

An Economic Analysis of the Single Euro Payments Area (SEPA)

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Abstract

Under which conditions is it advantageous for countries to form a single payments area? This question is analyzed in a model of spatial bank competition to understand better the economic foundations of the Single Euro Payments Area (SEPA). An economic research perspective on the mostly informal policy debates about SEPA is developed. The analysis suggests that expectations about the positive effects of SEPA may be exaggerated as most channels for enhancing public welfare seem rather weak. Still the project may be worthwhile undertaking if the cost of creating SEPA-compliant systems is reduced by extending the time frame for the implementation phase and if the use of electronic payments is promoted.

Key Words: SEPA, optimum payments areas, payment system

JEL classification codes: G28, F02, G21

1. Introduction

The European Union is heading for the creation of a Single Euro Payments Area (SEPA) between 2008 and 2010. Driven by the European Commission the European banking industry is currently creating common standards and procedures for credit transfers, direct debits, and payment cards. The vision behind the project is to make disappear the distinction between domestic and cross-border payments in the Euro area. As basic transaction services are affected, the scale of the SEPA project is large and may be compared to the transition process from national currencies to a single common currency. However, unlike the case of the common currency or the common market, a coherent economic theory underlying the creation of a common payments area does not exist. Systematic analyses of the policy options to address possible market failure and theoretical and empirical assessments of the various channels for enhancing welfare are largely missing.¹ The goal of this paper is to go beyond the currently prevailing informal policy debates to examine the analytical foundations of the single payments area from an economic research perspective. One simple formal approach is suggested putting the analysis of SEPA into the framework of a model of spatial bank competition.² Theoretical considerations are supplemented by the available empirical evidence.

The reasons to create a single payments area are largely distinct from the reasons to create a common market or a common currency. Although the European Commission³ argues that SEPA is necessary to complete the internal market and the common currency, a closer look at this issue suggests otherwise. Among others, the following arguments have been

¹ The main analytical papers provided by the European Commission are European Commission (2002) and European Commission (2005b). No formal analysis or systematic statistical investigation is conducted in these papers. The academic literature on SEPA is very thin. See Abele et al. (2007). To the author's knowledge no formal paper analyzing SEPA exists in the literature. Frequently cited papers prepared by business consultancies are Capgemini, ABNAMRO, and EFMA (2005 and 2006). Recent research papers analyzing issues related to European payment systems are Humphrey et al. (2006), Bolt and Humphrey (2005), and Rosati and Secola (2006), for example.

² Other papers analyzing spatial models of bank competition are Wong and Chan (1993), Barros (1999) or Toolsema (2004), for example. On the importance of distance in banking see Degryse and Ongena (2005).

³ E.g., see European Commission (2002) and European Commission and European Central Bank (2006c).

raised for the creation of a common currency: abolition of exchange rate uncertainty to stimulate exports and cross-border investment; a lower risk of currency crises; no competitive devaluations between European countries; lower risk premia due to more stability; a strengthening of the European currency in the international financial system; exporting sound monetary and fiscal policy to formerly less stable European countries; a reduction of transaction costs due to the elimination of fees for exchanging currencies etc. As for the common market, the following points have been put forward in favor of its creation: more cross-border competition to break up protected inefficient national industries; more innovation due to more competition; better exploitation of economies of scale and scope in a larger European market; improving the international division of labor and improving resource allocation; reducing distortionary government interventions etc. All these benefits of a common currency and a common market are largely independent from the existence of a single payments area. A single payments area does not seem to be a prerequisite for enjoying the major benefits of a common market or a currency union. The benefits of a single payments area are more likely to be found at the microeconomic level in the payment services industry itself. Hence a microeconomic perspective is adopted in this paper.

In some sense the world today may already be considered as a single payments area. Payments can be made from (almost) any country in the world to (almost) any country. Although payment systems are predominantly organized at the national level, several connecting systems bridge these national systems. As compared to domestic payments cross-border payments tend to get processed less efficiently involving a substantially higher cost (see European Commission, 2005b). The policy initiative of the European Commission aims at replacing the diverse national systems in the Euro area by creating common standards and processes. The distinction between cross-border payments and domestic payments should vanish. A new level playing field crossing national borders should be created fostering competition, efficiency, and innovation in the European payment services industry. At the

legal level the payment services directive (see European Commission, 2005a) which is currently worked out by the EU institutions is supposed to provide a unified framework of rules defining the basic rights and obligations of the participants in the future pan-European payment system. Although the creation of the single Euro payments area involves high initial expenses, the European Commission⁴ argues that by following best practice substantial cost savings can be achieved. The cost of the payment system which currently amount to about 2-3 percent of GDP per year could be halved within about ten years.

From an analytical perspective the decision about the creation of a single payments area can be considered as the choice of national banking systems between a high initial investment to create a unified system reducing the cost of cross-border transactions or a low initial investment (which may be zero if the status quo is simply preserved) and higher costs of cross-border transactions due to a lack of integration of payment systems. In section 2 this decision is analyzed in a model of spatial bank competition.

Apart from bringing down directly the cost of cross-border transactions common standards and processes potentially open up also other channels for enhancing welfare. Competition among banks and back-office transaction services providers may rise and users may enjoy special benefits from the new system. These channels are analyzed in sections 3 and 4. It is shown that banks alone would not decide for the creation of a single payments area even if it increased total welfare because they bear most of the cost but have little benefit. Hence public intervention may be justified.

A preliminary empirical assessment of the various possible channels for enhancing welfare shows that most of them may be weak in the Euro area. The pure single payment area effect may amount to cost savings being equal to about 0.2 percent of GDP per year. Hence the expectations about the economic benefits from SEPA seem exaggerated. The impact of SEPA may be greater if features of cost reduction initiatives successfully implemented in

⁴ See European Commission (2005b), p. 10 and p. 65.

some countries at the national level are strengthened. Section 5 concludes with a discussion of the results.

2. Higher Welfare Due to More Efficient Cross-Border Transactions

A single payments area may increase welfare by enhancing the efficiency of cross-border transactions. To analyze this issue a linear Hotelling model adapted for the payment industry is considered. Suppose there are two banks denoted as $B1$ and $B2$, each located at one end of the $[0,1]$ interval. Bank customers requiring transaction services are evenly distributed between the two banks across the interval. Their position determines the transportation cost for going to a bank. At point x on the interval the transportation cost of going to bank $B1$ equals tx . The transportation cost of going to bank $B2$ equals $t(1-x)$. As is often the case, the transportation costs should be understood rather in the general sense of representing costs of agents to deal with market imperfections rather than transportation costs in a narrow sense.

It is assumed that everybody has a bank account such that the issue of optimally balancing a payment network does not arise. Each bank customer conducts one transaction.⁵ A share of a of the bank customers conducts a domestic transaction ($0 < a < 1$). A share of $1-a$ conducts a cross-border transaction. All transactions are of the same size. Each bank customer obtains a benefit b from conducting his transaction. Bank $B1$ charges f_1 per domestic transaction and f_1^* per cross-border transaction, bank $B2$ charges f_2 domestically and f_2^* cross-border.

Bank customers choose the bank from which they obtain a higher benefit net of transportation costs and transaction fees. A customer conducting a domestic transaction is indifferent between going to bank $B1$ or $B2$ if it holds that $b - tx - f_1 = b - t(1-x) - f_2$. From this equation follows that he is located at point $x = (t + f_2 - f_1) / 2t$. In a symmetric

⁵We abstract from the specific features of credit transfers, direct debits or payment cards which are the focus of SEPA. It is simply assumed that all these are transaction services which customers buy from banks.

equilibrium with $f_2 = f_1$ x equals 0.5. A customer conducting a cross-border transaction is indifferent between going to bank $B1$ or $B2$ if it holds that $b - ty - f_1^* = b - t(1 - y) - f_2^*$. Hence he is located at point $y = (t + f_2^* - f_1^*) / 2t$. In a symmetric equilibrium with $f_2^* = f_1^*$ y also equals 0.5.

The cost of the banks for conducting domestic and cross-border transactions depends upon the payment system. Two regimes are possible. The first regime can be considered as the case of a single payments area. Both banks have to invest a high fixed amount H initially to create common standards and procedures.⁶ Under this regime the variable cost per cross-border transaction can be reduced to c_1^* , the cost for a domestic transaction equals c_1 .⁷ Under the second regime which may be considered as the status quo or a smaller-scale national reform scenario⁸ an initial low investment of L (which can be equal to zero) has to be made by each bank, leading to variable costs c_2 per domestic transaction and c_2^* per cross-border transaction. All these costs are assumed to be the same for the two banks. It holds that $H > L$ and $c_1^* < c_2^*$. It is also assumed that $c_1 \leq c_2$ such that the marginal cost of domestic transactions does not rise due to the reduction of the cost of cross-border transactions. This assumption will be further justified in section 4 as advocates of a single payments area often argue that the cost of domestic transactions will be positively affected by such a system.

The profit for bank $B1$ in the single payments area regime Π_H equals:

$$\Pi_H = \mathbf{a}(f_1 - c_1)(t + f_2 - f_1)/(2t) + (1 - \mathbf{a})(f_1^* - c_1^*)(t + f_2^* - f_1^*)/(2t) - H. \quad (1)$$

⁶ Generally, for the analysis of a single payments area one would have to consider at least two countries. However, it is assumed that the other country is symmetric to the one considered such that total welfare is just twice the welfare in one country. Hence it is sufficient to analyze just the payment system in one country.

⁷ See Humphrey et al. (2000) for a discussion of the cost and benefits for banks implementing new technologies.

⁸ In the following text this second scenario will simply be called the status quo scenario.

Taking the partial derivative of the profit function with respect to f_1 and setting it equal to zero yields an optimal domestic fee $f_1^{opt} = (f_2 + t + c_1)/2$. Hence in a symmetric equilibrium with $f_1^{opt} = f_2^{opt}$ the optimal domestic fee equals $c_1 + t$. Analogously the optimal cross-border fee $f_1^{*opt} = f_2^{*opt}$ equals $c_1^* + t$.

For assessing the welfare effects of a single payments area a welfare measure is required.⁹ In the context of the model developed the sum of consumer and producer surplus, i.e. the sum of the surplus of bank customers and of bank profits is considered. The partial equilibrium framework implies that the payment services industry is supposed to have negligible real effects on the rest of the economy.

The surplus of the customers of bank $B1$ conducting domestic transactions equals:

$$\mathbf{a} \int_0^{0.5} b - tx - (c_1 + t) dx. \quad (2)$$

Evaluating this integral yields $\mathbf{a}((b - c_1)/2 - t5/8)$. Analogously, the surplus of customers of bank $B1$ conducting cross-border transactions equals $(1 - \mathbf{a})((b - c_1^*)/2 - t5/8)$. Inserting the equilibrium values into the profit function of bank $B1$ yields an equilibrium profit of $t/2 - H$ in the single payments area regime and a profit of $t/2 - L$ in the status quo regime. Hence total welfare in a single payments area W_H equals

$$\begin{aligned} W_H &= 2\mathbf{a}[(b - c_1)/2 - t5/8] + 2(1 - \mathbf{a})[(b - c_1^*)/2 - t5/8] + 2(t/2 - H) = \\ &= \mathbf{a}(c_1^* - c_1) + b - c_1^* - t/4 - 2H. \end{aligned} \quad (3)$$

⁹Berger et al. (1996) provide an analytical framework for research on payment systems also relying upon welfare analysis. Many other researchers and the European Commission reduce the analysis to cost considerations, thus aiming at a reduction of the cost of payment systems.

Total welfare in the status quo regime W_L equals

$$\begin{aligned} W_L &= 2\mathbf{a}[(b - c_2)/2 - t5/8] + 2(1 - \mathbf{a})[(b - c_2^*)/2 - t5/8] + 2(t/2 - L) = \\ &= \mathbf{a}(c_2^* - c_2) + b - c_2^* - t/4 - 2L. \end{aligned} \quad (4)$$

Comparing the welfare in the single payments area regime to the status quo regime shows that

$W_H > W_L$ if the following condition holds:

$$2(H - L) + \mathbf{a}(c_2 - c_1) < (1 - \mathbf{a})(c_2^* - c_1^*) \quad (5)$$

For $\mathbf{a} = 1$ it is always true that the status quo scenario yields higher welfare than the single payments area scenario. In this case the marginal cost advantage in a single payments area does not matter because no cross-border transactions take place. The higher initial cost of the single payments area regime tilts the balance towards the status quo. On the other hand, if the share of cross-border transactions is high enough, the marginal cost advantages of the single payments area may outweigh the higher initial cost. In this case indeed the single payments area may yield higher welfare for society. Note that the profit per bank equals $t/2 - H$ in the single payments area regime and $t/2 - L$ in the status quo regime. Hence banks will always prefer the status quo even if total welfare rises in a single payments area. They have to pass on the cost advantages to bank customers by lowering prices whereas they bear the high initial setup cost.

As a conclusion, a single payments area can increase welfare if the share of cross-border transactions is high enough such that the associated cost advantage per transaction prevails over the high initial setup cost. Government intervention is necessary to realize this welfare gain because banks alone would not find it profitable to create such a system. On the other hand, if the share of cross-border transactions is low and the initial setup cost for a single

payments area is substantial, welfare is higher under the status quo regime. In this case the privately optimal decision coincides with the socially optimal decision.

2.1 Assessing the Welfare Channel Relying Upon Cost Reductions for Cross-Border Transactions

The welfare channel relying upon a reduction of the cost of cross-border transactions is probably the most obvious channel for enhancing welfare in a single payments area. However, for this channel to be effective a sufficiently high volume of cross-border transactions is required. In the Euro area the share of cross-border transactions equals about 3 percent.¹⁰ Although it remains an issue for future research to determine more exactly the critical volume of transactions for a single payments area to be welfare enhancing, this share appears to be low. Domestic transactions are by far the dominant type of mass payments in the Euro area. It does not seem imperative to create a single payments area to achieve cost reductions for a fairly rare type of transactions. Accordingly, also the European Commission stresses the importance of welfare effects arising from other channels.

3. Higher Welfare Due to More Cross-Border Competition among Banks

A single payments area can have other effects upon welfare than a mere cost reduction for cross-border transactions. Banks and bank customers may find it difficult to conduct transactions across borders as long as payment systems are organized along national lines. A single payments area should reduce the entry barriers for offering transaction services in another country. Also bank customers may be more inclined to use foreign banks for transaction purposes if the basic system is the same as in their home country. Hence in this section a situation is considered in which a foreign bank with a favorable cost structure offers payment services in the domestic market. Bank customers make use of the services of this

¹⁰ See European Commission (2005b), p. 19.

foreign bank. It is not necessary to specify whether the bank physically enters the domestic market or whether it just offers transaction services from abroad for domestic transactions (e.g., through e-banking).

The model of spatial bank competition is adapted for the purposes of this section. Following the discussion of the previous section the parameter α is set equal to 1. Hence a situation is considered in which only domestic transactions are conducted¹¹ Again a continuum of bank customers demanding transaction services is considered. They are evenly spread across the $[0, 1]$ interval. A domestic bank exists at each end of this interval. Bank $B1$ is located at point zero and bank $B2$ is located at point one. A bank customer at point x on the interval incurs a transportation cost of tx for going to bank $B1$ and a transportation cost of $t(1-x)$ for going to bank $B2$ if no other bank exists on the interval. The bank customers on the interval and the two banks $B1$ and $B2$ belong to the domestic market.

As a new feature in this section a foreign bank denoted as $B3$ is located at point $1/2$ on the interval. The bank has a cost advantage because the cost per transaction is c_3 whereas for domestic banks this cost equals c . It holds that $c_3 < c$. Hence a business motive may exist for the foreign bank to do business with domestic customers. However, the new competitor faces some difficulties when dealing with foreign customers. First, setup costs denoted by S arise when the foreign bank starts business with clients in another country. This setup cost is particularly high if the bank decides to physically enter into the foreign market. Furthermore, domestic bank customers face a higher transportation cost when going to the foreign bank. An agent located at point x between zero and 0.5 incurs a transportation cost of xt when going to bank $B1$ and a cost $(0.5-x)t^*$ when going to the foreign bank ($t^* > t$). An agent located at point y between 0.5 and 1 incurs a transportation cost of $(y-0.5)t^*$ when going to bank $B2$ and a cost $(1-y)t$ when going to bank $B2$. The transportation cost will be particularly high if the

¹¹ If a foreign bank is used to conduct a transaction of an agent located on the interval, this is called a domestic transaction in this section although technically the transaction process may involve a cross-border transaction from the bank in the foreign country to the domestic market.

foreign bank does not establish a physical presence in the domestic market. In any case each domestic customer switching to the foreign bank incurs a switching cost equal to s because switching to a new bank is typically associated with economic hurdles. The following condition must hold such that a domestic customer located at point x between zero and 0.5 finds it attractive to go to the foreign bank $B3$ rather than the domestic bank $B1$ ($B1$ charges the bank customer f_1 per transaction, $B3$ charges f_3)¹²:

$$b - t^*(0.5 - x) - f_3 - s > b - tx - f_1. \quad (6)$$

If the foreign bank demands a lower fee due to its cost advantage and if switching costs and transportation costs for traveling to the foreign bank are not too high, domestic customers will find it advantageous to conduct their transactions at the foreign bank. From inequality (6) also follows that a bank customer between zero and 0.5 is indifferent between bank $B1$ and $B3$ if he is located at point $x = (f_3 - f_1 + s + t^*/2)/(t + t^*)$.¹³

The profit of bank $B1$ equals:

$$\Pi_{B1} = (f_1 - c)[(f_3 - f_1 + s + t^*/2)/(t + t^*)] - H. \quad (7)$$

Deriving this function with respect to f_1 and setting it equal to zero yields an optimal fee being equal to $(f_3 + s + c + t^*/2)/2$. This expression is also the optimal fee of bank $B2$ because the model is symmetric with respect to $B1$ and $B2$. Using this symmetry property the profit of bank $B3$ can be written as:

¹² The case is not considered in which the foreign bank pushes the domestic banks entirely out of the market.

¹³ This condition also ensures that part of the bank customers between 0.5 and 1 decide to use the foreign bank.

$$\Pi_{B3} = 2(\mathbf{f}_3 - c_3)[0.5 - (\mathbf{f}_3 - \mathbf{f}_1 + s + t^*/2)/(t + t^*)] - S. \quad (8)$$

This expression does not account for the profit earned by bank $B3$ in its home country. It is assumed that the bank does not take into account any initial fixed cost for creating the systems required for a single payments area because it has already made this investment in its home country. Deriving the profit function for $B3$ with respect to \mathbf{f}_3 and setting this derivative equal to zero yields an optimal fee being equal to $(t/2 + \mathbf{f}_1 + c_3 - s)/2$. Inserting the optimal value for \mathbf{f}_1 into this expression yields an optimal value \mathbf{f}_3^{opt} being equal to:

$$\mathbf{f}_3^{opt} = t/3 + t^*/6 + 2c_3/3 + c/3 - s/3. \quad (9)$$

Analogously one can insert for \mathbf{f}_3 and derive the optimal value \mathbf{f}_1^{opt} as

$$\mathbf{f}_1^{opt} = t/6 + t^*/3 + 2c/3 + c_3/3 + s/3. \quad (10)$$

Using \mathbf{f}_1^{opt} and \mathbf{f}_3^{opt} the point x^{opt} can be derived at which a bank customer between zero and 0.5 is indifferent between $B1$ and $B3$ in equilibrium:

$$x^{opt} = (1/3)(s + t^* + t/2 + c_3 - c)/(t + t^*). \quad (11)$$

Based upon the equilibrium values derived above total welfare can be calculated. From the derivation in the Appendix it can be seen that total welfare in the single payments area scenario equals

$$W^H = x^{opt} [4f_3^{opt} + t^* + 2s - 2c - 2c_3] - (x^{opt})^2 (t + t^*) + b - s - c_3 - t^* / 4 - 2H - S. \quad (12)$$

This welfare can be compared against the total welfare W^L in a scenario where only $B1$ and $B2$ exist and no foreign bank offers payment services for bank customers in another country. Again the derivation is shown in the Appendix.

$$W^L = b - c - t / 4 - 2L. \quad (13)$$

An interesting case is the benchmark case in which the foreign bank faces no setup cost ($S=0$), domestic customers can switch banks costlessly ($s=0$) and the transportation cost for going to a domestic bank is equal to the transportation cost for going to the foreign bank ($t = t^*$). Hence the foreign bank could enter without facing any frictions related to the entry into a foreign market. In this case welfare W^F is shown in the Appendix to equal

$$W^F = b - (c + c_3) / 2 - t / 8 - 2H. \quad (14)$$

Comparing W^L with W^F shows that for $H-L$ being sufficiently small the single payments area can enhance welfare because the new efficient competitor increases competition and brings down prices. However, when the frictions of entering a foreign market are taken into account, it is not clear that W^H is greater than W^L or that condition (6) is fulfilled such that domestic customers find it indeed attractive to conduct their transactions via a foreign bank. Also note that domestic banks $B1$ and $B2$ would not privately agree to form a single payments area with the efficient foreign bank $B3$ because their profits tend to be lower.¹⁴ In the general case the profit of bank $B1$ equals $(f_1^{opt} - c)^2 / (t + t^*) - H$, in the case without foreign entry

¹⁴ It is assumed that all banks have to agree to the creation of a single payments area for the project to be realized.

frictions it equals $t/8H$. Hence if a single payments area is welfare enhancing public intervention may be justified. However, if the creation of a single payments area and the frictions associated with the entry into a foreign market involve a high cost, the socially optimal and the privately optimal decision coincide. A single payments area may not even be viable because neither domestic customers nor foreign banks want to deal with such severe frictions and hence entry does not occur in the first place.

3.1 Assessing the Welfare Channel Relying Upon Cross-Border Competition

Whether cross-border competition among banks is an effective channel for enhancing welfare in a single payments area critically depends upon the importance of foreign entry frictions. Unfortunately, switching costs, setup costs, and transportation costs are not easily observable. However, the behavior of banks and bank customers can be observed. If these frictions are severe, neither foreign banks will offer transaction services in other markets nor will bank customers use foreign banks to conduct domestic transactions. Of course, other reasons than the ease of conducting transaction services may matter for these decisions. As long as they lead to the outcome that foreign banks are used/not used for domestic transactions, the implications for the effectiveness of cross-border competition to enhance welfare in a single payments area remain the same.

As far as the inclination of bank customers to use foreign banks for conducting domestic transactions is concerned it is interesting to look at the impact of regulation 2560/2001.¹⁵ This regulation required banks to apply the same charges for cross-border and comparable domestic transactions in the EU. As research conducted by the European Commission suggests, substantial price differences exist between the various EU countries.¹⁶ Hence after the implementation of regulation 2560/2001 one could have conducted domestic transactions more cheaply by opening a bank account in a low-price country and transferring

¹⁵ See European Commission 2006d)

¹⁶ See European Commission (2005b), European Commission (2006a), and European Commission (2006b).

money cross-border to a domestic recipient at the cheaper domestic rate of the foreign bank. If bank customers were price sensitive and the cost of overcoming frictions for dealing with a foreign bank were low one should have observed a substantial concentration of transaction volumes in the low price countries and/or a reduction of price differentials in response to the new competitive pressure. No major changes could be observed, however. This was also one reason for the European Commission to go one step further and start the project of a single payments area. From this perspective the inclination of bank customers to use foreign banks for conducting domestic transactions seems to be low.

If retail bank customers do not shop across borders for cheaper transaction services foreign banks would have to enter domestic markets to make their services more accessible to domestic bank customers. This question can be studied empirically. The available literature on this topic unanimously concludes that retail banking markets – which matter for mass payment systems – are regional markets and will most likely remain to be local despite many past and future regulatory changes to lower entry barriers.¹⁷ The main reasons are that asymmetric information problems are particularly severe in retail banking which can most efficiently be solved at the local level. Also trust and confidence of retail customers in their banks matter which is highest with local banks. As far as cross-border operations of banks are concerned cross-border servicing is rare. As for cross-border mergers only a few deals between larger European banks have taken place. Hence if banks decide to operate in foreign retail markets at all they tend to take over existing banks rather than founding de novo banks abroad. A takeover by a foreign bank does not increase the number of competing banks in a national market, however, and existing business practices tend to get perpetuated.

Cross-border competition among banks may be more effective in the case of larger multinational corporations processing high volumes of retail payments. Their preferred transaction services providers may follow them when doing business in other countries such

¹⁷ For example, see Dermine (2006), Freixas, Hartmann, and Mayer (2004), Degryse and Ongena (2004), and Manna (2004).

that foreign banks effectively start processing nondomestic transactions. Foreign market entry frictions should play a smaller role in this case. Common SEPA standards and processes should substantially simplify such activities. One caveat may be that already now large multinational corporations have sophisticated systems for processing payments in an effective manner. Also they typically have negotiated more favorable terms with banks compared to those applicable to retail customers. Hence the benefits from additional cost reductions may be limited considering also the cost of adapting their systems.

If bank customers do not shop abroad for cheaper transaction services and if banks operate across borders in retail markets mainly by taking over existing banks it is rather questionable whether more cross-border competition among banks due to a single payments area is a strong channel for enhancing welfare. The case may be somewhat different for larger corporations whose preferred banks follow them abroad.

4. Other Channels for Enhancing Welfare in a Single Payments Area

Even if the share of cross-border transactions is low and cross-border competition for domestic transactions services may be weak, other channels for enhancing welfare can exist in a single payments area. More competition among back-office transaction services providers or special benefits for businesses and private users may still make such a project attractive under a social welfare perspective. However, because a closer examination of these issues partly goes beyond the framework of the model of spatial bank competition, they are discussed more briefly in the following two subsections of this paper.

4.1 Higher Welfare Due to Higher Efficiency and More Competition among Back-Office Transaction Services Providers

Depending upon the specific payment system considered, various firms provide essential transaction services to banks. Because these services are back-office services, they tend not to

be transparent for bank customers. Still, they critically influence the cost and the quality of the services banks offer to their clients. E.g., in the case of payment cards acquirers and processors are key for the functioning of these systems. Processors take care of the physical infrastructure of the card system and provide basic data services. Acquirers deal with merchants and establish the communication between merchants and banks, thereby performing essential functions for clearing and settlement. In the case of credit transfer and direct debit systems the role of clearing houses or other clearing arrangements such as bilateral netting is key. They support the clearing and settlement of transactions between banks.

The basic idea of the European Commission is that in a single payments area common standards allow to increase the efficiency of such systems (e.g., by achieving higher scale economies) and to create more competition among firms formerly separated by national borders (see European Commission, 2005b). From the point of view of banks this should mean that the cost of providing transaction services to customers is lowered. Even though the specific operations of back-office transaction services providers remain a black box in this paper, one can study the impact of lower costs for banks in the spatial model of bank competition. Similar to equation (13), total welfare W^N in a national banking duopoly¹⁸ existing in a single payments area equals

$$W^N = b - c - t/4 - 2H. \quad (15)$$

A reduction of c interpreted as a cost reduction due to more back-office competition of transaction services providers may increase overall welfare if the initial costs of creating a

¹⁸ The case of a national duopoly arises if only domestic transactions are considered as argued in section 2 and if cross-border competition is weak as argued in section 3.

single payments area are not too high.¹⁹ Banks would not support the creation of a single payments area even if it were socially beneficial because the profit of a bank equals $t/2-H$ in the single payments area but $t/2-L$ under the status quo regime. Hence, to the extent this channel for increasing welfare in a single payments area is effective, public intervention may be justified. On the other hand, if this channel is weak, the privately optimal and the socially optimal decisions coincide.

As far as back-office services for credit transfers and direct debits are concerned, in most countries clearing houses perform key functions for the clearing and settlement of such transactions between banks. Typically, clearing houses for domestic mass payments tend to be centralized institutions in which banks and sometimes also public authorities (e.g., central banks) participate. The existing empirical research mainly relies upon the analysis of the clearing house system run by the US Federal Reserve System. It suggests that substantial economies of scale exist for automated clearing houses.²⁰ In Europe economies of scale would have to be achieved by bundling transactions from the formerly national clearing houses in a smaller number of pan-European clearing houses such as STEP2. However, resistance may be expected from some national clearinghouses and it is not yet sure that a pan-European clearinghouse can achieve the transactions volumes necessary for bringing down costs such that it can compete with national clearing houses for their domestic mass payments. Under an optimistic scenario some consolidation among clearing houses takes place to achieve higher economies of scale without compromising competition in Europe. The cost reductions to be achieved from exploiting the economies of scales of consolidating clearing houses seem to be limited, however, compared to other efficiency improvements because several small European countries could very substantially reduce the overall cost of their payment systems through purely domestic initiatives.

¹⁹ Such a simplified assessment of welfare does not take into account any profit reductions for back-office firms.

²⁰ For example, see Hancock et al. (1999), Bauer and Ferrier (1996), and Adams et al. (2004).

The case of payment cards is somewhat different. Due to the SEPA-requirement to make payment cards usable in the entire Euro area a sharp consolidation process has to take place affecting particularly national debit card systems. Whereas for the large international networks Mastercard and VISA SEPA compliance is relatively easier to achieve, these national schemes basically face the choice between joining one of the international networks or forming a European alliance with other national schemes. Indeed, EAPS, the Euro Alliance of Payment Schemes has been founded in 2006 to achieve this goal. Hence, most likely three schemes will dominate the European payment cards industry under SEPA. Many industry experts expect that cross-border competition among acquirers and processors is likely to increase once national boundaries have fallen. Competition within the payment card systems is likely to rise which might positively affect efficiency.

Two caveats should be kept in mind. First, a high level of intrasystem competition does not necessarily mean lower interchange fees. The U.S. system is an example of such a case where interchange fees (which essentially determine the cost of the system for merchants) have been rising in recent years.²¹ Second, even if the efficiency gains in the payment cards industry are substantial, payment card transactions amount to less than 1% of the value of total transactions.²² Hence the overall impact on the costs of the payment system in an economy is limited.

4.2 Higher Welfare Due to Special Benefits for Businesses and Private Users

SEPA may offer special benefits for users, particularly for firms. For example, it may become easier for businesses operating across borders to integrate their corporate payment infrastructure and processes more efficiently. The number of accounts might be reduced, payments could be bundled and directed to the most efficient service providers. Liquidity management might be conducted more efficiently. The new standards also make a fully

²¹ See Weiner and Wright (2005).

²² See European Central Bank (2006), Table 9.2.

electronic processing of payments easier than in some currently existing national systems. Again, the specific ways how benefits might be increased for private clients due to a single payments area remains a black box. But the impact of higher benefits for customers on social welfare can be illustrated in the spatial model of bank competition. Similar to equation (15), total welfare W^N in a national banking duopoly existing in a single payments area equals

$$W^N = b - c - t/4 - 2H. \quad (15)$$

Clearly, an increase of b interpreted as an increase of the benefits of transactions services for bank customers may increase overall welfare if the initial cost of creating a single payments area is not too high.²³ Just as in the preceding section, banks would not support the creation of a single payments area even if it enhances social welfare because their profits would go down.

Assessing the importance of this channel for increasing welfare in a single payments area is not easy due to the complexity of the underlying phenomena. However, several observations can be made. First, special benefits for private retail customers appear to be more limited because their number of bank accounts is low and liquidity management is of little importance. Second, small and medium-sized enterprises also have less complex payment structures such that the potential for benefiting from streamlining their payment processes is limited. Also they tend to be most dependent on a small number of (local) banks. This dependence may also reduce the opportunities for shifting around transaction volumes to other institutions. Third, as already mentioned in section 3.1 large multinational corporations possess already sophisticated payment management systems. They have special deals with banks for conducting payments more cheaply. Additional benefits from SEPA may exist but are probably limited relative to the already high efficiency of their existing payment

²³ If banks have a special role in realizing the additional benefits, new sources of bank revenue may arise which are ignored in this section.

management systems and the cost of adapting them for SEPA. Also there is an upper limit of €50.000 on SEPA transactions such that larger sums cannot be transferred. One should not conclude from these observations that there are absolutely no extra benefits for bank customers from SEPA. But on average several factors seem to limit those benefits.

4.3 Welfare, the Cost of Creating a Common Payments Area, and Technology Cycles

The difference between the initial cost of creating a single payments area H and the lower cost of the alternative scenario L is a key determinant for both the social and the private optimality of a single payments area. So far it has been assumed that H substantially exceeds L , thus requiring sufficiently strong channels of welfare creation to outweigh this cost difference. However, there is an important time dimension to this cost difference which has not become apparent in the simple static model of spatial bank competition. In order to adopt technological improvements payment systems require major updates from time to time, involving high cost outlays even without the creation of a single payments area. Hence if a major system change is about to occur in a national system, the difference in costs between the adoption of systems for a single payments area and the technological overhaul of a national payment system will be substantially smaller and may even become zero. Therefore it is a key issue how quickly the transition is made from national systems to a single payments area. The tighter the time schedule of the project, the less likely it is that the switch to the new system occurs “naturally” within the technological innovation cycles of a certain payment system.

In the case of SEPA the realization of the project is occurring under high time pressure. The main standards and procedures have been defined only about one or two years before the official starting date of SEPA in 2008.²⁴ Due to delays in the legal process, the payment services directive is unlikely to be adopted by national parliaments before the start of

²⁴ See European Payments Council 2006a, 2006b, and 2006c.

SEPA. Therefore, the cost outlays for the creation of SEPA may involve a substantial additional cost going beyond the cost of regularly updating payment systems within the technological innovation cycle. A milder variant of SEPA could have been designed with a substantially longer implementation phase after the definition of SEPA standards and processes. The analysis of this paper suggests that the risk of pursuing an overly costly project and the resistance from the payment industry could have been substantially smaller.

A dynamic perspective on technological change in payment systems may reveal a substantial disadvantage of a larger payment area. Cross-country comparisons suggest that smaller payment systems with a more concentrated banking industry tend to adopt efficiency enhancing new technologies more quickly than larger systems.²⁵ Notably the US or France have been lagging far behind countries such as Norway or Finland in the replacement of costly check-based payments by more efficient payment instruments. SEPA may make the European payment system more similar to the US such that the speed of adopting efficiency improving technologies in the future may go down.

5. Conclusions

This paper analyzes SEPA from an economic research perspective, showing that the mostly informal policy debate can be structured within the simple framework of a spatial model of bank competition. Clearly, this is not the most general model possible that could be used for this purpose. Also the model cannot capture all relevant aspects in same depth. Effects going beyond the banking industry such as the impact of SEPA on back-office transaction services providers or on special benefits for bank customers could only be analyzed in less detail. From a policy perspective the paper focused on the economic effects of integrating national payment systems proper. Other important features of SEPA such as potentially substantial

²⁵ E.g., see Humphrey et al. (2000) and Milne (2006).

reductions of bank income because of losses of float due to a shortening of execution times as demanded by the payment services directive are not considered.

Still, the paper provides a systematic welfare analysis of a single payments area, identifying a possible case for public intervention to create such a system.²⁶ Key channels for enhancing welfare are discussed under a theoretical perspective. A first assessment of the actual importance of these channels is also undertaken, drawing upon the (limited) available empirical evidence.

As a conclusion, several potentially important channels for enhancing welfare in a single payments area such as cost reductions for cross-border transactions and higher efficiency due to more cross-border competition among banks seem to be fairly ineffective as the share of cross-border transactions is small and cross-border competition in retail banking is low. Some bank customers may enjoy special benefits from SEPA due to a streamlining of their payment management systems, but on average the impact seems to be limited. Smaller customers do not have complex payment systems to gain a lot from streamlining and larger customers have already highly efficient systems operating under more favorable terms negotiated with banks.

Positive welfare effects due to more efficiency and competition in back-office transaction services may be more relevant. However, the likely increase of competition in back-office services for payment cards affects only a small share of the value of payments in the economy. Gains from economies of scale due to the consolidation of European clearing houses are likely to exist. However, these effects appear to be of limited relevance for reducing the overall cost of the payment system in an economy. The experience of smaller European countries such as the Scandinavian countries suggests that promoting electronic payments is the key step for reducing the cost of the payment system to less than 0.5 percent

²⁶ In the analyses provided by the European Commission it remains unclear what exactly the economic case for public intervention is. The scope for cost savings through SEPA is stressed.

of GDP. In other countries such as the US the share may reach 3 percent of GDP.²⁷

Obviously, scale economies are not big enough to significantly reduce this share.

If the figures cited above are approximately correct, one can also derive an upper boundary on the cost savings due to a single payments area. If the implementation of low cost national measures reduces the cost of the payment system below 0.5 percent of GDP, the pure impact of a single payment area can only be to reduce this cost further towards zero. Even if the remaining cost can be halved, the cost reduction achieved by a single payment area would only be about 0.2 percent of GDP. Hence the additional cost reductions of a single payment area for an efficient payment system are quite small compared to the cost savings from the national initiatives promoting electronic payments. The actual impact of SEPA may be bigger because the SEPA project can speed up cost reduction efforts in some countries that otherwise might have taken a longer time to get implemented, thus moving the countries more quickly closer to the efficient frontier. For SEPA to be really effective in reducing the cost of the payment system a campaign for the promotion of electronic payments is essential. So far there has been little emphasis on this aspect in the SEPA process.

Putting aside the cost of creating a single payments area and possible concerns about the adoption of new technologies in a large payment system all the welfare channels discussed in this paper have a positive impact on welfare. It may only be the case that the positive effects are quite weak such that it is not certain that they can justify the cost of creating such a system. It was argued that by extending the implementation phase of SEPA the cost of the new system may be substantially reduced because SEPA could be better fit into the technological innovation cycles of national payment systems. Hence another policy conclusion of this paper is that the time frame for realizing SEPA should be extended to increase the chance of SEPA being indeed a welfare enhancing project.

²⁷ See Humphrey et al. (2000).

It would be highly desirable to fill the large existing research gaps pointed out in this paper. Currently the analytical foundation of SEPA is weak and substantial uncertainty exists about its effects. Especially the assessment of the various channels for enhancing welfare had to rely mostly on fairly preliminary evidence requiring more solid scientific analysis. Due to the large scale of the project it is surprising that such studies have not been conducted *before* SEPA got started. However, as Mundell (1961) already noted in his classical paper on optimum currency areas, economic considerations are just one factor often prevailed by others in the political decision process to undertake such a project. Inspired by Mundell subsequent research could lead to the development of a theory of optimum payments areas.²⁸ This paper suggests that from an economic perspective optimum payments areas do not necessarily coincide with currency areas. In most countries the bulk of transactions is domestic such that exchange rate considerations have little relevance. Still social welfare may be enhanced through various channels in a single payments area. Already now several countries neighboring the SEPA countries consider adapting their systems to SEPA standards. Their decisions could be better guided by such a theory.

²⁸ As forerunners of such a theory may be considered the papers of Berger et al. (1996) and Costa Storti and DeGrauwe (2002) which discuss the impact of lifting restrictions on interstate banking on the payment system and the implications of electronic money for the optimal size of monetary unions.

Appendix

Derivation of W^H in section 3:

$$\begin{aligned}
 W^H &= 2 \int_0^{x^{opt}} b - tx - \mathbf{f}_1^{opt} dx + 2 \int_{x^{opt}}^{0.5} b - t^* (0.5 - x) - s - \mathbf{f}_3^{opt} dx + 2(\mathbf{f}_1^{opt} - c)x^{opt} - 2H + \\
 &+ 2(\mathbf{f}_3^{opt} - c_3)(0.5 - x^{opt}) - S = \\
 &= 2[x^{opt}(b - \mathbf{f}_1^{opt}) - (x^{opt})^2 t / 2] + 2[(0.5 - x^{opt})(b - t^* / 2 - \mathbf{f}_3^{opt} - s) + (1/4 - (x^{opt})t^* / 2^2)] + \\
 &+ 2x^{opt}(\mathbf{f}_1^{opt} - c + \mathbf{f}_3^{opt} - c_3) + (\mathbf{f}_3^{opt} - c_3) - 2H - S = \\
 &= x^{opt}[4\mathbf{f}_3^{opt} + t^* + 2s - 2c - 2c_3] - (x^{opt})^2(t + t^*) + b - s - c_3 - t^* / 4 - 2H - S.
 \end{aligned}$$

Derivation of W^L in section 3:

$$\begin{aligned}
 W^L &= 2 \int_0^{0.5} b - tx - c - t dx + 2(c - t - c)0.5 - 2L = \\
 &= 2[(b - c - t) / 2 - t / 8] + t - 2L = \\
 &= b - c + t / 4 - 2L
 \end{aligned}$$

Derivation of W^F in section 3:

$$\begin{aligned}
 W^F &= 2 \int_0^{0.25} b - tx - \mathbf{f}_1^{opt} dx + 2 \int_{0.25}^{0.5} b - t(0.5 - x) - \mathbf{f}_3^{opt} dx + 2[(\mathbf{f}_1^{opt} - c) / 4 - H] + 2[(\mathbf{f}_3^{opt} - c_3) / 4] = \\
 &= 2[(b - \mathbf{f}_1^{opt}) / 4 - t / 32] + 2[(b - t / 2 - \mathbf{f}_3^{opt}) / 4 + t / 8 - t / 32] + (\mathbf{f}_1^{opt} - c + \mathbf{f}_3^{opt} - c_3) - 2H = \\
 &= b - (c + c_3) / 2 - t / 8 - 2H.
 \end{aligned}$$

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