower-lender relationship requires a continuous flow of reliable information, which is essential both in the phase of credit issuance and in the phase of credit monitoring. The literature predicts that information asymmetries can induce intermediaries to let down potential borrowers. This problem is exacerbated in the case of opaque SMEs (e.g. Berger and Udell 2002), which is often the case in the agricultural market. To this extent, a lower debt exposure for small farms seems to be confirmed by data in Europe (see Annex I).¹⁶ Furthermore, an *originate-and-distribute* securitisation mechanism in which the originator maintains a certain level of *skin in the game* may convey some relevant by-products. Those are principally due to a modification in the traditional intermediary's incentives structure, which becomes more dependent on the intermediation income and less dependent on the interest income. In this respect, it can be argued that the incidence of the file cost¹⁷ and of the intermediation fee chargeable to the borrower on the marketability of the loan increases as the share of risk

transferred to the market increases.¹⁸ In more detail, a lower marketability of the loan can be predicted for a higher file cost, a lower chargeable intermediation fee and a lower amount financed.

Because of the expected information asymmetries and of the mentioned *originate-and-distribute* model by-products, a concrete risk of market failure and significant crowding-out effects may occur with respect to small farmers. In this regard, and in the absence of relevant supply-side constraints in the credit market,¹⁹ the capacity of the financing framework to guarantee an appropriate outreach mostly depends on the type of lending technology used (Berger and Udell 2006). To deepen the analysis on that point, it can be observed that any lending technology consists of a series of methods and instruments applied in each of the phases that typically compose the credit process: contact generation, borrower’s needs analysis, information collection, borrower’s creditworthiness analysis, contract formalisation, credit issuance and credit monitoring. It can be easily argued that the financing of environmentally friendly practices conveys a significant distinctiveness in the credit process. In this respect, an argument can be made concerning the fact that relationship lending would be an effective means to reduce information asymmetries and streamline at least the first three phases of the process (e.g. Boot 2000; Berger, Klapper, and Udell 2001) and that this effect would even be amplified in the case of lending institutions specialising in the agriculture sector (Figure 2).

4.2.1. Operational enablers

In this context, an element that can play a role in improving the performance of the financing infrastructure may be the enforcement of standardised contracts. The possibility to

	Contact generation	Borrower’s needs analysis	Information collection	Borrower’s credit-worthiness analysis	Contract formalisation	Credit issuance	Credit monitoring
Financial statement lending	Low	Low	Low	High	Low or medium	High	High
Assets-based lending	Low	Low	High	Low	Low or medium	High	Low
Small businesses credit scoring	Low	Low	Low	High	Low or medium	High	High
Relationship lending	Medium or high	Medium	High	Medium or high	Medium	High	High
Relationship lending – specialised institutions	High	High	High	Medium or high	Medium or high	High	High

Figure 2. Lending technologies and expected level of efficacy in the SMEs environmental lending.

Note: List of transaction lending technologies (financial statement lending, asset-based lending, small business credit scoring) adapted from Berger and Udell (2006). For financial statement lending and small business credit scoring, high levels of efficacy in borrower’s creditworthiness analysis and credit monitoring are conditioned to the presence of reliable data. For asset-based lending, low efficiency in borrower’s creditworthiness is due to limited capacity to analyse the cash generation ability of the client. For all the lending technologies, contract formalisation refers to specialised financing contracts. The 3 × 3 upper-left quadrant of the table reflects the pronounced impact of information asymmetries occurring while using traditional transaction lending technologies. Source: authors’ elaboration.

benefit from a homogeneous, recognised set of commercial standards for the financing of environmentally friendly practices might have two main advantages. On the one hand, it would rationalise the operational phases of the lending process (in particular the contract formalisation and, to a lesser extent, the phases of borrower's needs analysis and the information collection). On the other hand, it would facilitate the selection and due-diligence activity concerning the loans to securitise. In the mid-term, such types of contract are likely to be integrated in many of the prevalent lending technologies used. Therefore, a structured policy intervention would be beneficial to speed up and consolidate the adoption.

4.3. Market failures in the environmental sector (and public intervention)

Another element of the financing framework that deserves specific analysis is the impact of the expected financial return of the environmental investment on the borrower's financing choices. In this respect, it has been observed that different environmentally friendly practices may have different levels of farming integration and yields; hence, the profitability condition may not hold for all the possible investments. In these cases, farmers may be pushed to drop the environmental option as economically not viable (e.g. Schulz, Breustedt, and Latacz-Lohmann 2014; Wezel et al. 2014). Nevertheless, this behaviour may produce an undesirable outcome for social welfare.²⁰ To minimise this problem, an argument can be made in favour of allowing direct payments or other types of subsidies to farmers in order to support their income. In this way, the entity of the market failure (in terms of farmers' income loss or unprofitable market prices) is compensated by public spending.²¹ In Europe, this sustenance principle is well established and managed through a number of schemes included in the CAP provisions.

In this context, for a financing framework aimed at fostering environmentally friendly practices to be effective, integration with the relevant public support instruments seems paramount. In fact, in most of the cases beneficiaries of subsidies and borrowers will coincide. In the European perspective, it is likely that farmers will be entitled to *greening*, *agri-environment* or *climate* payments within the CAP's support schemes on the one side and will borrow money to finance environmentally friendly practices on the other.²² In an *originate-and-distribute* securitisation mechanism that has to integrate public support schemes, what merits particular attention is the incidence of the subsidies on the performances of the loans to be securitised. To this extent, it can be argued that the cash flow coming from public schemes will be used by farmers to remunerate all the production factors, including financing. The impact of subsidies on the loans' performances may therefore be twofold. First, it may play a role at the level of the overall enterprise's creditworthiness. In fact, the multiannual flow of subsidies linked to the farm's holdings and practices contributes to the expected overall cash generation of the agricultural firm. Second, it may be relevant at the level of single investment as an incremental flow of subsidies may occur following the adoption of specific environmentally friendly practices.²³ In the actual functioning of the CAP, these contributions are not negligible and are expected to grow (see Annex II). The resulting complexity of the analysis of the firm's cash flows in the environmentally friendly sector suggests again the use of an appropriate lending technology and the presence of specialised financial intermediaries. In fact, failure to overcome

opaque information and information asymmetries could lead banks or other financial intermediaries to reject potential borrowers.

4.3.1. Operational enablers

With respect to the relation between subsidy schemes and the financing framework, two operational enablers might be tested to smooth the functioning of an *originate-and-distribute* securitisation mechanism. On the one hand, a detailed and shared list of environmentally friendly practices may be established. Such a list should include information on the subsidies potentially accessible to farmers once the financed practice is undertaken. On the other hand, data concerning the environmental and economic performances of each environmentally friendly practice should be collected and made available to farmers, financial intermediaries and market investors. Ideally, these data would include information on the specific financial impact of public support. The availability of these data sets would help the functioning of the financing framework in at least three ways. First, it would represent a support for financial intermediaries in assessing the creditworthiness of the borrowers with respect to the environmentally friendly investment. Second, it would permit institutional investors to set expectations on the (environmental and financial) performances of the securitised assets. Third, these data sets could eventually be used to refine the amount of subsidies for each environmentally friendly practice. To this extent, in order to mitigate the different effects of the market failures, scarcely profitable practices might be entitled to a higher level of subsidies with respect to self-performing practices. Considering the specificity of the subject, it seems reasonable to assign these information production tasks to specialist agricultural institutes or agencies at a European or national level.

4.4. Sensitivity to risk of institutional investors

With respect to an *originate-and-distribute* securitisation mechanism, we refer to market appeal as to the willingness of institutional investors to take a position on the instruments issued by the securitisation vehicle. The theory predicts that a frontier-efficient risk-return combination, portfolio diversification prospects and the possibility to promptly cash out the investment, are the key determinants for measuring the attractiveness of a financial instrument. It seems likely that securities backed by environmentally friendly loans principally issued to SMEs may represent a quite unique asset class. In this respect, such uniqueness should attract investors in search of diversification. As far as it concerns the aspect of the liquidity of the notes, two elements should typically be taken into account: first, the presence of a secondary market and second, the possibility for the instruments to be eligible as collateral in the European Central Bank's refinancing operations. The first element does not seem to represent an issue in the actual configuration of financial markets; the second entails an appropriate structuring of the senior tranches in the securitisation vehicle.

Furthermore, in determining the attractiveness of the instruments issued by the vehicle in terms of risk-return, and in particular for institutional investors, what merits a particular attention is the external credit enhancer. In fact, from this element largely depends the possibility of issuing highly rated financial instruments. While assessing the appropriateness of an external credit enhancer, both its magnitude and the financial strength of the guarantor need to be taken into account.

4.4.1. Operational enablers

Considering the potential market for environmentally friendly practices in Europe as well as its social and political relevance, an involvement of public institutions at a European or national level as guarantors seems possible.²⁴ To this extent, a solid link between loans issued to finance environmentally friendly practices and the public guarantee on the notes issued by the securitisation vehicle, should be established and maintained. This link may be imposed through the definition of specific policy programmes, which should preview eligibility checks for the loans to be included in the securitisation mechanism. In these settings, a financing framework backed by an *originate-and-distribute* securitisation mechanism would represent an instrument of policy implementation able to calibrate the level of public support by balancing subsidies and financial instruments.²⁵ On the one side, single outperforming environmentally friendly practices should be directly financed through subsidies; on the other, the environmentally friendly investments would be supported at systemic level by means of guarantee embedded in the securitisation mechanism. Such a system would be a step towards a combination of support provided through the CAP grants and market-oriented instruments. To this extent, the leverage effect expected from the securitisation mechanism (ratio between public participation and the inflow of private resources) would represent a key desirable output of the financing framework in terms of opening the agricultural market to institutional investors.

Finally, it can be expected that the market appeal of the notes issued by the securitisation vehicle would be fostered by specific labelling. In particular, securitisations compliant with the requirements of simplicity, transparency and standardisation that incoming regulation will most probably introduce in Europe (EC 2015a) would allow a more specific positioning within the investors' choice spectrum and steer the demand of these instruments.²⁶

Figure 3 shows the main features of the target financing infrastructure as resulting from the analysis of the interactions between its participants and from the inclusion of the operational enablers discussed in this Section (in light blue).

5. Possible intermediation chains

We now introduce two possible intermediation scenarios: the first concerns banks adopting transaction-based lending; the second previews the presence of the cooperative sector. In both cases, intermediaries are expected to work within the financing infrastructure discussed. Our aim is to identify the characterising elements of each intermediation option and assess their strengths and criticalities. As a matter of fact, no impediments exist to the possibility of both intermediation channels working simultaneously. Nevertheless, differences in the effectiveness and in the efficiency may exist.

5.1. Transaction-based banking intermediation

In a financing framework backed by an *originate-and-distribute* securitisation mechanism, transaction-based banks represent a first conceptual anchor for the role of loans originators. The main drawback of exploiting transaction-based banks is the expected limited outreach of the framework in terms of farm size. Even if further research is needed on

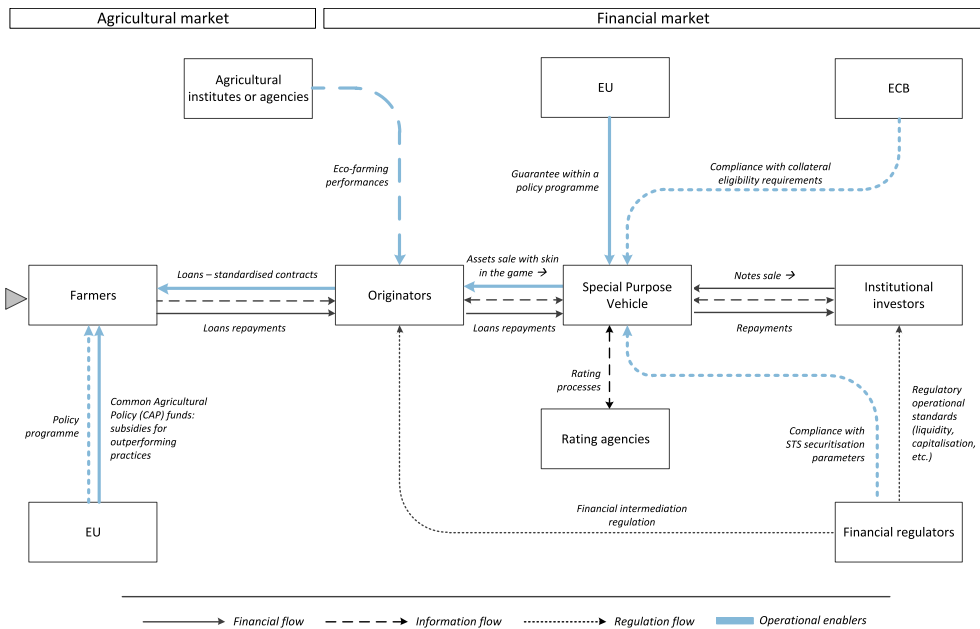


Figure 3. Target financing infrastructure.

Notes: The chart shows the target financing infrastructure. It is backed by an *originate-and-distribute* securitisation mechanism having as its object environmental loans. Some of the elements included in the chart (blue arrows) reflect operational enablers aimed at limiting the impact of the main frictions existing in a standard securitisation mechanism (the potential misalignment of incentives between originators and final investors, the information asymmetries between farmer and originator, the possible market failures existing in the environmental sector, the specific sensitivity to risk of institutional investors vis-à-vis the notes issued by the securitisation vehicle). In particular, these operational enablers are: a data set concerning eco-farming performances able to provide reliable eco-farming performances, standardised contracts to be used in the loans origination phase, an *ad hoc* programme to manage the EU contribution as a mix of guarantees and subsidies for outperforming environmentally friendly practices, the provision of clauses of risk retention for originators, the compliance of the notes issued by the securitisation vehicle with the ECB's collateral eligibility requirements and the simple, transparent and standardised (STS) securitisation parameters. Source: authors' elaboration.

this point, it seems likely that banks using transaction-based lending would have little incentive to be engaged in an *originate-and-distribute* system which includes SMEs lending. This is due to the high screening and monitoring costs compared to the little individual economic return of the loan. This limited outreach can probably only be partially mitigated by the operational enablers that may be integrated in the financing infrastructure. Nevertheless, it can be argued that the systemic relevance of this issue has to be evaluated country-wise. In fact, both the composition of the farming industry and of the banking sector (the latter in particular in terms of the presence of transaction lending technologies specialising in SMEs lending) may play a significant role in determining the final marketability of the loans and their average amount. In countries in which the average farm size is higher and the access to debt for farms easier, the transaction-based banking channel could be expected to be fairly effective in financing environmentally friendly practices within the framework described. This can be the case for countries such as Denmark, the Netherlands or the United Kingdom. On the other hand, in countries in which the farmland is dispersed and agricultural firms rely on the personal wealth of the farmer or the family more than on debt, there is the likelihood of a

reduced outreach while using transaction-based lending increases. This may be particularly so in many East-European countries and, to a lesser extent, in France (see Annex I).

5.2. Cooperative intermediation

Cooperative intermediation could overcome some of the expected shortcomings of the transaction-based lending. Nevertheless, such a system conveys some specific risks that can harm its efficiency. The notion of the cooperative intermediation we refer to is somewhat blurred. In fact, the cooperative paradigm²⁷ can be applied in a variety of structures and governance types in the agricultural sector as well as in the financial sector (e.g. Bijman and Iliopoulos 2014). With regard to the farmers' cooperatives, sensitive differences in size and participation have been observed (e.g. Gijssels and Bussels 2014). In some cases, agricultural cooperatives or federations of agricultural cooperatives have been able to reach a nation-wide scale and have been structured to embrace activities in other sectors. In Europe, the average cooperatives' market share in selling agricultural products is around 40%, and above 50% in countries such as Austria, France, Ireland, the Netherlands and the Scandinavian ones.²⁸ As in agriculture, the cooperative model is widely used in the financial intermediation sector. Financial cooperatives have been historically created with the scope to respond to the financing needs of their members. To this extent, cooperative banks in particular have reached a systemic importance in some key European countries such as Austria, France, Germany and Italy.²⁹

In our analysis, we generally refer to a cooperative operational entity and to a cooperative financial entity. In more detail, we identify the cooperative operational entity as a union of farmers in a specific territory. Its main scope is to market the agricultural output. Nevertheless, other activities may be included, such as coordination of the production factors or farmers' representation. On the other hand, with cooperative financial entity we denote a structure whose scope is to provide credit and other financing services to its members. The cooperative operational entity and the cooperative financial entity may be linked hierarchically in different ways. We first assume that they are independent from one another. Then, we analyse the case in which the operational entity can exercise a form of control or pressure over the financial entity.

The key contribution of the cooperative sector in a financing framework backed by an *originate-and-distribute* securitisation mechanism can be expected in the loans origination phase. In particular, the cooperative operational entity could facilitate the credit process by providing first-instance financial counselling services to farmers. In this context, the administrative officer of the cooperative operational entity acts as contact point between farmers and the loans officer of the cooperative financial entity. On the one hand, the administrative officer collects information on the financing schemes available, presents them to farmers and helps filling in loan documentation. On the other hand, s/he introduces potential clients to the loans officer, illustrates the farmers' financing needs and has a limited negotiation power. In the cooperative intermediation scenario, both the administrative officer and the loans officer are hence the repositories of the soft information concerning potential borrowers.³⁰

It can be argued that the contribution of this intermediation chain to the reduction of the expected market failure affecting SMEs is twofold. First, part of the file costs would be

centralised and absorbed by the cooperative operational structure. To this extent, the financial entity would bear almost no costs in the phases of contact generation, borrowers' needs analysis and information collection. Second, the soft information stored by the loans officer thanks to relationship lending could be used to improve the effectiveness of the borrower's creditworthiness analysis. As a consequence, in the cooperative intermediation scenario an increase in the marketability of the SMEs lending could be expected. Such desirable output, which still remains to be empirically verified, would also have the advantage of adding distinctiveness to the notes issued by the securitisation vehicle. In fact, in such a case the underlying portfolio could be largely composed of environmentally friendly loans issued to SMEs.

Nevertheless, in the cooperative intermediation scenario some inherent risks may exist in the case of an explicit or implicit hierarchical link between cooperative operational entity and cooperative financial entity.³¹ Such a situation may occur in particular in the case of large agricultural cooperatives or federations of cooperatives controlling a financial institution with the aim of serving their members. In such a case, conflicts of attribution may materialise between the operational and the financial entities. Furthermore, a dominant operational entity would tend to impose laxer credit standards and reduce the monitoring of the borrowers. In the mid-term, this would probably produce a deterioration of the quality of the loans issued and securitised. To limit systemic risks due to the transfer of the loans to the market through securitisation, a rigid governance structure assuring the decisional independency of the financial entity would have to be put in place and clearly communicated to the market.

6. Concluding remarks

Today a substantial lack of an in-depth appreciation of the financing chain can be observed with respect to the existing public support programmes in the agriculture sector in Europe. Depending on the programme, the focus is typically on easing market failure through subsidies or on incentivising banks to extend lending by providing guarantees or other credit enhancers. In this respect, the interaction between the different actors in the financing chain (farmers, financial intermediaries, institutional investors and policy makers) as well as the interrelation between different policy instruments is often underestimated. The main downside of this approach is regarding the efficient use of public resources and a misperception of the alternative market-based opportunities. This paper contributes to the research on how to overcome this view with respect to the specific case of environmentally friendly practices. To this extent, it discusses a market-oriented financing framework backed by an *originate-and-distribute* securitisation mechanism. The relevance of the topic relies on the possibility of identifying a new financing system based on a combination of support provided through the CAP grants and fully-fledged market instruments.

This paper is a limited first step in the consolidation of the financing framework. Further research is needed to assess its feasibility and efficacy. Nonetheless, the discussion provided allows the theoretical identification of the preliminary conditions and some possible operational enablers that together would define the necessary financing infrastructure. Namely, the latter should include:

- i. a lending technology able to limit the information asymmetries between farmers and loans originators by previewing, inter alia, standardised financing contracts;
- ii. an information platform and specific data sets able to provide reliable environmental and financial performance indicators on the environmentally friendly practices to be financed;
- iii. a set of rules and procedures indicating the level of engagement of the financial intermediary in terms of risk retention;
- iv. a securitisation mechanism able to provide appealing notes to institutional investors;
- v. a set of rules and procedures (or an ad hoc programme) indicating the level of engagement of public support through a balance of CAP grants and external credit enhancer in the securitisation mechanism.

In this context, we have also observed that the presence of the cooperative sector may, to some extent, limit part of the expected crowding-out effects affecting small and medium farmers. Nevertheless, risks may emerge in the case of cooperatives intervening both in the demand-side and supply-side of the loans' originating phase.

It can be argued that some of the elements composing the necessary financing infrastructure (in particular *ii.* and *v.*) are not in place today and would need specific implementation. The absence of such preliminary conditions and operational enablers may explain, at least in part, why the financing of agriculture sector (in general) and the environmentally friendly practices (in particular) is scarcely or not participated in by institutional investors.

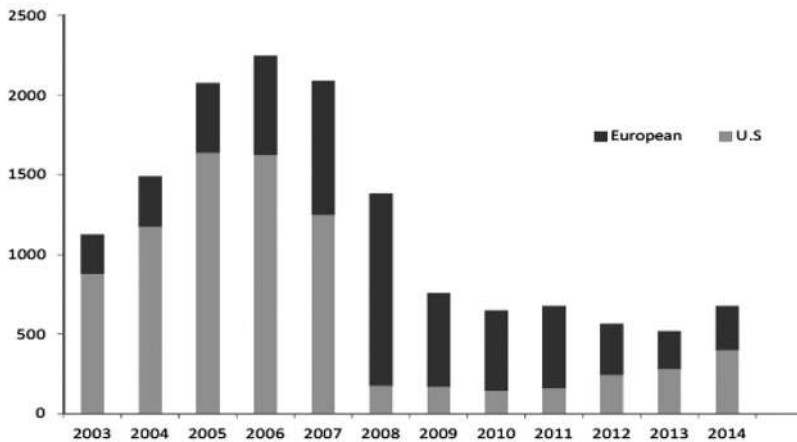
Our theoretical analyses predict specific associations and outputs for the financing framework. While comprehensive tests would be the best option, individual elements may also be tested separately. In this respect, at least three aspects need further research. First, the effective incidence of information asymmetries between originators and farmers in terms of the crowding-out effects. This test should be conducted country-wise. Second, the impact of the availability of performance indicators concerning the environmentally friendly practices on the demand for the notes issued by the securitisation vehicle. Third, the efficacy of the alternative governance structures in the case of financing through the cooperative channel. Findings confirming the outputs predicted in the paper would most probably support the framework. Findings indicating no effects would tend to refute the framework or suggest alternative operational solutions.

Notes

1. As of today, EU agricultural producers are highly dependent on direct public support. In the period 2010–2013, the average share of direct payments to the agricultural factor income amounted on average to 28%. In the same period, taking into account all subsidies, total public support in agricultural factor income reached on average 40%. Agricultural factor income represents income generated by farming which is used to remunerate borrowed/rented factors of production (capital, wages and land rents), and own production factors (own labour, capital and land). (EC 2015b).
2. Sustained by a *positive view*, the securitisation market experienced exponential growth in the years before the financial crisis. Later, it has been blamed for having contributed to the explosion of the sub-prime mortgage crisis in the US and ignited the financial contagion worldwide. In particular, the *negative view* was due to the observation that securitisation

had probably incentivised lax credit policies and poor asset quality standards (e.g. Dell’Ariccia, Igan, and Laeven 2008; Keys et al. 2010). For these reasons, in the aftermath of the financial crisis, securitisation operations have registered historically low levels of issuance both in Europe and the US. Policy makers and international organisations have recently reacted by proposing amendments to existing regulations in an attempt to contrast the misalignments observed in the securitisation chain and give new impulsion to the market (e.g. BCBS 2014). In Europe, the ongoing reform aims, in particular, to identify criteria for simple, transparent and standardised securitisation (EC 2015a).

Total private European and U.S. securitisation issuance (\$ bn)



In the figure above, European securitisation includes asset-backed securities (ABS), collateralized debt obligations, mortgage-backed securities, SMEs securitisations, public finance initiatives, and wholesale business securitisation. U.S. securitisation includes ABS, commercial mortgage-backed securities and residential mortgage-backed securities. Figures for 2014 are annualized based on data to September (IMF 2015).

3. In this regard, excess spread (the practice of issuing notes with an overall yield lower than that of the underlying assets) and overcollateralisation (the practice of issuing an amount of notes lower than the available underlying assets) are also used as sources of internal credit enhancement and to cover transaction costs linked to the securitisation operation.
4. In a true sale securitisation, the ownership of the underlying exposures is transferred or effectively assigned to a securitisation special purpose entity. In contrast, in a synthetic securitisation, the underlying exposures are not transferred, but the related credit risk is transferred by means of a guarantee or derivative contracts.
5. Nevertheless, such a phenomenon is somehow ambiguous. Albertazzi et al. (2014), on the basis of a sample of more than 1 million mortgages issued by 50 Italian banks in the period 1995–2006, found that for given observable characteristics, securitised mortgages have a lower default probability than non-securitized ones. This shows that banks may care about their reputation for not selling lemons.
6. The SMEs segment represents 58% of the value added creation and 67% of the employment in the non-financial sector in Europe. Data refers to 2014 (EC 2015c).
7. Conventionally, cooperative banks and savings institutions are considered as practising relationship lending.
8. Another factor that can induce small banks to focus on SMEs is the borrowers' concentration problem that they could suffer by lending to large enterprises.

9. Financial statement lending, asset-based lending, credit scoring, and factoring are some of the most widely used transaction lending technologies.
10. The share of the CAP within the total EU budget has decreased sharply over the past 30 years despite the successive EU enlargements (from 73% in 1985 to 39% in 2013). Such a trend has been induced by a series of successive reforms, which have mainly had the objective of incentivising a progressive transition towards a more market-oriented system. Nonetheless, in the actual multiannual financial framework (2014–2020), the CAP funds amount to over € 55 billion per year (EC 2015b).
11. Depending of the country, direct payments (hence excluding other forms of subsidy) may range from 15% or less (Cyprus, Lithuania, Malta, the Netherlands and Romania) to more than 40% (Ireland, Luxembourg, Slovakia and Sweden). Source of data: EC (2015b).
12. In this paragraph, the citations in *italics* refer directly to the vocabulary used in the CAP provisions. To be eligible for mandatory *greening* payments, farmers have to comply with a number of practices considered beneficial for the environment. In particular, this refers to the maintaining of permanent grassland, crop diversification and the presence of an ecological focus area.
13. *Agri-environment* and *climate* payments are considered within the Rural Development policy. These payments are co-financed by the European budget and national or regional authorities, which have a large autonomy in designing their own multi-annual programmes on the basis of the menu of measures available at the European level. The provider-gets principle states that farmers who sign up for environmental commitments beyond the reference level of mandatory requirements shall receive funds to cover the costs incurred and income forgone.
14. These authors have, in particular, observed that specialised arable farms on highly productive land and intensive dairy farms are most likely to opt out of *greening* and renounce their entitlements.
15. *Cross-compliance* is a mechanism that links payments to compliance by farmers with basic environmental and other standards. In the 2014–2020 multiannual financial framework, Pillar I and many Pillar II payments may be reduced in the case of non-compliance.
16. In more detail, the tendency that can be observed can be explained by (i) problems with the access to debt for small farmers and (ii) debt in charge to the farmer and not to the agricultural firm.
17. File cost includes information collection, credit worthiness evaluation and other administrative expenses linked to the origination and to the monitoring of the loan.
18. This reasoning holds in the case where the originator keeps a sufficient level of *skin in the game*. In such a case, there would not be incentive to reduce screening and monitoring costs. To shed some additional light on these aspects, we specify the predictable behavioural relations for lenders and borrowers in an *originate-and-distribute* mechanism. First, the intermediary's profitability condition at a single-transaction level is respected if:

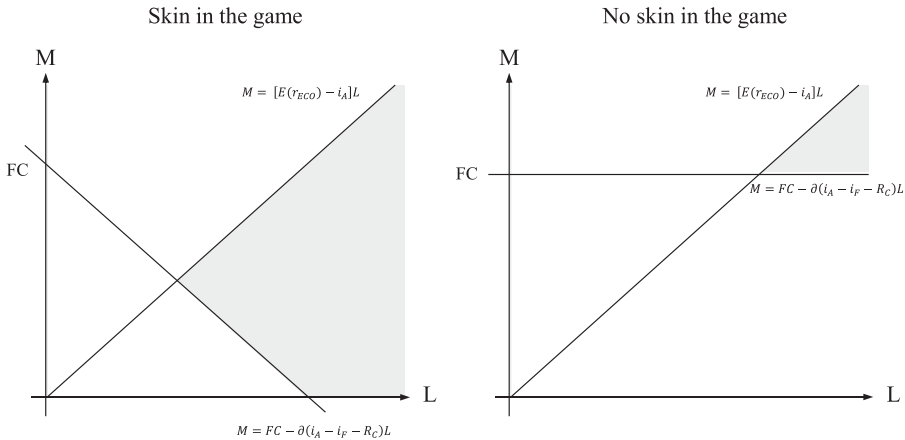
$$\partial(i_A L - i_F L - R_C L) + M - FC > 0 \quad (1)$$

where ∂ is the average portion of the risk which remains in the intermediary's balance sheet after the asset sale, i_A and i_F are respectively the interest rate charged to the borrower and the cost of funding linked to the transaction, R_C is the cost of risk directly chargeable to the loan, L represents the loan amount, M is the intermediation fee received in the case that the deal is concluded and FC represents the file cost necessary to carry on the transaction. Similarly, the borrower would enter the deal if the expected value added of the investment were positive. That is, if:

$$E(r_{\text{ECO}})L - (i_A L + M) > 0 \quad (2)$$

where $E(r_{\text{ECO}})$ is the expected net return rate of the environmental investment (not including financing costs). For the model to work, both (1) and (2) must hold. As ∂ is expected to be relatively small, the final remuneration of the financial intermediary would be mostly

dependent on its capacity to maximise $M-FC$. It can be argued that the money value of these quantities may not be proportional to the size of the loan. In fact, file-related costs, such as information collection, credit worthiness evaluation and other administrative expenses, may not vary proportionally to the amount financed. In addition, those costs are typically at the basis of mark-up mechanisms to calculate the intermediation fee. In the graphs below, the grey area represents the space of a potential deal, in which both conditions (1) and (2) are respected.



In the graph on the left, δ has a value between 0 and 1, meaning that the intermediary keeps a percentage of the risk linked to the originated loan in its balance sheet (*skin in the game* scenario). In the graph on the right, δ has a value of 0, meaning that the intermediary has transferred the entire risk exposure to the market (*no skin in the game* scenario). Comparison of the two graphs shows that the minimum possible loan amount increases when the risk transferred to the market increases. Furthermore, in a fully originate-to-distribute model ($\delta = 0$), the willingness of the originator to issue a loan depends only on the incidence of the file cost.

19. See for example the seminal work of Bernanke and Lown (1991) and the subsequent literature on the possible supply-side causes of a *credit crunch*.
20. To this extent, also note that positive externalities linked to environmentally friendly practices are typically not considered in the farmer's individual investment choice pattern.
21. In such a case, the relation (2) would be transformed to:

$$E(r_{ECO})L - (i_A L + M) + CP_{ECO} > 0 \tag{3}$$

where CP_{ECO} represents the conditioned payment. Even if relation (3) does not represent a free-market condition, it may have two advantages. On the one hand, it allows private funds to finance environmentally friendly practices; on the other hand, it may reduce the role of public intervention to the entity of market failure.

22. In our reasoning, it is not necessary that environmentally friendly practices coincide with or are restricted to the standards specified in the CAP provisions concerning *greening*, *agri-environment* or *climate* payments.
23. This is typically the case when environmentally friendly practices respect the parameters for eligibility defined in the CAP schemes.
24. In principle, specialised market players could also cover the role of external enhancers.
25. In this respect, a contemporary use of subsidies within the CAP framework and other supporting instruments at the EU level (such as a guarantee scheme or securitisation managed by the European Investment Bank or the European Investment Fund) is not forbidden, but is regulated (see, in particular, Regulation No 1303/2013 of the European Parliament and the Council of 17 December 2013). The notion of financial instrument we refer to is the one contained in this Regulation.

26. Another element that could direct the demand would probably be the compliance with the green bonds principles (ICMA 2015).
27. In this respect, it is important to underline the main peculiarities of the cooperative paradigm. Primarily, it is reflected in a unique ownership structure. Cooperatives cannot exclude new members unless motivating the reasons and, most importantly, the *one-head-one-vote* rule is in use in the decision making processes. Furthermore, cooperatives have a very limited profit-seeking nature. In fact, most of them face constraints in terms of profit distribution. Finally, the link with the territory and the mutualism principle mainly steers the cooperative activity. Normally, it has to be focused first of all towards their members and in the territory where they mainly operate.
28. See Bijman and Iliopoulos (2014).
29. In some cases, cooperative banks have experienced exceptional growth. As a consequence, those financial institutions have been transformed into universal banks (e.g. *Crédit Agricole* in France or *Rabobank* in the Netherlands).
30. The notion of a repository of the soft information we refer to is the one discussed by Berger and Udell (2002).
31. As a matter of fact, this is the typical case of captive financial institutions operating within larger industrial or commercial groups and that might be replicated in the largest agricultural cooperatives or federations of agricultural cooperatives.

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References

- Adrian, T., A. Estrella, and H. S. Shin. 2010. "Monetary Cycles, Financial Cycles, and the Business Cycle." Federal Reserve Bank of New York Staff Reports, 421.
- Affinito, M., and E. Tagliaferri. 2010. "Why Do (Or Did?) Banks Securitize Their Loans? Evidence from Italy." *Journal of Financial Stability* 6: 189–202.
- Ahn, J. H., and R. Breton. 2014. "Securitization, Competition and Monitoring." *Journal of Banking and Finance* 40: 195–210.
- Albertazzi, U., G. Eramo, L. Gambacorta, and C. Salleo. 2014. "Asymmetric Information in Securitization: An Empirical Assessment." *Journal of Monetary Economics* 71: 33–49.
- Allen, F., and E. Carletti. 2006. "Credit Risk Transfer and Contagion." *Journal of Monetary Economics* 53: 89–111.
- Altunbas, Y., L. Gambacorta, and D. Marques-Ibanez. 2009. "Securitisation and the Bank Lending Channel." *European Economic Review* 53: 996–1009.
- Ashcraft, A. B., and T. Schuermann. 2008. "Understanding the Securitization of Subprime Mortgage Credit." Staff Reports 318, Federal Reserve Bank of New York.
- Bartolini, F., V. Gallerani, M. Raggi, and D. Viaggi. 2012. "Modelling the Linkages between Cross-Compliance and Agri-Environmental Schemes Under Asymmetric Information." *Journal of Agricultural Economics* 63 (2): 310–330.
- BCBS (Basel Committee on Banking Supervision). 2014. "Revisions to the Basel Securitisation Framework." December 2014.
- Beck, T., A. Demirgüç-Kunt, and M. S. Martínez Pería. 2009. "Banking SME Around the World: Lending Practices, Business Models, Drivers and Obstacles." World Bank Policy Research Working Paper, 4785.

- Bellucci, A., A. Borisov, and A. Zazzaro. 2013. "Do Banks Price Discriminate Spatially? Evidence from Small Business Lending in Local Credit Markets." *Journal of Banking and Finance* 37: 4183–4197.
- Berger, A., L. Klapper, and G. Udell. 2001. "The Ability of Banks to Lend to Informationally Opaque Small Businesses." *Journal of Banking and Finance* 25: 2127–2167.
- Berger, A. N., and G. F. Udell. 1995. "Relationship Lending and Lines of Credit in Small Firm Finance." *The Journal of Business* 68 (3): 351–381.
- Berger, A. N., and G. F. Udell. 2002. "Small Business Credit Availability and Relationship Lending: The Importance of Bank Organizational Structure." *The Economic Journal* 112: F32–F53.
- Berger, A. N., and G. F. Udell. 2006. "A More Complete Conceptual Framework for SME Finance." *Journal of Banking and Finance* 30: 2945–2966.
- Bernanke, B., and C. S. Lown. 1991. "The Credit Crunch." *Brookings Papers on Economic Activity* 1991: 205–247.
- Bijman, J., and C. Iliopoulos. 2014. "Farmers' Cooperatives in the EU: Policies, Strategies, and Organization." *Annals of Public and Cooperative Economics* 85 (4): 497–508.
- Bolton, P., X. Freixas, L. Gambarotta, and P. E. Mistrulli. 2013. "Relationship and Transaction Lending in a Crisis." BIS Working Papers, No 417.
- Boot, A. W. A. 2000. "Relationship Banking: What do we Know?" *Journal of Financial Intermediation* 9: 7–25.
- Caballero, R. J., and A. Krishnamurthy. 2009. "Global Imbalances and Financial Fragility." *American Economic Review* 99 (2): 584–588.
- Cardone-Riportella, C., R. Samaniego-Medina, and A. Trujillo-Ponce. 2010. "What Drives Bank Securitisation? The Spanish Experience." *Journal of Banking and Finance* 34: 2639–2651.
- De la Torre, A., M. S. Martínez Pería, and S. L. Schmukler. 2010. "Bank Involvement with SMEs: Beyond Relationship Lending." *Journal of Banking and Finance* 34: 2280–2293.
- Dell'Ariccia, G., D. Igan, and L. Laeven. 2008. "Credit Booms and Lending Standards: Evidence from the Subprime Mortgage Market." IMF Working Paper, 106.
- Duffie, D. 2008. "Innovations in Credit Risk Transfer: Implications for Financial Stability." BIS Working Paper, 255.
- EC (European Commission). 2015a. "Proposal for a Regulation of the European Parliament and of the Council Laying Down Common Rules on Securitisation and Creating a European Framework for Simple, Transparent and Standardised Securitization." September 2015.
- EC (European Commission). 2015b. "CAP Post-2013: Key Graphs and Figures." March 2015.
- EC (European Commission). 2015c. "Annual Report on European SMEs 2014/2015." November 2015.
- Espinosa-Goded, M., J. Barreiro-Hurlé, and E. Ruto. 2010. "What do Farmers Want from Agrienvironmental Scheme Design? A Choice Experiment Approach." *Journal of Agricultural Economics* 61 (2): 259–273.
- Farruggio, C., and A. Uhde. 2015. "Determinants of Loan Securitization in European Banking." *Journal of Banking and Finance* 56: 12–27.
- Ferri, G., P. Kalmi, and E. Kerola. 2014. "Does Bank Ownership Affect Lending Behavior? Evidence from the Euro Area." *Journal of Banking and Finance* 48: 194–209.
- Fraser, R. 2002. "Moral Hazard and Risk Management in Agri-Environmental Policy." *Journal of Agricultural Economics* 53 (3): 475–487.
- Fraser, R. 2012. "Moral Hazard, Targeting and Contract Duration in Agri-Environmental Policy." *Journal of Agricultural Economics* 63 (1): 56–64.
- Gijssels, C., and M. Bussels. 2014. "Farmers' Cooperatives in Europe: Social and Historical Determinants of Cooperative Membership in Agriculture." *Annals of Public and Cooperative Economics* 85 (4): 509–530.
- Gorton, G. B., and G. G. Pennacchi. 1995. "Banks and Loans Sales Marketing Nonmarketable Assets." *Journal of Monetary Economics* 35: 389–411.
- ICMA (International Capital Market Association). 2015. "Green Bond Principles." March 2015.

- IMF (International Monetary Fund). 2015. "Securitization: The Road Ahead." IMF Staff Discussion Note, January 2015.
- Jimenez, G., V. Salas, and J. Saurina. 2009. "Organizational Distance and Use of Collateral for Business Loans." *Journal of Banking and Finance* 33: 234–243.
- Keys, B. J., T. Mukherjee, A. Seru, and V. Vig. 2009. "Financial Regulation and Securitization: Evidence from Subprime Loans." *Journal of Monetary Economics* 56: 700–720.
- Keys, B. J., T. Mukherjee, A. Seru, and V. Vig. 2010. "Did Securitization Lead to Lax Screening? Evidence from Subprime Loans." *Quarterly Journal of Economics* 125 (1): 307–362.
- Kuminoff, N. V., and A. Wossink. 2010. "Why Isn't More US Farmland Organic?" *Journal of Agricultural Economics* 61 (2): 240–258.
- Liu, M., D. Margaritis, and A. Tourani-Rad. 2011. "Asymmetric Information and Price Competition in Small Business Lending." *Journal of Banking and Finance* 35: 2189–2196.
- Loutskina, E., and P. E. Strahan. 2009. "Securitization and the Declining Impact of Bank Finance on Loan Supply: Evidence From Mortgage Originations." *The Journal of Finance* 64 (2): 861–889.
- Mian, A. 2006. "Distance Constraints: The Limits of Foreign Lending in Poor Economies." *The Journal of Finance* 61: 1465–1505.
- Mian, A., and A. Sufi. 2009. "The Consequences of Mortgage Credit Expansion: Evidence from the 2007 Mortgage Default Crisis." *Quarterly Journal of Economics* 124 (4): 1449–1496.
- Michalak, T. C., and A. Uhde. 2011. "Credit Risk Securitization and Bank Soundness in Europe." *The Quarterly Review of Economics and Finance* 52: 272–285.
- Migliorelli, M., and S. Brunelli. 2017. "The Transmission of the Monetary Policy in the Euro Area: The Role of the Banks' Business Model." *Annals of Public and Cooperative Economics* 88 (3): 303–322.
- Parlour, C., and G. Plantin. 2008. "Loan Sales and Relationship Banking." *The Journal of Finance* 63 (3): 1291–1314.
- Pennacchi, G. G. 1988. "Loan Sales and the Cost of Bank Capital." *The Journal of Finance* 43 (2): 375–396.
- Rösch, D., and H. Scheule. 2011. "Capital Incentives and Adequacy for Securitizations." *Journal of Banking and Finance* 36: 733–748.
- Schulz, N., G. Breustedt, and U. Latacz-Lohmann. 2014. "Assessing Farmers' Willingness to Accept "Greening": Insights from a Discrete Choice Experiment in Germany." *Journal of Agricultural Economics* 65 (1): 26–48.
- Siebert, R., M. Toogood, and A. Knierim. 2006. "Factors Affecting European Farmers Participation in Biodiversity Policies." *Sociologia Ruralis* 46: 318–340.
- Stein, J. 2002. "Information Production and Capital Allocation: Decentralized Versus Hierarchical Firms." *The Journal of Finance* 57: 1891–1921.
- Wezel, A., M. Casagrande, F. Celette, J. Vian, A. Ferrer, and J. Peigné. 2014. "Agroecological Practices for Sustainable Agriculture. A Review." *Agronomy for Sustainable Development* 34: 1–20.

Annex I: EU farms financial position (average values per farm).

	Total assets (€)	Total fixed assets (€)	Total fixed assets / Total assets	Total liabilities (€)	Long and medium-term loans (€)	Long and medium-term loans / Total liabilities	Short-term loans (€)	Farm capital (€)	Farm capital / Total assets	Cash flow (€)	Cash flow / Farm total capital
Central Europe											
Austria	452,770	357,816	0.79	50,465	37,714	0.75	12,751	354,264	0.78	41,371	0.05
Belgium	720,729	631,212	0.88	189,833	188,679	0.99	1,153	408,493	0.57	88,892	0.06
France	441,328	260,265	0.59	174,772	111,040	0.64	63,733	385,348	0.87	64,573	0.09
Germany	888,949	748,454	0.84	180,912	127,517	0.70	53,394	389,645	0.44	81,673	0.05
Luxembourg	1,151,439	976,202	0.85	267,712	222,588	0.83	45,123	663,998	0.58	94,686	0.01
The Netherlands	2,285,939	1,976,903	0.86	772,992	688,814	0.89	84,178	826,415	0.36	117,358	0.02
Mediterranean											
Croatia	154,886	141,972	0.92	3,896	3,822	0.98	74	92,182	0.60	7,348	0.02
Cyprus	179,583	144,176	0.80	8,947	8,685	0.97	263	81,863	0.46	15,699	0.08
Greece	108,009	103,258	0.96	394	273	0.69	121	57,973	0.54	13,704	0.12
Italy	389,804	281,063	0.72	2,756	2,690	0.98	66	172,262	0.44	26,997	0.06
Malta	194,903	180,331	0.93	7,855	5,797	0.74	2,058	111,899	0.57	13,152	0.06
Portugal	107,447	81,982	0.76	3,030	1,221	0.40	1,808	67,382	0.63	16,016	0.10
Spain	261,885	199,955	0.76	6,917	6,141	0.89	776	120,551	0.46	25,400	0.09
Northern Europe and UK											
Denmark	2,523,260	2,125,149	0.84	1,469,795	1,378,412	0.94	91,383	964,658	0.38	97,612	0.02
Finland	435,161	358,794	0.82	115,642	106,806	0.92	8,836	261,379	0.60	43,977	0.04
Ireland	926,583	866,954	0.94	23,471	19,551	0.83	3,920	191,327	0.21	29,281	0.02
Sweden	898,861	704,736	0.78	301,485	258,870	0.86	42,615	522,798	0.58	43,454	0.03
United Kingdom	1,807,977	1,635,705	0.90	178,882	109,570	0.61	69,311	427,585	0.24	79,101	0.03
Eastern Europe and Baltic											
Bulgaria	77,652	46,593	0.60	16,299	8,792	0.54	7,507	64,760	0.83	14,126	0.08
Czech Republic	985,969	742,030	0.75	222,094	143,709	0.65	78,385	838,356	0.85	89,349	0.03
Estonia	266,001	193,372	0.73	86,228	49,245	0.57	36,983	209,355	0.79	30,662	0.03
Hungary	172,167	105,732	0.61	28,331	10,432	0.37	17,899	129,403	0.75	22,422	0.09
Latvia	147,389	98,350	0.67	44,357	30,988	0.70	13,369	110,528	0.75	17,043	0.00
Lithuania	121,519	78,835	0.65	17,660	7,898	0.45	9,762	95,446	0.79	19,587	0.08

(Continued)

Continued.

	Total assets (€)	Total fixed assets (€)	Total fixed assets / Total assets	Total liabilities (€)	Long and medium-term loans (€)	Long and medium-term loans / Total liabilities	Short-term loans (€)	Farm capital (€)	Farm capital / Total assets	Cash flow (€)	Cash flow / Farm total capital
Poland	165,862	145,669	0.88	9,564	7,074	0.74	2,490	85,926	0.52	14,264	0.06
Romania	39,592	29,546	0.75	603	378	0.63	226	30,578	0.77	6,460	0.15
Slovakia	1,068,131	576,034	0.54	169,984	68,814	0.40	101,170	1,013,452	0.95	76,616	-0.01
Slovenia	199,035	185,353	0.93	3,598	3,506	0.97	92	107,928	0.54	12,866	0.02

Notes: Farm size can be estimated by the average Total assets. The level of leverage, which can be to some extent a proxy of the possibility of accessing debt financing, can be approximated by the metric Farm capital / Total assets (higher the value, lower the level of leverage). It can be observed that in counties such as Denmark, the Netherlands and United Kingdom a higher dimension of the firm is paired with a higher level of leverage. Conversely, in many Eastern-European countries, small dimension is paired with low debt. Concerning the first two economies in Europe, Germany and France, it can be observed that German farms are, on average, larger (about double in size) and more leveraged (almost doubly leveraged) than the French ones. For the latter, reduced size might lead to difficulties in accessing external financing. Source: authors' elaboration on data from Farm Accountancy Data Network (FADN). Data refers to 2013. The FADN sample covers approximately 80,000 holdings. They represent a population of about 5,000,000 farms in the EU, which covers approximately 90% of the total utilised agricultural area and accounts for about 90% of the total agricultural production.

Annex II: EU farms output and subsidies (average values per farm).

	Total output (€)	Total output / Total input	Total subsidies excluding on investments (€)	Subsidies on investments (€)	Environmental subsidies (€)	Balance current subsidies – taxes (€)
<i>Central Europe</i>						
Austria	75,255	1.10	18,414	1,342	6,397	18,053
Belgium	265,975	1.15	24,745	2,264	1,804	23,328
France	195,887	1.01	29,893	1,345	1,300	27,759
Germany	266,707	1.06	34,821	794	3,298	36,486
Luxembourg	192,653	0.93	44,445	15,875	9,543	54,698
The Netherlands	490,248	1.12	16,875	666	1,672	13,200
<i>Mediterranean</i>						
Croatia	23,200	1.06	4,008	–	–	3,471
Cyprus	40,769	1.18	4,906	254	758	4,801
Greece	21,783	1.27	6,538	33	67	5,847
Italy	52,951	1.41	6,436	348	677	5,092
Malta	39,675	1.25	2,764	519	243	2,712
Portugal	29,499	1.24	7,057	1,119	684	6,784
Spain	52,181	1.30	9,182	144	638	10,143
<i>Northern Europe and UK</i>						
Denmark	484,484	1.06	36,349	733	758	31,898
Finland	106,543	0.77	49,888	912	11,183	49,505
Ireland	69,754	1.05	20,276	232	2,464	19,642
Sweden	199,885	0.89	40,395	–	10,538	40,215
United Kingdom	257,008	1.02	42,059	1,365	7,390	41,162
<i>Eastern Europe and Baltic</i>						
Bulgaria	38,872	0.96	10,675	482	1,494	10,159
Czech Republic	344,709	0.89	95,128	3,537	11,322	93,080
Estonia	111,296	0.90	25,063	4,191	7,386	24,808
Hungary	65,507	1.02	15,899	790	2,444	14,932
Latvia	56,694	0.94	13,841	–	2,105	13,400
Lithuania	42,555	1.08	10,024	1,458	190	9,641
Poland	31,390	1.15	5,984	267	565	5,589
Romania	12,967	1.49	2,033	6	73	1,858
Slovakia	609,681	0.78	164,039	6,724	12,680	155,583
Slovenia	25,047	0.90	8,088	1,389	1,726	7,638
<i>Total average</i>	70,346	1.11	11,101	420	1,151	10,620

Notes: The table shows the main figures concerning the EU farms' output and the weight of the subsidies, including environmental subsidies. The latter are, on average, about 10.3% of the total subsidies (excluding subsidies on investments). Nevertheless, substantial differences exist country-wise in terms of impact of environmental subsidies over the total amount of subsidies (it can be observed a maximum of 34.7% for Austria and a minimum of 1.0% for Greece). Source: authors' elaboration on data from Farm Accountancy Data Network (FADN). Data refers to 2013. The FADN sample covers approximately 80,000 holdings. They represent a population of about 5,000,000 farms in the EU, which covers approximately 90% of the total utilised agricultural area and accounts for about 90% of the total agricultural production.