

# Land rights, local financial development and industrial activity: evidence from Flanders (19th – 20th century).

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Work in progress, please do not quote.

## **Abstract:**

From the middle of the 18<sup>th</sup> century onwards most countries in North-Western Europe experienced a gradual decline of the importance of the agricultural sector and the ascent of industrial and service sectors. Following the United Kingdom's industrial development after 1750, Belgium was at the helm of this transition in continental Europe. France, the Netherlands and Germany experienced similar processes, albeit during a later wave of the industrial revolution. Divergence in the adoption rate new mechanized modes of production not only occurred between nation-states, but also within. In Belgium, industrial activity was initially centered in the resource-rich Walloon area, while Flanders retained its rural and proto-industrial character throughout the first half of the 19th century -bar the textile centers Ghent and Alost-. From the second half of the nineteenth century onwards, the secondary and tertiary sectors became increasingly important in certain areas of Flanders. By 1910, local non-agricultural employment rates had diverged substantially across the Northern half of Belgium. In this paper we investigate the hypothesis that this economic divergence across Flemish localities between 1848 and 1910 is explained by a 'De Soto effect'; an uneven distribution of rural land prices and access to formal credit institutions. In our paper the 'De Soto effect' entails that uniform land rights provided borrowers with an attractive form of collateral that, subject to the presence of local financial development, *in casu* institutionalized lending facilities (banks), eased access to external finance and fostered non-agricultural economic investment and employment. Studying more than 1200 localities in Flanders we find that the differing availability of local collateral and the variation in local financial development jointly explain a substantial amount of the variation in non-agricultural employment accumulated between 1848 and 1910. Indeed, by 1910 non-rural economic activity was especially elevated in those localities where both early (1848) rural land prices were high and early (1880) local financial development was pronounced, which is in line with the De Soto hypothesis.

## **Keywords:**

De Soto, banks & credit, industrial development, land prices, Flanders, 19<sup>th</sup> - 20<sup>th</sup> centuries

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## 1. Introduction

The relative impact of geography, institutions and cultures on economic development is hotly debated in the economic literature. In this paper we study the combined effect of property rights and financial development on economic activity. We give special attention to the ‘De Soto effect’, which constitutes one of the mechanisms by which financial development; collateral and land rights may interact and reinforce each other’s effect on economic activity. We employ the early 19<sup>th</sup> century history of the Southern Low Countries to disentangle the effects of improved homogeneous property rights, uneven distribution of collateral (e.g. rural land prices) and the introduction of banking on local economic development. By the end of the 18<sup>th</sup> century, the northern most region of what was soon to be Belgium had little organized industrial activity (Mendels 1971). During the long 19<sup>th</sup> century however, the newly independent Belgium became one of the frontrunners of the continental European industrialization (Mokyr 1974, 1976 and 1977, Horlings et al 1997). At the onset of the First World War, Belgium was characterized by vibrant industrial economic activity that was not uniformly distributed across localities. Variation in economic activities (number of firms per capita, employment by firms per capita) by 1910 is then explained by the introduction of homogenous property rights in the aftermath of the French revolution -diminishing information costs for creditors-, variation in the value of rural land and the introduction of modern banking.

Before the French Revolution, the Southern Low Countries were, like the remainder of continental Europe, dominated by three privileged classes, the clergy, the landed nobility and the urban bourgeoisie. Whereas the latter held a strong grip on the economic life within the city walls, the former groups had substantial interests in agriculture. With some regional variation, these three social groups were able to hold on to large swaths of rural and urban property (Van Bavel et al 2010). The specific institutional layout of the pre-modern society enabled the aristocracy and clergy furthermore to siphon of substantial amounts of capital (being it crops, cattle or cash) out of the productive sphere (North 1971, 1981, Brenner 1981). During the aftermath of the invasion by the French revolutionary armies, much of the entry barriers and prerogatives that provided sources of rent for the privileged groups as well as the patchwork of idiosyncratic property rights over land and houses were replaced by a system of modern homogenous property rights (Garaud 1959, Yernault 2011). By the time Napoleon’s armies left the Southern Low Countries after being defeated in the battle of Waterloo, the region was bequeathed with an entirely new institutional framework. Recently, Acemoglu et al. demonstrated the positive impact of a similar set of institutional reforms on long-term economic growth in those parts of Germany with a Napoleonic government at the dawn of the nineteenth century (Acemoglu et al 2011).

The higher security of uniform property rights could have assured investors of their property rights and may have stimulated the demand for investment in several ways. But the specific de Soto-

effect, namely that better property rights increase a firms' access to credit because the underlying property can now be put up as collateral at a reasonable transaction cost, can only start to play a role once modern banking is introduced. Several papers studying the De Soto effect have found positive effects of property rights along several dimensions, but often no increased access to credit, usually because the studied subjects (poor farmers, urban squatters) operate in an environment without modern banks, making credit an expensive and unofficial business anyhow. Pyle et al, who study the effect of land rights on access to credit of Russian industrial firms, do find a positive effect.

In the wake of the Industrial Revolution on the continent, Belgium saw a fast and early development of a relative modern banking system between 1820 and 1848. Whilst these first banks developed a branch network throughout Belgium, they were predominantly geared towards the large-scale and capital-intensive industrial enterprises in the ore- and coal-rich Walloon area of Belgium. As such, rents revenues, savings and profits were siphoned from Flanders and providing the capital needed to fuel the development of the metallurgical industry in the Meuse basin. By the middle of the nineteenth century, financial institutions with a local and/or rural focus were virtually nonexistent in Flanders. The economic crisis during the middle of the eighteenth century had furthermore caused a widespread socio-economic malaise as well as a full-fledged bank run, on both the Société Générale and the Banque de Belgique. In response, several liberal politicians considered the development and institutionalization of a nation-wide public savings initiative the key to combatting widespread poverty. After some initial stalling tactics from opposing factions (conservative Catholics whom preferred private initiative) the A.S.L.K.(Algemene Spaar- en Lijfrentekas ) /C.G.E.R.( Caisse Générale d'Épargne et de Retraite) was founded in 1867. During the 1880's and 1890's, as the success of the A.S.L.K. became apparent, several prominent members of the Catholic pillar furthermore encouraged the establishment of 'Raiffeisenkassen' as local communal banks, geared specifically towards rural communities, following German and Dutch example. Hence, by the start of the twentieth century the northern part of Belgium, comprising Flanders and Brussels, provide us with the proper environment for testing the De Soto hypothesis. If De Soto is right, it are not so much higher initial land values or the introduction of banks that sparkle economic development, but rather the interaction of both. Indeed, the corollary of De Soto's theory is that, in the presence of land rights, localities that both enjoy higher land prices and a higher bank presence will in the long run, through improved access to credit, also enjoy higher economic activity.

We find that neither localities with higher land prices in 1846, the first really reliable estimate after the Napoleonic establishment of more homogenous property rights and the foundation of Belgium, nor localities with higher bank presence in 1910 (first proper measurement) enjoy higher economic activity in 1937. But localities that enjoyed both higher land prices in 1846 and enjoyed a higher bank presence by 1910 do exhibit higher economic activity. This finding is in line with the De Soto hypothesis that, given uniform and enforceable property rights, higher land values, will through higher access to credit, lead to higher economic activity. Localities with higher average house prices in 1865 (first measurement) on the

other hand enjoy higher economic activity in 1937 irrespective of the degree of bank activity in the locality, indicating that the smoother and more homogenous property rights introduced by the French revolution also stimulated investment demand at large.

The remainder of this paper is organized as follows. In the next section we assess the development of industrial and entrepreneurial activity in Flanders during Belgium's first century as a nation state (from 1830 to 1937). The third section focuses on the development of land rights before and after the French revolution in the Southern Low Countries as well as the price variation in agricultural land. The fourth section turns to the development of modern banking in Belgium. The data are overviewed in section five. In sections 6 and 7 we discuss our evidence. Conclusions are presented in section 8.

## **2. The economic development of Flanders (1750-1910).**

During the long nineteenth century, the economy in the Low Countries underwent significant changes. Up until 1850, a combination of agricultural and proto-industrial activity was the means by which the bulk of the population in Flanders secured their livelihood (Dejongh et al 2001, Vanhaute 2007). During the subsequent decades, this specific type of agriculture, 'Flemish husbandry' gradually broke down. (Vanhaute et. al. 2012, p.185.). In this respect, the Southern Low Countries were by no means exception within North-western Europe. Between the late eighteenth to early twentieth century, all countries experienced a gradual declining importance of the agricultural sector, to the benefit of the industrial and manufacturing sectors of the economy (Vanhaute et. al. 2012, p.186 Mendels 1972, 241-261, Craeybecxk, 1963, pp. 390-341). In the process, the Malthusian trap that had governed economic and social life in the past, give way to seemingly sustained economic growth (Clark 2008). There were however, stark differences across nations in the speed and depth at which this process unfolded (for a recent overview see Broadberry et al 2010 p. 169-172). Divergence in the industrialization process did not only occur between nation states. Within the same nation, some regions evolved relatively swiftly into a mixed economy and enjoyed well-developed primary, secondary and tertiary sectors, while in other regions agriculture remained the main economic activity.

In the first half of the nineteenth century Belgium played a pioneering role in the takeoff of the industrialization on the European continent. Up until the Second World War, it was the 6<sup>th</sup> largest producer of coal, steel and a variety of chemicals, only trailing behind much larger nations as the UK, Germany, France and the USSR (Buyst et al. 2010). While being commonly known as the first industrializing country after Great Britain, this stage of the industrial transition showed stark regional and local differences. While the first large-scale mechanization occurred in the Walloon area around the start of the nineteenth century (Pasleau 2001, pp. 369-371, Gaier 1973), large-scale industrial production in

Flanders remained limited to old textile centers like Ghent and Alost (van Der Wee 1985, p.14-18). Whilst the South of Belgium experienced economic growth through a rapid industrialization, overall (proto-) industrial activity declined in the Flemish countryside due to a combination of bad harvests and a steadily declining interest in proto-industrial flax and linen industry as a consequence of stiff competition from industrial textile centers in Belgium (Ghent and Alost) and abroad (Gubin 1983, Jacquemijns 1928, Sabbe 1975, Dejongh et al 2001). Around the middle of the nineteenth century, employment in the agricultural sector reached an all-time and started declining shortly after. Given the higher rural population growth during the nineteenth century in combination with the partible inheritance system and low levels of migration, farm sizes became increasingly smaller as rents rose to exceptional levels. At the level of the farm this created need for new revenue streams –at first in proto-industrial activities but increasingly as a part-time artisan or tradesman- were developed. The increasing rent revenues themselves sought a productive allocation as well and consequently substantial amounts of rent-revenues were reinvested in the countryside through credit. As Vanhaute noted, these areas (inland East- and West-Flanders, South Brabant) saw an accelerated commercialization of rural life and an upsurge in second-tier and third-tier towns. Artisans, tradesmen and small businesses gradually developed in the countryside fueled by the aforementioned rising flows of money. As such a gradual deruralisation took place in the Flemish countryside during the long nineteenth century. Whilst overall population pressure remained high, increasingly smaller portion of them earned their wage through agricultural activity. During the same period, substantial interregional differences in industrial manufacturing employment developed. As table 1 shows, around the middle of the nineteenth century, overall industrial activity was evenly distributed throughout Flanders. In each province, approximately 7% to 11 % of the total workforce was employed in industrial sectors.

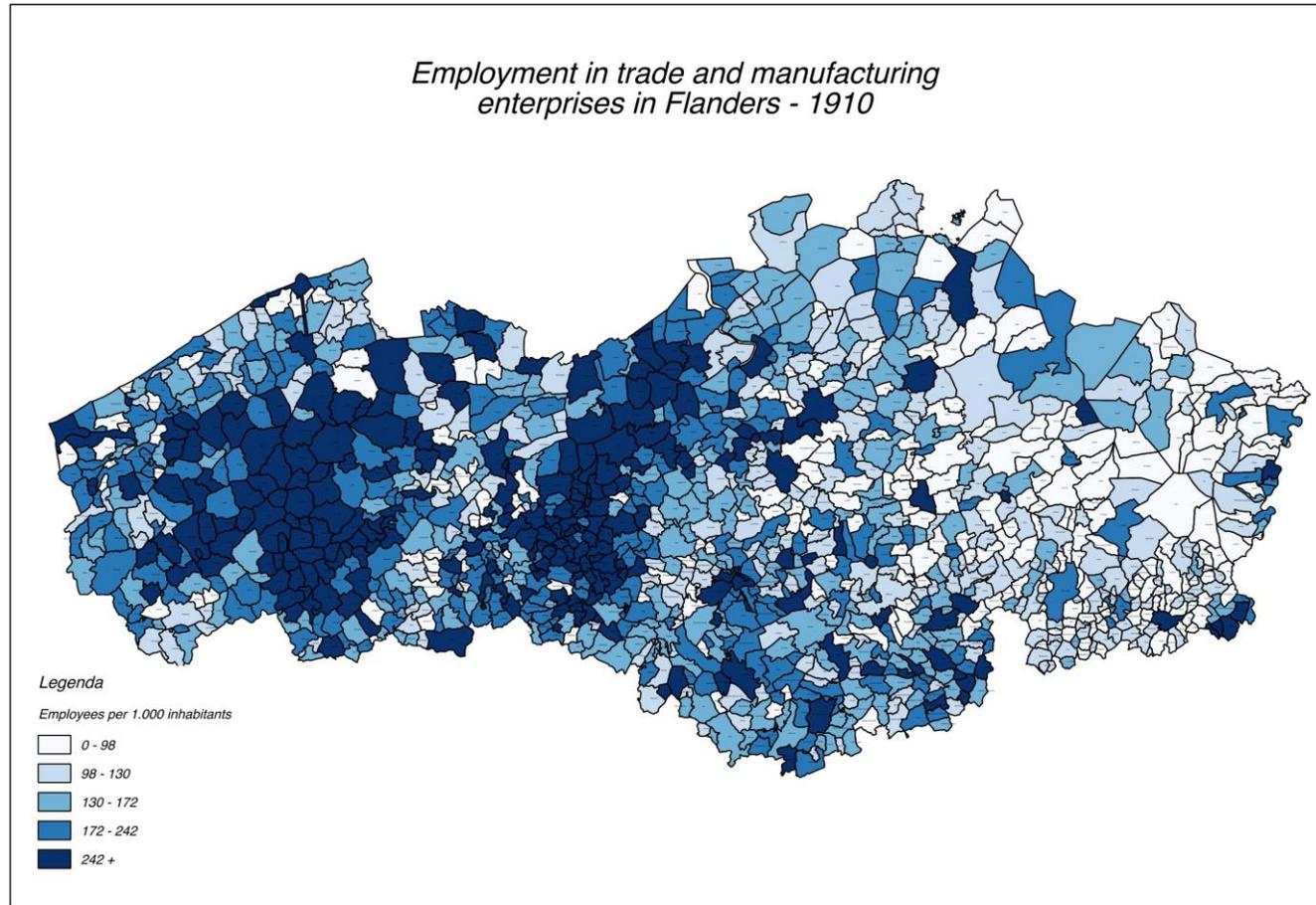
**Table 1: Industrial employment as percentage of total workforce**

	Antwerp	Brabant	West-Flanders	East-Flanders	Limburg
1846	9,04%	7,70%	11,11%	8,95%	7,01%
1896	10,39%	12,85%	8,04%	12,73%	6,64%
1910	12,20%	13,98%	11,12%	15,43%	7,67%

By the first half of the twentieth century however, certain regions had managed to catch up (Brabant, and to a lesser extent Antwerp and East & West Flanders. In Limburg and West Flanders on the other hand, industrial activity (expressed as the ratio of employees in industrial firms over the total workforce) managed to stagnate between 1846 and 1910. A more granular analysis of the number of industrial enterprises per locality (map 1) yields a more differentiated picture. Around the start of the twentieth century, industrial and manufacturing activity in Flanders is clustered around two centers, respectively in the south of West-Flanders and within the triangle formed by the cities of Ghent, Antwerp and Brussels.



Figure 1: Employees in trade and manufacturing per 1,000 inhabitants – 1910

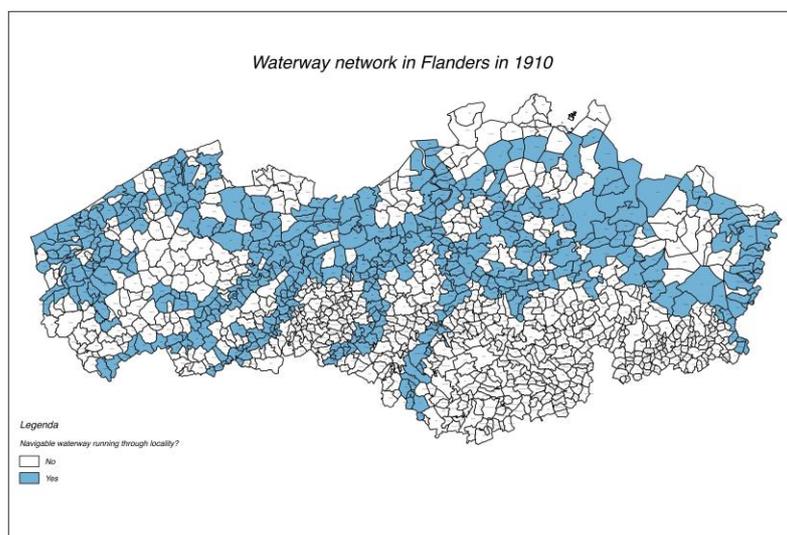
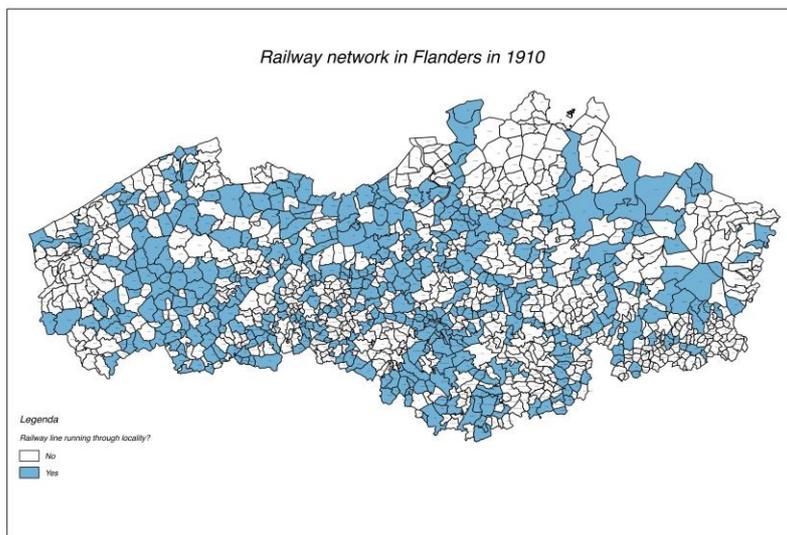
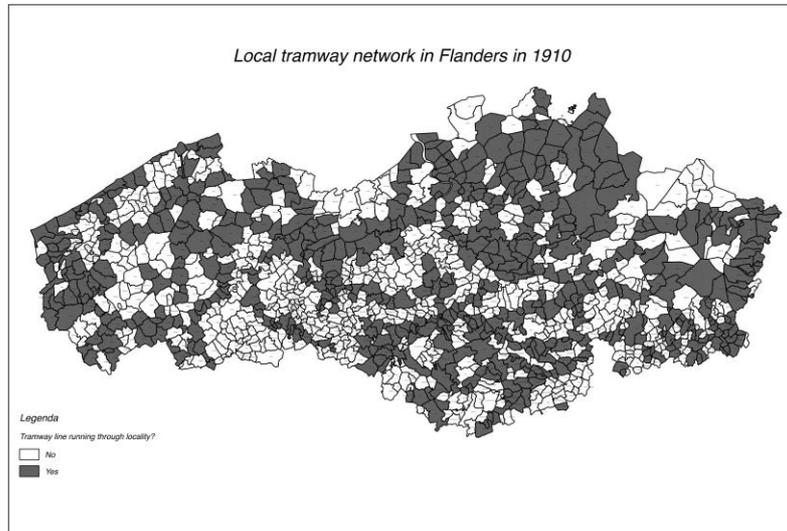




Parallel with the mutation of the industrial activity, Belgium's transportation network grew substantially. By the end of the long nineteenth century, the use of railroads to transport employees, raw materials and finished products alike had become a vital characteristic of the era. Just five years after its independence, Belgium was the second country on the continent, after France, to offer regular rail service (Grafe et al. 2010). By 1840, most major cities in both Flanders and the Walloon region were connected by railroad (Pounds 1990). As a result of private initiative combined with substantial state investments, Belgium had by far the densest railroad network in Europe by 1870 (0.095 km per square km), compared to the UK (0.081) and France (0.080) (Bogart et al. 2010). Initially, the motivation behind this enormous capital investment was to ensure the military effectiveness of the army and maintain independence from the Netherlands (Bogart et al. 2010). Soon however, it proved to play an important role in redistributing of industrial labor from the north to the south of Belgium. Besides railroads, a substantial amount of goods were transported over water. Unlike the Netherlands, which by 1700 already had a substantial network (exceeding 650 km) of navigable waterways financed and owned by local entities, the Southern Netherlands were somewhat lagging behind on their northern neighbors by 1800 (De Vries 1978). This was caused by the fact that the development of a substantial waterway network was not a government-led undertaking during the Austrian regime (unlike provincial roads), but depended on private and local initiative (van der Hertem 2000). In later stages, especially during period the United Kingdom of the Netherlands (1815-1830), substantial investments were being made, both by the state (substantial expansion of the port of Antwerp), provincial governments and private individuals (canals and waterways). By 1850, Belgium had the highest density of navigable waterways in Europe (0.05 km per square km) closely trailed by England and the Netherlands (0.029 and 0.04 respectively) and followed at a distance by France and Germany (0.006 and 0.005) (Bogart et al. 2010). Initially, most waterways were either in private ownership or owned by the provincial government, resulting in substantial toll-barriers and local particularisms, similar to the French situation around 1850. After the economic downturn during the middle of the nineteenth century, the state sought to address this issue en bought up the privately owned canals. Together with the canals owned by the provinces, these were put under the auspices of the central administration (Bogart et al. 2010).

As a whole, Belgium's transportation network expanded significantly from 1750 onwards. Before the independence of 1830, investments focused predominantly on provincial roads and waterways (Dejongh et al 2001). From 1850 onwards investments were rerouted to finance the development of a vast local tramway and railway network. In time, the success and importance of this multifaceted transportation network created a symbiosis with the industrial sectors. As the development of a well functioning transportation network fostered industrial development, the enduring industrialization itself constantly pushed for new and more efficient means of transportation (van der Hertem 1995, Dejongh et al 2001).

Figure 2a-c: Transportation network in Flanders - 1910



The transformational nature of the long nineteenth century with respect to the impact of the industrial revolution on social, judicial and economic structures and institutions is uncontested amongst historians. However, there is much less agreement on why the industrial revolution was so quick to sprout in Belgium. Several models have been employed to explain the variation in the adoption rates of industrialization in Northwestern Europe and Belgium. Nef (1943) for example, emphasized the unique and (in his view) revolutionary technological breakthroughs that resulted in an increased labor output and a new industrial mode of production. Recently Acemoglu et al. focused on the discriminating effects of Napoleonic on long-term economic development during the long nineteenth century (Acemoglu et al. 2011). Another strand of literature cites the persistence of regional proto-industrial activities and their transformation to an industrial scale. In his studies on protoindustrialization in Flanders, Mendels (1972, 1975) for example, stresses that the phase of proto-industrialization constituted a ‘preparatory stage’ for the large-scale industrialization of the nineteenth century. He considered two elements to be of importance. First, the accumulation of capital by merchants and entrepreneurs and second, the breaking up of the family-land bond (by making rural inhabitants almost exclusively dependent on their paid-labor incomes). As a result of these insights, several scholars have acknowledged the regional differences in labor-supply (for example the presence of landless laborers or ‘cottars’) and the type of agricultural production as driving forces behind an industrial takeoff (Craeybeckx 1963, Goldin et al. 1982, Sokoloff 1997.). During the past decades, the path-dependency between protoindustrialization and industrial economic development as suggested by Mendels has gotten renewed interest. Guy Dejongh et al. for example, recently suggested a distinct relationship between population growth and higher arable productivity and a development path of the industrialization process (Dejongh et al. 2001). Most recently Eric Vanhaute pointed towards the possibility of increased capital investments as a possible explanation for the increasing commercialization and industrialization of Flanders (Vanhaute 2007). In this paper we further explore the positive relationship between credit and economic development. By focusing on the value of potential collateral, in relation to enforceable legislation and formal credit institutions, we investigate to what extent access to finance drove economic development in the secondary and tertiary sector.

### **3. Land rights and land prices in Flanders.**

As laid out before, the presence of well-defined property rights constitute the key to our argument. In essence, land rights regulate the allocation of the remunerations that arise from the use of a specific piece of land (Deniger, 2003). Hence, property and property rights are a social construct; a consensus within society on how certain types of assets should be used, held and transferred (De Soto, 2000). In a study by the World Bank, Klaus Deiniger (2003) pinpoints several elements associated with prevalence of stable and secure property rights, ranging from the exclusive assignments of land rights and a distinct demarcation of the parcels to the presence of institutions to resolve legal disputes concerning

conflicts and the evolution of land rights in response to changing relative scarcities. The later element is in essence a reformulation of an observation made by Ester Boserup in her seminal work on agricultural growth (Boserup 1965, p76-77). Herein, she hinted at the stylized fact that whenever land was abundant, the need for (in)formal institutions to enforce ownership rights remained limited. However, as soon as population growth made fertile land less readily available, property rights were needed to subdue social and political conflict.

Historical evidence shows that large parts of Western Europe possessed secure property rights from the Middle Ages onwards. In England for example, land markets for freehold land truly came into existence after legal reforms in the 1170s and 1180s during the reign of Henry II (Palmer, 1985, Campbell, 2009). Two elements brought along by the legal reforms were especially significant. First, an increased alienability by tenants enabled the emergence of land markets. Second, as a consequence of the reforms, land could be used as a security for loans. This resulted in an increased liquidity of land as an economic resource. Hence the development of common law in the final quarter of the twelfth century fueled an unparalleled inflation of nearly 300 percent over the course of the next forty years (Palmer, 1985, pp.375-396; Fischer, 1996, Harvey, 1976, p. 57-84). A similar overnight transformation of the legal system did not take place in Continental Europe. Here, the evolution towards secure property rights was fragmented, mirroring the scattered political and institutional contexts. In broad terms, common law became established in France and Low Countries somewhere during the thirteenth and fourteenth century. Key elements in this evolution were the gradual disappearance of the feudal system, the amelioration of the social and judicial position of the peasantry after the Black Death and the gradual urbanization (Van Den Berg, 1988, p. 17-19; Howell, 2010, p. 42-59; Huppert, 1986, p. 68-72; Verhulst, 1958, p. 241-259). By the end of the Middle Ages however, property rights were institutionalized within larger legal frameworks throughout North-Western Europe. Both land and credit could be transferred through respectively land and credit markets (Van Bavel and Hoyle, 2010). Sale deeds were frequently officialized by either notaries, aldermen benches or the manorial court. In densely populated areas, such as certain sub-regions of the Southern Low Countries, official surveyors even set out to trace the exact boundaries of each plot. This depended however on the initiatives of local lords. Hence, a universal system of land title registration was absent at regional, let alone the national, level. Furthermore, property rights themselves were incomplete. First of all, since different rights over land coexisted, property rights were never exclusive. It could very well be that several people could claim to own rights established on the same piece of land. The monarch could give a domain in fief to his vassal, who could then exploit part of it as copyhold. The copyholder managed the land as if it were his exclusive property. Without the lord's consent, he could sell, mortgage or lease out the plot as he pleased. Since there was no central registration office land could be remortgaged several times, increasing the possibility of over-indebtedness and defaults. To sum up, the limited regulatory framework, absent registration offices and the entanglement of, albeit mutually exclusive, rights increased information costs dramatically. This severely dented the proper working of the land and credit market during the Ancien Régime. Consequently, land market participants were

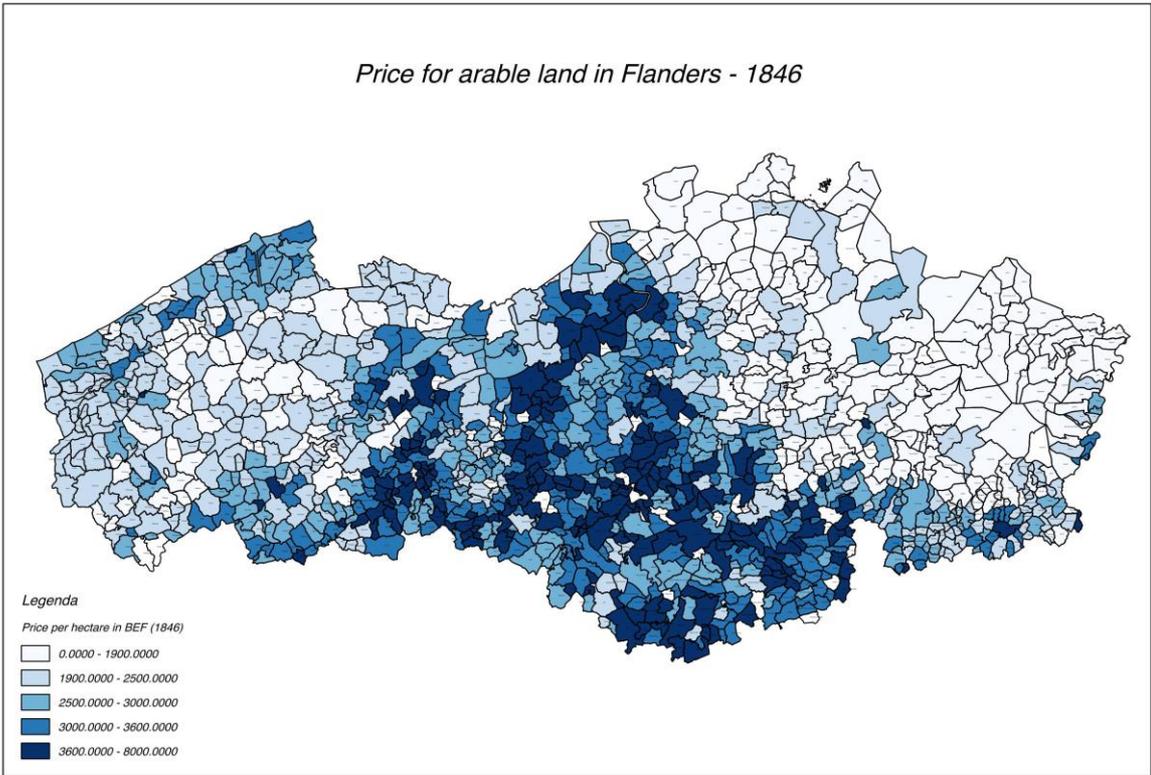
overwhelmingly locals or their relatives, since only they had sufficient knowledge to estimate the net worth of a piece of land (Nicholas, 1971, 272-279; Ogilvie S., 2001, p. 439-440). As a consequence, local procurators were often hired to assist extra-local investors, driving information costs up even further (Lis et al. 1980). Similarly throughout North-west Europe, credit in rural areas remained mostly limited to informal networks of relatives, neighbors or the local nobility (Lambrecht 2009, Limberger 2009, Brennan 2006, Schofield et al, 2009, Briggs 2009, Hoffman et al 2004, Rosenthal 1994).

The formal annexation of the Southern Low Countries to France in 1795 induced a profound reconfiguration of the legislative framework (Arblaster 2006, Garaud 1958, De Reu 2011, p. 57-71). Soon after the invasion of the French, the former prerogatives of the nobility and the church were abolished, as were the 'old' structures through which land was transferred. The wide variety of often overlapping rights that could be exercised on a single lot prior to the French Revolution was replaced with a straightforward division between freehold and usufruct. Furthermore an official Land Registry Office was established as early as 1796, which after some initial organizational problems, was operational from November 1802. This administration not only registered the ownership mutation of each plot, but were responsible for the surveying and valuation of all plots within the Belgian borders as well, a task that was only concluded in 1834 (Hannes, 1967, De Reu 2011, p.207). Parallel to the foundation the cadaster a mortgage registry was founded in 1796, to which every mortgage transaction had to be reported. The mortgage register made it furthermore possible for creditors to appeal to the sale of a property. Finally, recent research on the rural land market in Flanders during the final decades of the eighteenth century and the dawn of the nineteenth century have shown that transaction costs around the 1780's were approximately 110 percent higher than during the first quarter of the nineteenth century (De Reu et al 2014). By the time Napoleon's armies were defeated in the battle of Waterloo, an age-old system of institutions, social conventions and mores had been uprooted and replaced by a new framework. As a result, land was transferred and mortgaged much easier than before, at a lower transaction costs. Consequently, the first condition of the Hernando De Soto's model, homogenous and free property rights, was in place.

With regards to rural land prices, significant price differences can be observed at the interregional level (figure 2). While the value of land reflects the intrinsic quality of the land, these not only refer to the agricultural uses of the land (Peterson 1986, Menard et al 2005, Heffer 2010 and De Vijlder 2012). An in-depth analysis of the regional differentiation of the value of arable land in the modern period has yet to be done. However, based on research for earlier periods, some broad characteristics of differing average arable land values van nevertheless be identified (De Vijlder 2012). Several elements could explain these substantial intraregional differences; intrinsic soil quality, the ratio between buyers and sellers, access to navigable waterways or the (nearby) presence of urban market to sell of surplus production. Within the scope of this article however, our main interest is the variation in average arable land prices itself rather than explaining the diverging values. As can be seen in figure 3, average land prices in West-Flanders were rather elevated along a thin stretch of coastline, (the polder region) but were amongst the lowest in the

center of the province. As a whole, land values were substantially higher in East-Flanders, Brabant and Antwerp. Especially within the triangle formed by the major cities Antwerp, Ghent and Brussels average values of arable land were substantially higher. In the vicinity of urbanized areas, values gradually diminished as the distance between town and parish grew. Note however that intrinsic soil fertility continued to play a major role. Around Antwerp for example, prices gradually diminished along concentric circles around the city. To the west and the east this development was gradual. To the east (and to a lesser extent the north), values plummeted as soon as the dry and sandy Campine area began.

**Figure 3: Average value of arable land per locality - 1846**



#### 4. Credit and banking development in the Southern Low Countries

During the middle ages, the high level of urbanization in combination with the early development of factor markets created an environment within the Southern Low Countries wherein the use of money; credit and bills of exchange became a widespread phenomenon. In most of the Southern Low Countries informal rural credit markets arose from the late thirteenth century (Thoen et al 2009, Van Bavel et al 2010). Using annuities, defined as periodical and redeemable payments in money of a fixed sum mortgaged on immovable property, credit could be secured by both smallholders and yeoman alike (Lambrecht 2009). As Erik Thoen et al and Michael Limberger showed, rural credit became increasingly widespread in Flanders and Brabant during the sixteenth century as interest rates developed a downward trend (Thoen et al 2003, Limberger 2009, Van Bavel et al 2010)., In Flanders, interest rates on perpetual annuities declined from 8 per cent during the middle of the fifteenth century and 6.3 per cent during the middle of the sixteenth century to between 4.5 and 5 per cent during the eighteenth century. Furthermore, as real rural land prices rose during the early modern period in response to gradually expanding population, credit became a fundamental characteristic of rural practice during the early modern period, either to buy land, redeem older debts or purchase sowing seeds (Thoen et al. 2003, Lambrecht 2009). From 1611 onwards, these contracts were to be officialized by the local aldermen's bench by law (Martyn 2000). Given the both the complex system of property rights as well as the lack of local supply of capital to satisfy demand, an important role was set-aside for intermediaries (either through kin-networks or semi-specialized professionals e.g. villages clerks and notaries) to serve as proctors between borrowers and lenders (Lambrecht 2009, De Reu et al 2014). Hence, through informal credit mechanisms such as annuities, despite sometimes credit was extended across substantial geographical distances, borrowers and lenders remained connected on a personal level whether or not through intermediaries (Dewulf 2004). The French annexation of the Netherlands and the subsequent formalization of a new institutional framework and the introduction of a new paper currency (*assignats*), heavily disrupted local credit markets. Several eyewitness accounts suggest the severe implosion of (informal) credit market during the final decade of the eighteenth and first decades of the nineteenth century (Lambrecht 2009). Informal credit extension somewhat recovered during the subsequent decades, although the supply-side faced competition from alternative investments offered though newly founded banks ((government) bonds, equities etc...), certainly within the urban sphere.

As early as 1822, the first modern bank, the *Société Générale pour favoriser l'industrie national des Pay-Bas* -designed after the by then nearly 140 years old Bank of England-, was founded by William I of Orange (Neal, 1994). Until that moment, the banking sector in the Southern Low Countries remained an eclectic group with a largely regional focus. Throughout the country local banking families and merchants providing banking services were present, although higher density was noticeable in Brussels, Ghent, Antwerp, Liege and Mons (Veraghtert, 1978, p.337). The new bank's main objective was to promote the

national industry of the newly formed United Kingdom of the Netherlands. Its mandate covered a whole range of transactions, from discounting drafts and securities, issuing banknotes and financing the state to providing short-term credit to industrial projects (Houtman, 1994, p.50). However, it was only after the Belgian Revolution of 1830 that the project took off. During the economic boom of the early 1830's, the bank managed to gain a substantial foothold in the heavy industry in the South of Belgium (Witte and Parmentier, 1986, p.60). This was not only achieved by extending credit, but also by participating in the firms' capital – through swapping their long-term credit into shares-. Consequently, the *Société Générale* not only served as a bank but as a holding company as well. These ventures were partly financed through the *Société Générale's* savings bank. Due to its immediate success amongst the bourgeoisie and lower middle class, (savings expanded from 1 million BEF in 1831 to 40 million six years later) the *Société Générale's* position as undisputed financier of the industrial complex was assured (Veraghtert, 1978, p.339).

The rapidly growing role of the SG during the early stages of the industrialization of the young Belgian state had not gone unnoticed by the central government. Desperately trying to reign in the importance of the *Société Générale*, the government founded a similar institution in 1835 La Banque de Belgique. Its existence as a mixed bank however, was only short-lived. The bank could not overcome the country's first banking crisis of 1838 and had to sell of its participations in order to stay afloat. Henceforth, la Banque de Belgique would refrain from any capital participations and only continue its commercial banking activity (Houtman De Smedt, 1994, p.50). The financial unrest not only affected La Banque de Belgique. Several savings banks, mostly initiatives by local governments to tackle the advancing proletarianization, fell victim to crisis. Since they had invested substantial amounts of capital in now virtually worthless loans to industrial enterprises, those institutions could no longer meet the withdrawals of their customers' deposits. In the end, a full-blown bank run was only avoided when the *Société Générale* stepped in and incorporated the local savings banks in its existing savings branch. Unlike its smaller counterparts, the SG had managed to withstand the banking crisis of 1838. This was due to its stronger liquidity position and the liquidity support from the French Rothschild bank that transferred silver coins on a daily basis from Paris to Brussels (Veraghtert, 1978, p.349-350).

Both 1837-1838 and 1848-1849 can be considered recessionary periods for the whole of the European continent (Craig and Garcia-Iglesias, 2010 p. 143). While the *Société Générale* had managed to stabilize the situation by taking over several cash-strapped savings banks, it was not able to assume a similar role during the latter period. Due to the continent-wide economic downturn, which turned out to be especially harsh for the export-oriented industry in the south of Belgium, debtors pleaded for deferral of payments on their loans (Kurgan-Van Hentenrijk, 1977, p. 44-45.) At the same time, depositors sought to withdraw their deposits. Without additional liquidity, the financial system would grind to a halt. By late march 1848, in a desperate attempt to get the situation under control, the government stepped in. Since a bank run was lurking around the corner, they established a fixed exchange rate for banknotes issued by both the *Société Générale* and *La Banque de Belgique*. In conjunction, they tried to control the money supply

by imposing a maximum amount of 30 million BEF notes to be issued by both banks (10 million by *La Banque de Belgique* and the remaining 20 million by the *Société Générale*).

The events that took place during the spring of 1848 had a profound impact on Belgium's financial system during the subsequent decades. The crisis of 1848 had shown that a thorough reform of the banking sector was long overdue. Hence, the government relieved the *Société Générale* and *La Banque de Belgique* of their right to issue banknotes and transferred this task to the newly created National Bank of Belgium. In the same legislation, it was stipulated that the government would establish their own savings bank as an alternative to private banking institutions such as *La Banque de Belgique* and the *Société Générale*. Whilst savings banks had existed from as early as 1836 (Tournai), they had a limited reach as they focused their activities in urban and industrial centers. The large majority of them were situated in the industrial centres in the South of Belgium and were private initiatives, such as 'La Banque de Huy', 'La Banque Liégeoise' or the 'Veille Montagne', founded by Walloon industrialist Charles de Brouckère in 1842. By 1864 approximately 13 savings institutions existed in Belgium, representing approximately 40,000 savings accounts (about 0,9 accounts per 100 inhabitants) and 25 million francs in savings (*Algemene spaar- en lijfrentekas van België*, 1965). However, it would take another sixteen years before the new public savings bank would finally be established. Whilst the crisis of 1848 made the necessity of a publically –controlled savings-initiative clear, the auspicious economic revival of the 1850's combined with an upswing of economic liberalism and anti-state interventionism especially from Catholic circles, delayed the establishment of a public savings bank significantly (Witte and Parmentier 1986). Only 16 years after the initial proposal and after significant opposition from the parliament, the *Algemene Spaar en Lijfrentekas* was founded in 1865 (Witte and Parmentier, 1986, p. 60).

At first, the scope of the bank was limited to the main office in Brussels, which initially expanded quickly due to the fact that existing local savings banks as well as several *Société Générale* subsidiaries (in Nivelles, Dinant, Tongres and Philipville to name a few) that carried over their funds to the main branch of the A.S.L.K. During these first few years the main source of spatial growth of the A.S.L.K was the emergence of local subsidiaries that sprung up in quick succession. Founded exclusively on local initiative, four years after the start of the A.S.L.K., already 21 local branches had been founded. By 1869, the total balance of the A.S.L.K. amounted to 16,8 million BEF of which 943,000 BEF originated from the local divisions. An additional element for the early success of the A.S.L.K was the cooperation between the bank and other public institutions. From the outset, deposits could be made not only through the A.S.L.K itself, but also through one of the 35 agencies of the National Bank of Belgium and the local offices the Registry Office, extending the geographical reach of the bank by the end of the 1860's to most first and second tier towns within the kingdom. However, the penetration of the rural countryside was distinctively lacking. From 1870 on, deposits to a savings account could be made through the local post offices, similar to the recently established Post Office Savings Bank in England. This implies that any of the 427 postal offices active in Belgium around 1870 could serve as a local office of the A.S.L.K. (Van der Herten 1996).

The undisputed success of collaboration between the postal offices and the savings bank can be seen in table 2. Note that the bank did not become a part of the post-office department, but remained an independent branch of the Government, controlled by the ministry of Finance (Aerts 1970, National Monetary Commission 1910).

**Table 2: Savings accounts through post offices 1870-1910**

	Postoffices	Saving accounts through post offices	Deposits
1870	427	4.416	891.114 BEF
1880	765	54.464	30.176.984 BEF
1890	819	511.595	192.290.475 BEF
1900	1.085	1.390.047	503.665.348 BEF
1910	1.496	2.290.114	770.939.732 BEF

From then on the *A.S.L.K* was an undisputed success. Between 1870 and 1890, the number of depositors and their deposits grew respectively fourteen and sixteen fold (De Belder, 1986). While by the end of the nineteenth century about 55 percent of the Belgian population lived in cities and towns with over 5.000 inhabitants (Segers, 2003, p. 327), the banks extensive local branch network implied that the ASLK was by no means a strictly urban affair. The network through which deposits could be made was impressive. By 1880, the ASLK was active in more than 505 Belgian towns and villages, resulting in a nationwide coverage of approximately nearly one in eight of all communities. The total deposits of the bank exceeded 128 million Belgian francs of which 30 million was deposited through the postal office. During the initial phase of the development of the bank from its inception in 1865 up to about 1885, these funds were mainly invested in bills of exchange (both domestic and foreign, to the amount of 50 to 60 percent of the capital) and government bonds (20 to 30 percent). The remaining 10 percent of the bank's investments were loans with financial securities as collateral (Algemene spaar- en lijfrentekas van België, 1965).

Table 3 shows that there was a substantial heterogeneity in the initial spatial coverage of the bank. In the industrialized south of Belgium, especially in the province of Liege and Hainaut, ASLK offices – whether full-fledged subsidiaries or post offices- were active in respectively 23 and 40 percent of all communities. However, as is the case in Hainaut, the high levels of territorial coverage did not necessarily imply a high adoption rate amongst the population. These rates (e.g. the ratio between the number of accounts in each province and the population of said province) varied widely, with 6,1 percent in Brabant being the absolute outlier (column 2 of table 3). In general however adoption rates fluctuated between 1.16 and 2.95 percent. Especially between the first five provinces that will make out the research population of our final analysis, clear-cut differences existed between the ‘central’ provinces of Brabant, Antwerp and East-Flanders and the peripheral provinces of Limburg and West-Flanders. The average account size on the other hand, was subject to relatively little variation, except for East- and West-

Flanders. In the former deposits were 50 percent smaller than the countrywide-average, whereas in the latter accounts were twice as large as in most other provinces (e.g. there were fewer but more affluent clients). While these elements hint towards structural regional differences in the late nineteenth century banking sector, and therefore merit further research, the scope of this article does allow us to pursue these observations.

**Table 3: A.S.L.K. branches, 1880.**

Province	Branch coverage (% of localities)	Branch coverage (% of population)	Nr. of accounts	Avg. savings per branch	Avg. Nr. of accounts per branch	Average account
West-Flanders	16%	1,16%	9357	278.329 BEF	223	1.249 BEF
East-Flanders	16%	2,62%	26944	198.372 BEF	550	361 BEF
Brabant	15%	6,21%	78473	806.857 BEF	1226	658 BEF
Antwerp	19%	2,26%	18487	551.929 BEF	616	896 BEF
Limburg	10%	1,70%	4102	148.530 BEF	205	724 BEF
Hainaut	40%	1,86%	21299	94.724 BEF	159	596 BEF
Namur	13%	2,15%	7461	108.711 BEF	143	758 BEF
Liege	23%	2,95%	24359	165.240 BEF	321	516 BEF
Luxemburg	13%	2,51%	5507	116.898 BEF	145	807 BEF

Ten years later, by 1890, the ASLK had grown exponentially with a network of 844 (affiliate) offices, through which 731.057 clients (13% of the total population) placed deposits. These depositors represented over 325 million BEF of bank savings. During the final decennium of the nineteenth century however, a governmental inquiry had laid bare that the established system of savings banks was unable to cater to the need of the rural peasantry. While a substantial part of the bank's clients indeed lived in the countryside, only few of them were farmers (De Belder, 1986, p. 102). Well-of artisans, merchants and civil servants made out the bulk of the rural clientele (Van Mole, 1986, p. 129). Furthermore, while both the *A.S.L.K* and the savings branch of the SG managed to attract savings from the countryside, most of these amassed savings were lent to large industrial corporations, often in the Walloon region. The complaint that the existing system drained too much capital from the agricultural into the industrial sector was not unheard of (Delfosse, 1983, p. 55-74). At the same time, savings banks became increasingly vertically segregated within the three established political denominations. Hence, it is not surprising that especially the Catholic party saw an enormous opportunity in the countryside. Through the dual structure, of on the one hand the ASLK and on the other hand the recently founded *Boerenbond* a local network of *Raiffeisenkassen* was founded to work in collaboration with the A.S.L.K. These institutions sought to collect savings from local farmers. These were, either through the local *Raiffeisenkas* or the lending activity of the ASLK, reinvested on the local level through loans and/or mortgages. With over 700 *Raiffeisenkassen* spread throughout the Belgian countryside in 1910, roughly 1/4 of all parishes had a local cooperative, averaging

40 members per branch (Van Mole, 1986, p. 145). Although the venture was primarily focused on farmers and their families, in practice men and women of all sorts of backgrounds committed their lifesavings to their local *Raiffeisenkas*. Between 1895 and 1910 non-farmers amounted to 15% of the depositors and even less of the deposits, since they saved on average less than farmers. At the same time the non-farmers also received over 30 percent of the loans extended by the *Raiffeisenkas*, borrowing on average between 50 and 100 percent more than the farmers (Van Mole, 1986, p. 153-154). Besides the new *Raiffeisen* initiative, the investment focus of the A.S.L.K. itself had undergone a significant shift as well. Approximately one-fourth of the bank's funds were invested in government securities, similar to the previous period. The importance of bills of exchange however, had declined dramatically in favor of long-term corporate bonds. Substantial sums were furthermore made available to the private and agricultural sector through loans and mortgages (Algemene spaar- en lijfrentekas van België, 1965).

**Table 4: the ASLK portfolio in 1913**

Investment of the A.S.L.K. in 1913	Amount (in million BEF)	Share of total
Government bonds	355	25,85%
Corporate bonds	351	25,56%
Provincial and municipal bonds	243	17,69%
Bills of exchange (foreign)	165	12,01%
Loans for social housing initiatives	96	6,99%
Bills of exchange (domestic)	73	5,32%
Loans	42	3,06%
Mortgages	33	2,40%
Loans to agricultural sector	15	1,09%
Miscellaneous	0,4	0,03%

Between the founding of *Société Générale* and 1910, when (savings) banks were first incorporated in the industrial census, the financial landscape was altered profoundly, as illustrated in table 5 below. The monopolistic position of the *Société Générale's* savings-branch, which remained untarnished until the crisis of 1848, had received stiff competition by 1910. The market was clearly dominated by the government-led A.S.L.K. with over 2,8 million depositors and outstanding capital of 964 million BEF. At the start of WOI, the deposits of the ASLK even surpassed the banknotes in circulation (1.123 billion as opposed to 1,004 billion (Algemene spaar- en lijfrentekas van België, 1965). Similar financial institutions were no competition for the ASLK -at least not in terms of deposit balance-. The commercially *Société Générale*, trailed from a far, with several municipal savings banks (not unexpectedly situated in the industrial hubs of the era) and banks set up by industrial companies and *Raiffeisenkassen* following closely. By 1910, there were a total of 3,3 million saving accounts on a total population of 7,4 million. The aggregate deposits amounted to over a billion BEF of capital, the bulk of which was deposited at accounts of the A.S.L.K.

**Table 5: Savings banks in Belgium – 1910**

Institution	Number of accounts	Overall deposit balance (in million BEF)
A.S.L.K	2,808,549	964.668
A.S.L.K (Youth savings)	462,356	15.940
Raiffeisenkassen	27,334	10.001
Société Générale	21,123	38.237
Municipal savings bank Tournai	14,284	4.695
Banque Liégeoise	5,015	0.942
Savings banks of industrial companies	3,234	8.442
Municipal savings bank Nivelles	2,343	5.273
Municipal savings bank Aalst	809	0.677
Banque De Huy	189	0.248
Total	3.345,236	1.049,134

## 5. Empirical strategy and data:

### Identification of the de Soto effect

We want to verify whether the combination of higher land prices and the presence of local financial development is related in a causal way to the later emergence of non-agricultural economic activity in Flanders, controlling for basic characteristics like access to waterways or railways, the ownership concentration, the type and the usage of the land and the local house prices. Before the French revolution the proto- industry was small and equally developed across the Northern part of the Southern Lower Countries (currently Flanders), We explained before how the industrialisation started off in the Southern part of the Southern lower countries already in the 1830's, but the industrial development of the Northern part was largely absent till after the 1848 crisis. We can therefore use the level of non-agricultural economic activity in 1910 as a measure of the accumulated net growth of non-agricultural economic activity between 1848 and 1910. Employment is our preferred measure of economic activity because it is widely available early on though industrial censuses of the new Belgian state. We model economic activity per locality  $Y_i$  in 1910 as (1):

$$Y_{i,t} = \alpha_0 + \alpha_1 P_{i,t-2}^{land} + \alpha_2 Bank_{i,t-1} + \alpha_3 P_{i,t-2}^{land} * Bank_{i,t-1} + \alpha_4 Z_{i,t-2} + \varepsilon_i$$

Where  $P_{i,t-2}^{land}$  is the average land price of the locality in 1846 (just before our starting point in 1848) and  $Bank_{i,t-1}$  denotes early local financial development. We have two main measures of early financial development at the local level, namely the number of ASLK deposit accounts per capita of the locality in 1880 and the amount of savings per capita of the locality in 1880. These data are hand-collected from internal bank data found in the old publications and archives of the bank. ASLK credits at the local level are unfortunately not available.

$Z_{i,t-2}$  is a vector of local control variables, usually also measured in 1846 (or 1865 in one case), and  $\varepsilon_i$  is a disturbance term. The key relation is the interaction between local financial development and the land price in boosting industrialization. The large time gap between the dependent variable and the main independent variables (respectively more than 60 years and 30 years) is our approach to ruling out reverse causality from industrial development to land prices and financial development, an issue to which we will return in the results section. If De Soto is right, valuable land rights would have especially beneficial effects on economic activity through the improved access to credit and financial development has more beneficial effects on economic activity if collateral is present in the form of valuable land that can be pledged. This implies the hypothesis that  $\alpha_3 > 0$ .

### Dependent variables

We consider approximately 1210 localities in the northern part of nowadays Belgium (the provinces of West-Flanders, East-Flanders, Antwerp, Limburg and Brabant), following the administrative division of 1910. Specifically the measures of economic activity  $Y_i$  are 1)  $Y_{E1}$  the number of people employed by establishments in the secondary sector (industry) and tertiary sector (mainly trade) in 1910 per 1000 capita, 2)  $Y_{E2}$  the number of people employed by establishments in the tertiary sector (mainly trade) in 1910 per 1000 capita and 3)  $Y_{E3}$  the number of people employed by establishments in the secondary sector (industry) in 1910 per 1000 capita. This data is drawn from the HISTAT database that was manually compiled from official government statistics based on censuses.<sup>1</sup> Although general censuses of industry and trade exist from the late eighteenth century onwards, only few offer a detailed perspective on the occupational structure of all the localities. During the nineteenth century for example, several

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<sup>1</sup> See table 1 for an overview of the used variables, as well as their respective sources. For an overview of the literature concerning (historical) trade, agricultural and manufacturing censuses see: *De algemene tellingen van de bevolking, de handel, de nijverheid en de landbouw sedert 1846 in België gebonden*. In: Algemene volks-, nijverheids-en handelstelling op 31 december 1947. Deel I. Brussel, 1949, pp. 41-44; G. De Brabander. *De regionaal-sectoriële verdeling van de economische activiteit in België (1846-1979): een kritische studie van het bronnenmateriaal*. Leuven, 1984, pp. 145-156. (Interuniversitair Centrum voor Hedendaagse Geschiedenis . Bijdragen 97) N. Bracke, Bronnen voor de industriële geschiedenis: gids voor Oost-Vlaanderen (1750-1945). Gent, 2000, pp. 194-196; J. Buntinx, Nationaal Instituut voor de Statistiek: inventaris van het archief van de Economische en Sociale Telling van 1937 en vergelijkend onderzoek met de gepubliceerde resultaten. Brussel, 2003, 189 p. (Algemeen Rijksarchief. Inventarissen 345); P. Olyslager, De localisering der Belgische nijverheid. Antwerpen, 1947, 285 p. (Reeks van de School voor Economische Wetenschappen 32)

censuses were carried out, but all of them focused on either specific sectors, omitted rural regions or had a limited reliability.<sup>2</sup> The census of 1910 on the other hand, provides us with information on the industrial (both second and third sector – excluding governmental organizations-) activity and employment on the level of the locality.

The Central Bureau of Statistics, aided by the local authorities, led the practicalities of the undertaking. Each locality had to detach several clerks to perform the actual count. Each one of these clerks was responsible for an operating area populated by no more than fifteen hundred people. The original data provides information on the type of establishment and their employment, using an intricate classification system. In total, this list entailed some 1272 industrial and approximately 153 commercial branches. We aggregated this data at the municipal level, as to obtain an indicator for the degree of non-agricultural economic employment at the local level.

### **Main explanatory variables**

Our main locality level explanatory variables are the average price for arable land and the activity of lending institutions per capita. Unfortunately, no data on lending facilities is available pre-1910. Therefore we measure early local financial development by looking at local presence of branches of the ASLK in 1880. The ASLK was by a wide margin the largest (and government-owned) bank in Belgium in terms of clients and deposits before 1910. Local credit data are not available, but since obtaining a loan from the ASLK implied owning or opening a deposit account and since the internal flow of funds inside the ASLK was still very constrained by technical hurdles, the number of ASLK-accounts and the amount of ASLK savings per locality can be considered as robust proxies for local lending activity. As a robustness check we however also look into data from Raffeisenkassen. These are measured later (1910) and are much less complete than the ASLK data, but the advantage is they also include direct data on locally disbursed credits. The data for the 1846 land prices ( $P_{i,t-2}^{land}$ ) stem from two agricultural censuses and are expressed in Belgian francs per hectare.

### **Control variables**

Our base model is augmented with several control variables. In order to take into account demand-effects, we include local house prices ( $P_{i,t-2}^{house}$ ), which are calculated as the average cadastral value per home in the locality in 1865 (first registration). Similarly, since the spatial implantation of industrial activity depended in part on transportation facilities, we include in our model using three separate variables respectively for the presence of navigable waterways (both rivers and channels), railway stations and

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<sup>2</sup> Respectively the industrial censuses of 1880 & 1846 and the trade census of 1830.

neighbourhood railway stations. Finally, we controlled for the soil quality, the total acreage of the locality, the usage of the soil, and the concentration of land ownership, and the percentage of the locality that was communal property and hence could not serve as collateral for private investment. An exhaustive overview of all variables and their sources can be found in table 1 in the appendix.

## 6. Results

We lay out our estimates of (1) in tables 6, 7, 8 and 9, varying the scope of the dependent variable. We generally find that the land price of 1846 is positively related to later economic activity, suggestive of the theory that collateral may have played a role. There is evidence that local financial development may also be related to the subsequent growth of non-agricultural employment. This effect of local financial development however tends to disappear once we allow for the joint effect of land prices and financial development. Let us first focus on table 6, where the dependent variable is employment in industry and trade. In panel A we observe that the hypothesis that  $\alpha_3 > 0$  cannot be rejected at the 1% level when financial development is measured by ASLK presence or savings. The ASLK-based measure of local financial development indeed only affects economic growth in regions where land prices tended to be historically high, which provides strong evidence of a De Soto effect. In Panel B we however do not find an equivalent effect for the less complete and later data on Raffeisenkassen.

In spite of the large time gap between our dependent and our main independent variables (respectively 30 and more than 60 years), one possible avenue of reverse causality remains. It is still possible that localities with early high growth perspectives had an early higher demand for financial services and this drives our results. The finding however that the direct effect of early financial development is not longer significant after including the interaction with early land prices ( $\alpha_2 = 0$ ), indicates that there is no such reverse causality in our sample. Indeed, such reverse causality would require  $\alpha_2 > 0$  in every equation, which can clearly be rejected. In addition the demand for investment and hence possibly for financial services is controlled by including average local house prices in 1865.

We proceed by considering employment in industry and trade separately in table 7 and 8, allowing for the fact that the Raffeisenkassen may be more important for financing in some sectors than in others. Indeed in panel B of table 7, where the dependent variable is employment in trade in 1910, we cannot any longer reject  $\alpha_3 > 0$  even for the Raffeisenkassen. Especially when we consider local Raffeisenkassen credits as the measure of local financial development, there is a clear De Soto effect. Credits from Raffeisenkassen seem to be related to more employment in trade establishments especially in those localities where the land price was historically high. In table 8 we consider employment in industry in 190 as the dependent variable. Here the positive effects of local financial development are limited to the presence of the ASLK. The presence and credits of Raffeisenkassen are not in any way positively related

to employment, whether land prices are high or not. It seems that the Raffeisenkassen therefore mainly played a role in financing smaller trade establishments, but not so much in financing industry.

To gain additional confidence that our results are not driven by the sheer presence of financial development but rather by differences in the extent of local financial development, we exclude from our sample all localities where we have no ASLK deposit accounts (ASKL saving volumes) in 1865, reducing our sample from the 1205 (1201) original localities to only 186 (182) localities. The results are strikingly robust. Indeed the estimations in table 9 reveal that, once the interaction between land prices and financial development is taken into account, neither land prices nor financial development are significant any more. Indeed, in table 9 the interaction effects between land prices and bank development are consistently and significantly positive ( $\alpha_3 > 0$ ) and largely diminish or even drive out completely the direct impact of bank development and land prices on economic activity ( $\alpha_1 = 0, \alpha_2 = 0$ ). This implies we cannot reject the De Soto hypothesis: local financial development only leads to sustainable non-agricultural employment if land prices are high and vice versa.

Throughout table 3 to 6 we included house prices in 1865 as a control for local wealth and hence demand. House prices are in some specifications positively and significantly related to non-agricultural economic activity in 1910. There is weak evidence therefore of a multitude of channels by which property rights may positively influence economic activity. The direct and sometimes positive effect of house prices suggests that, next to the very robust De Soto effect of land rights on economic development demonstrated in this paper, property rights on houses may also resort some positive effect on employment through channels that are more demand-driven. This indicates that the smoother and more homogenous property rights introduced by the French revolution may also have stimulated investment demand at large. Deeper analysis of this possible demand channel falls beyond the scope of this paper and is deferred to further research.

Not surprisingly, early access to railways very robustly related to higher employment by firms 15 years later, again illustrating the importance of market access for economic development. Indeed, having a local railway station increases the number of non-agricultural workers with about 4 per 100 inhabitants. This a substantial number, since the average non-agricultural employment in total employment ranges from only from about 7% to more than 20% in 1910. This substantial effect of railways in early industrial development is perfectly in line with earlier literature in this field.

The percentage of communal land is always negative and sometimes substantially and significantly so. It seems indeed that communal land ownership did not contribute to boosting industrial development, but rather slowed it down significantly. This does not rule out that communal land may fulfilled other functions, for example maintaining social stability and guarding equity among the villagers during

industrialisation, but these roles fall far beyond the scope of this paper and are therefore deferred to further research.



**Table 6 Local per capita employment in industry and trade 1910**

Panel A: land prices and ASLK

	number of ASLK deposits per capita in 1880			ASLK savings per capita in 1880		
land price of locality in 1846 (in 000)	0.0127*** (0.003)	0.0115*** (0.003)	0.0115*** (0.003)	0.0128*** (0.003)	0.0120*** (0.003)	0.0120*** (0.003)
financial development	0.4636*** (0.107)	-0.2011 (0.258)	-0.1911 (0.262)	0.5595*** (0.153)	-0.3805 (0.368)	-0.3576 (0.373)
land price x financial development		0.3040*** (0.107)	0.2973*** (0.112)		0.4610*** (0.164)	0.4442*** (0.170)
house price			0.0468 (0.221)			0.0853 (0.220)
campine	-0.0666*** (0.012)	-0.0658*** (0.012)	-0.0655*** (0.012)	-0.0664*** (0.012)	-0.0657*** (0.012)	-0.0651*** (0.012)
loam	-0.0273*** (0.009)	-0.0280*** (0.009)	-0.0278*** (0.009)	-0.0269*** (0.009)	-0.0278*** (0.009)	-0.0274*** (0.009)
polder	-0.0114 (0.016)	-0.0120 (0.015)	-0.0118 (0.016)	-0.0122 (0.016)	-0.0142 (0.016)	-0.0138 (0.016)
sandy_loam	0.0079 (0.007)	0.0077 (0.007)	0.0079 (0.007)	0.0087 (0.007)	0.0085 (0.007)	0.0089 (0.007)
Waterway access 1896	0.0128* (0.007)	0.0122* (0.006)	0.0121* (0.007)	0.0126* (0.007)	0.0123* (0.007)	0.0121* (0.007)
Neighbourhood railway station 1910	0.0099* (0.005)	0.0092* (0.005)	0.0091* (0.005)	0.0102* (0.005)	0.0092* (0.005)	0.0089* (0.005)
Railway station 1896	0.0397*** (0.006)	0.0385*** (0.006)	0.0384*** (0.006)	0.0400*** (0.006)	0.0388*** (0.006)	0.0386*** (0.006)
fallow	0.1211 (0.148)	0.1360 (0.147)	0.1369 (0.148)	0.1395 (0.148)	0.1689 (0.148)	0.1698 (0.148)
hay	0.0086 (0.047)	0.0020 (0.047)	0.0014 (0.047)	0.0109 (0.047)	0.0028 (0.047)	0.0017 (0.047)
grassland	-0.1019***	-0.1057***	-0.1064***	-0.1024***	-0.1033***	-0.1049***

	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)
garden	0.8734***	0.7953***	0.7899***	0.8851***	0.8279***	0.8166***
	(0.129)	(0.131)	(0.134)	(0.129)	(0.130)	(0.134)
desolate_heath	-0.0085	0.0018	0.0019	-0.0052	0.0036	0.0038
	(0.035)	(0.035)	(0.035)	(0.036)	(0.036)	(0.036)
common	-0.0622	-0.0748*	-0.0746*	-0.0669	-0.0727*	-0.0726*
	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)
log(farming acreage)	0.0166***	0.0154***	0.0153***	0.0166***	0.0154***	0.0153***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
HHI46	0.1423*	0.1307*	0.1296*	0.1455*	0.1326*	0.1304*
	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)
Observations	1,205	1,205	1,205	1,201	1,201	1,201
R-squared	0.291	0.296	0.296	0.287	0.292	0.292
Adjusted R-squared	0.281	0.285	0.284	0.277	0.281	0.281

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Panel B: land prices and Raffleisenkassen

	Raffleisen members per capita in 1910			Raffleisen savings per capita in 1910			Raffleisen credit per capita in 1910		
land price of locality in 1846 (in 000)	0.0122*** (0.003)	0.0120*** (0.003)	0.0116*** (0.003)	0.0128*** (0.003)	0.0126*** (0.003)	0.0123*** (0.003)	0.0126*** (0.003)	0.0124*** (0.003)	0.0120*** (0.003)
financial development	-0.9535*** (0.237)	-1.1154* (0.586)	-1.1001* (0.586)	-0.8776** (0.444)	-1.2867 (1.162)	-1.2510 (1.161)	-2.1335** (1.008)	-3.3247 (2.356)	-3.2457 (2.354)
land price x financial development		0.0687 (0.227)	0.0678 (0.227)		0.1623 (0.426)	0.1600 (0.425)		0.5220 (0.933)	0.5150 (0.932)
house price			0.3474* (0.209)			0.3880* (0.211)			0.3745* (0.210)
campine	-0.0616*** (0.012)	-0.0614*** (0.012)	-0.0593*** (0.012)	-0.0620*** (0.012)	-0.0618*** (0.012)	-0.0593*** (0.012)	-0.0622*** (0.012)	-0.0618*** (0.012)	-0.0595*** (0.012)
loam	-0.0283*** (0.009)	-0.0282*** (0.009)	-0.0267*** (0.009)	-0.0267*** (0.009)	-0.0267*** (0.009)	-0.0248*** (0.010)	-0.0277*** (0.009)	-0.0276*** (0.009)	-0.0260*** (0.010)
polder	-0.0125 (0.016)	-0.0126 (0.016)	-0.0115 (0.016)	-0.0118 (0.016)	-0.0119 (0.016)	-0.0108 (0.016)	-0.0120 (0.016)	-0.0119 (0.016)	-0.0107 (0.016)
sandy_loam	0.0084 (0.007)	0.0085 (0.007)	0.0097 (0.007)	0.0084 (0.007)	0.0085 (0.007)	0.0099 (0.007)	0.0083 (0.007)	0.0085 (0.007)	0.0098 (0.007)
Waterway access 1896	0.0125* (0.007)	0.0126* (0.007)	0.0117* (0.007)	0.0133** (0.007)	0.0134** (0.007)	0.0123* (0.007)	0.0121* (0.007)	0.0121* (0.007)	0.0111* (0.007)
Neighbourhood railway station 1910	0.0134** (0.005)	0.0134** (0.005)	0.0121** (0.005)	0.0125** (0.005)	0.0126** (0.005)	0.0112** (0.005)	0.0132** (0.005)	0.0132** (0.005)	0.0119** (0.005)
Railway station 1896	0.0424*** (0.006)	0.0423*** (0.006)	0.0411*** (0.006)	0.0434*** (0.006)	0.0435*** (0.006)	0.0421*** (0.006)	0.0439*** (0.006)	0.0438*** (0.006)	0.0425*** (0.006)
fallow	0.1433 (0.148)	0.1433 (0.148)	0.1514 (0.148)	0.1550 (0.149)	0.1555 (0.149)	0.1651 (0.149)	0.1432 (0.149)	0.1441 (0.149)	0.1527 (0.149)
hay	0.0135 (0.047)	0.0138 (0.047)	0.0080 (0.047)	0.0150 (0.047)	0.0152 (0.047)	0.0088 (0.047)	0.0159 (0.047)	0.0171 (0.047)	0.0108 (0.047)
grassland	-0.1057*** (0.039)	-0.1057*** (0.039)	-0.1120*** (0.039)	-0.1029*** (0.039)	-0.1029*** (0.039)	-0.1097*** (0.039)	-0.1043*** (0.039)	-0.1044*** (0.039)	-0.1113*** (0.039)

garden	0.9101*** (0.129)	0.9127*** (0.129)	0.8560*** (0.133)	0.9194*** (0.129)	0.9215*** (0.129)	0.8581*** (0.134)	0.9134*** (0.129)	0.9169*** (0.130)	0.8555*** (0.134)
desolate_heath	-0.0010 (0.036)	-0.0007 (0.036)	0.0015 (0.036)	-0.0035 (0.036)	-0.0027 (0.036)	-0.0003 (0.036)	-0.0022 (0.036)	-0.0026 (0.036)	-0.0003 (0.036)
common	-0.0792* (0.044)	-0.0792* (0.044)	-0.0794* (0.044)	-0.0783* (0.043)	-0.0779* (0.043)	-0.0777* (0.043)	-0.0699 (0.043)	-0.0683 (0.043)	-0.0684 (0.043)
log(farming acreage)	0.0193*** (0.004)	0.0193*** (0.004)	0.0185*** (0.004)	0.0190*** (0.004)	0.0190*** (0.004)	0.0181*** (0.004)	0.0185*** (0.004)	0.0185*** (0.004)	0.0176*** (0.004)
HHI46	0.1561** (0.075)	0.1552** (0.075)	0.1439* (0.075)	0.1571** (0.075)	0.1567** (0.075)	0.1438* (0.076)	0.1540** (0.075)	0.1523** (0.075)	0.1402* (0.076)
Observations	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
R-squared	0.289	0.289	0.290	0.285	0.285	0.287	0.283	0.283	0.285
Adjusted R-squared	0.278	0.278	0.279	0.275	0.274	0.276	0.273	0.272	0.274

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 7 Local per capital employment in trade in 1910**

panel A: land prices and ASLK

	number of ASLK deposits per capita in 1880			ASLK savings per capita in 1880		
land price of locality in 1846 (in 000)	0.0025*** (0.001)	0.0022** (0.001)	0.0022** (0.001)	0.0024*** (0.001)	0.0023*** (0.001)	0.0022*** (0.001)
financial development	0.1615*** (0.030)	-0.0035 (0.072)	0.0087 (0.074)	0.1226*** (0.043)	-0.0673 (0.104)	-0.0431 (0.105)
land price x financial development		0.0755** (0.030)	0.0672** (0.031)		0.0932** (0.046)	0.0753 (0.048)
house price			0.0573 (0.062)			0.0902 (0.062)
campine	-0.0103*** (0.003)	-0.0101*** (0.003)	-0.0098*** (0.003)	-0.0095*** (0.003)	-0.0094*** (0.003)	-0.0088*** (0.003)
loam	-0.0031 (0.003)	-0.0033 (0.003)	-0.0030 (0.003)	-0.0031 (0.003)	-0.0033 (0.003)	-0.0029 (0.003)
polder	0.0175*** (0.004)	0.0173*** (0.004)	0.0175*** (0.004)	0.0170*** (0.004)	0.0166*** (0.004)	0.0170*** (0.004)
sandy_loam	-0.0002 (0.002)	-0.0002 (0.002)	0.0000 (0.002)	-0.0000 (0.002)	-0.0001 (0.002)	0.0003 (0.002)
Waterway access 1896	-0.0017 (0.002)	-0.0018 (0.002)	-0.0020 (0.002)	-0.0016 (0.002)	-0.0017 (0.002)	-0.0019 (0.002)
Neighbourhood railway station 1910	0.0039*** (0.002)	0.0038** (0.002)	0.0036** (0.002)	0.0043*** (0.002)	0.0041*** (0.002)	0.0038** (0.002)
Railway station 1896	0.0066*** (0.002)	0.0063*** (0.002)	0.0062*** (0.002)	0.0071*** (0.002)	0.0068*** (0.002)	0.0066*** (0.002)
fallow	-0.0530 (0.041)	-0.0493 (0.041)	-0.0482 (0.041)	-0.0463 (0.042)	-0.0404 (0.042)	-0.0394 (0.042)
hay	-0.0038 (0.013)	-0.0054 (0.013)	-0.0062 (0.013)	-0.0027 (0.013)	-0.0043 (0.013)	-0.0054 (0.013)
grassland	0.0025	0.0016	0.0006	0.0013	0.0011	-0.0005

	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
garden	0.1287***	0.1093***	0.1027***	0.1407***	0.1292***	0.1173***
	(0.036)	(0.037)	(0.038)	(0.036)	(0.037)	(0.038)
desolate_heath	-0.0116	-0.0090	-0.0088	-0.0153	-0.0135	-0.0133
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
common	-0.0012	-0.0043	-0.0041	-0.0001	-0.0012	-0.0011
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
log(farming acreage)	-0.0000	-0.0003	-0.0004	0.0003	0.0001	-0.0001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
HHI46	0.0043	0.0015	0.0000	0.0083	0.0057	0.0034
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Observations	1,205	1,205	1,205	1,201	1,201	1,201
R-squared	0.163	0.168	0.168	0.151	0.153	0.155
Adjusted R-squared	0.151	0.155	0.155	0.138	0.141	0.141

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Panel B: land prices and Raffleisenkassen

	Raffleisen members per capita in 1910			Raffleisen savings per capita in 1910			Raffleisen credit per capita in 1910		
land price of locality in 1846 (in 000)	0.0025*** (0.001)	0.0021** (0.001)	0.0019** (0.001)	0.0025*** (0.001)	0.0023*** (0.001)	0.0021** (0.001)	0.0025*** (0.001)	0.0021** (0.001)	0.0020** (0.001)
financial development	-0.0272 (0.067)	-0.3656** (0.166)	-0.3588** (0.165)	-0.0643 (0.126)	-0.4743 (0.328)	-0.4599 (0.327)	0.4140 (0.284)	-1.1988* (0.663)	-1.1659* (0.661)
land price x financial development		0.1436** (0.064)	0.1432** (0.064)		0.1626 (0.120)	0.1617 (0.120)		0.7067*** (0.262)	0.7038*** (0.262)
house price			0.1538*** (0.059)			0.1563*** (0.059)			0.1558*** (0.059)
campine	-0.0092*** (0.003)	-0.0088*** (0.003)	-0.0078** (0.003)	-0.0091*** (0.003)	-0.0089*** (0.003)	-0.0079** (0.003)	-0.0092*** (0.003)	-0.0086** (0.003)	-0.0076** (0.003)
loam	-0.0027 (0.003)	-0.0026 (0.003)	-0.0019 (0.003)	-0.0028 (0.003)	-0.0028 (0.003)	-0.0020 (0.003)	-0.0025 (0.003)	-0.0023 (0.003)	-0.0016 (0.003)
polder	0.0173*** (0.004)	0.0172*** (0.004)	0.0176*** (0.004)	0.0171*** (0.004)	0.0171*** (0.004)	0.0175*** (0.004)	0.0174*** (0.004)	0.0176*** (0.004)	0.0181*** (0.004)
sandy_loam	0.0001 (0.002)	0.0002 (0.002)	0.0008 (0.002)	-0.0000 (0.002)	0.0000 (0.002)	0.0006 (0.002)	0.0002 (0.002)	0.0003 (0.002)	0.0009 (0.002)
Waterway access 1896	-0.0014 (0.002)	-0.0013 (0.002)	-0.0017 (0.002)	-0.0014 (0.002)	-0.0014 (0.002)	-0.0018 (0.002)	-0.0012 (0.002)	-0.0012 (0.002)	-0.0016 (0.002)
Neighbourhood railway station 1910	0.0050*** (0.002)	0.0051*** (0.002)	0.0045*** (0.002)	0.0050*** (0.002)	0.0050*** (0.002)	0.0045*** (0.002)	0.0049*** (0.002)	0.0049*** (0.002)	0.0044*** (0.002)
Railway station 1896	0.0077*** (0.002)	0.0076*** (0.002)	0.0071*** (0.002)	0.0078*** (0.002)	0.0079*** (0.002)	0.0073*** (0.002)	0.0077*** (0.002)	0.0077*** (0.002)	0.0071*** (0.002)
fallow	-0.0495 (0.042)	-0.0495 (0.042)	-0.0459 (0.042)	-0.0471 (0.042)	-0.0467 (0.042)	-0.0428 (0.042)	-0.0520 (0.042)	-0.0508 (0.042)	-0.0472 (0.042)
hay	-0.0018 (0.013)	-0.0011 (0.013)	-0.0037 (0.013)	-0.0017 (0.013)	-0.0015 (0.013)	-0.0041 (0.013)	-0.0020 (0.013)	-0.0005 (0.013)	-0.0031 (0.013)
grassland	0.0026 (0.011)	0.0027 (0.011)	-0.0001 (0.011)	0.0026 (0.011)	0.0025 (0.011)	-0.0002 (0.011)	0.0030 (0.011)	0.0028 (0.011)	-0.0000 (0.011)

garden	0.1462*** (0.037)	0.1515*** (0.037)	0.1265*** (0.038)	0.1459*** (0.037)	0.1480*** (0.037)	0.1225*** (0.038)	0.1472*** (0.036)	0.1520*** (0.036)	0.1264*** (0.038)
desolate_heath	-0.0069 (0.010)	-0.0061 (0.010)	-0.0051 (0.010)	-0.0089 (0.010)	-0.0082 (0.010)	-0.0072 (0.010)	-0.0076 (0.010)	-0.0081 (0.010)	-0.0072 (0.010)
common	-0.0096 (0.013)	-0.0097 (0.013)	-0.0098 (0.013)	-0.0067 (0.012)	-0.0064 (0.012)	-0.0063 (0.012)	-0.0071 (0.012)	-0.0050 (0.012)	-0.0050 (0.012)
log(farming acreage)	0.0005 (0.001)	0.0005 (0.001)	0.0001 (0.001)	0.0006 (0.001)	0.0005 (0.001)	0.0002 (0.001)	0.0004 (0.001)	0.0003 (0.001)	-0.0000 (0.001)
HHI46	0.0086 (0.021)	0.0066 (0.021)	0.0016 (0.021)	0.0077 (0.021)	0.0073 (0.021)	0.0021 (0.021)	0.0077 (0.021)	0.0054 (0.021)	0.0003 (0.021)
Observations	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
R-squared	0.143	0.147	0.152	0.143	0.145	0.150	0.144	0.149	0.154
Adjusted R-squared	0.131	0.134	0.138	0.131	0.132	0.136	0.132	0.136	0.140

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 8 Local per capita employment in industry in 1910**

Panel A: land prices and ALSK

	number of ASLK deposits per capita in 1880			ASLK savings per capita in 1880		
land price of locality in 1846 (in 000)	0.0102*** (0.003)	0.0093*** (0.003)	0.0093*** (0.003)	0.0104*** (0.003)	0.0098*** (0.003)	0.0098*** (0.003)
financial development	0.3021*** (0.099)	-0.1976 (0.239)	-0.1998 (0.243)	0.4369*** (0.141)	-0.3132 (0.340)	-0.3145 (0.345)
land price x financial development		0.2285** (0.100)	0.2300** (0.104)		0.3679** (0.152)	0.3689** (0.157)
house price			-0.0105 (0.205)			-0.0049 (0.203)
campine	-0.0563*** (0.011)	-0.0557*** (0.011)	-0.0557*** (0.011)	-0.0568*** (0.011)	-0.0563*** (0.011)	-0.0563*** (0.011)
loam	-0.0242*** (0.009)	-0.0247*** (0.009)	-0.0248*** (0.009)	-0.0237*** (0.009)	-0.0245*** (0.009)	-0.0245*** (0.009)
polder	-0.0289** (0.014)	-0.0293** (0.014)	-0.0294** (0.014)	-0.0291** (0.014)	-0.0308** (0.014)	-0.0308** (0.014)
sandy_loam	0.0081 (0.007)	0.0079 (0.007)	0.0079 (0.007)	0.0087 (0.007)	0.0086 (0.007)	0.0086 (0.007)
Waterway access 1896	0.0145** (0.006)	0.0141** (0.006)	0.0141** (0.006)	0.0143** (0.006)	0.0140** (0.006)	0.0141** (0.006)
Neighbourhood railway station 1910	0.0060 (0.005)	0.0055 (0.005)	0.0055 (0.005)	0.0059 (0.005)	0.0051 (0.005)	0.0051 (0.005)
Railway station 1896	0.0331*** (0.005)	0.0322*** (0.005)	0.0322*** (0.005)	0.0329*** (0.005)	0.0319*** (0.005)	0.0319*** (0.005)
fallow	0.1741 (0.137)	0.1853 (0.137)	0.1851 (0.137)	0.1858 (0.137)	0.2093 (0.137)	0.2092 (0.137)
hay	0.0124 (0.043)	0.0074 (0.043)	0.0076 (0.044)	0.0136 (0.043)	0.0071 (0.043)	0.0072 (0.044)
grassland	-0.1045***	-0.1073***	-0.1071***	-0.1037***	-0.1044***	-0.1043***

	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
garden	0.7447***	0.6860***	0.6872***	0.7444***	0.6987***	0.6994***
	(0.119)	(0.122)	(0.124)	(0.119)	(0.121)	(0.124)
desolate_heath	0.0030	0.0108	0.0108	0.0101	0.0171	0.0171
	(0.033)	(0.033)	(0.033)	(0.034)	(0.034)	(0.034)
common	-0.0610	-0.0705*	-0.0705*	-0.0669*	-0.0715*	-0.0715*
	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)
log(farming acreage)	0.0166***	0.0157***	0.0157***	0.0163***	0.0153***	0.0153***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
HHI46	0.1379**	0.1293*	0.1295*	0.1372**	0.1269*	0.1270*
	(0.069)	(0.069)	(0.070)	(0.069)	(0.069)	(0.070)
Observations	1,205	1,205	1,205	1,201	1,201	1,201
R-squared	0.259	0.262	0.262	0.258	0.261	0.261
Adjusted R-squared	0.248	0.251	0.250	0.247	0.250	0.250

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Panel B: land prices and Raffleisenkassen

	Raffleisen members per capita in 1910			Raffleisen savings per capita in 1910			Raffleisen credit per capita in 1910		
land price of locality in 1846 (in 000)	0.0097*** (0.003)	0.0099*** (0.003)	0.0097*** (0.003)	0.0104*** (0.003)	0.0104*** (0.003)	0.0102*** (0.003)	0.0101*** (0.003)	0.0102*** (0.003)	0.0100*** (0.003)
financial development	-0.9263*** (0.218)	-0.7498 (0.540)	-0.7413 (0.540)	-0.8132** (0.410)	-0.8124 (1.071)	-0.7911 (1.071)	-2.5475*** (0.928)	-2.1259 (2.169)	-2.0797 (2.169)
land price x financial development		-0.0749 (0.210)	-0.0754 (0.210)		-0.0003 (0.393)	-0.0017 (0.393)		-0.1847 (0.859)	-0.1888 (0.859)
house price			0.1936 (0.193)			0.2316 (0.195)			0.2186 (0.194)
campine	-0.0524*** (0.011)	-0.0526*** (0.011)	-0.0515*** (0.011)	-0.0529*** (0.011)	-0.0529*** (0.011)	-0.0515*** (0.011)	-0.0530*** (0.011)	-0.0532*** (0.011)	-0.0518*** (0.011)
loam	-0.0256*** (0.009)	-0.0257*** (0.009)	-0.0248*** (0.009)	-0.0239*** (0.009)	-0.0239*** (0.009)	-0.0228*** (0.009)	-0.0253*** (0.009)	-0.0253*** (0.009)	-0.0243*** (0.009)
polder	-0.0298** (0.014)	-0.0297** (0.014)	-0.0291** (0.014)	-0.0289** (0.014)	-0.0289** (0.014)	-0.0283* (0.014)	-0.0294** (0.014)	-0.0295** (0.014)	-0.0288** (0.014)
sandy_loam	0.0083 (0.007)	0.0082 (0.007)	0.0089 (0.007)	0.0084 (0.007)	0.0084 (0.007)	0.0093 (0.007)	0.0082 (0.007)	0.0081 (0.007)	0.0089 (0.007)
Waterway access 1896	0.0139** (0.006)	0.0139** (0.006)	0.0134** (0.006)	0.0148** (0.006)	0.0148** (0.006)	0.0141** (0.006)	0.0133** (0.006)	0.0133** (0.006)	0.0127** (0.006)
Neighbourhood railway station 1910	0.0083* (0.005)	0.0083* (0.005)	0.0076 (0.005)	0.0075 (0.005)	0.0075 (0.005)	0.0067 (0.005)	0.0083* (0.005)	0.0083* (0.005)	0.0075 (0.005)
Railway station 1896	0.0347*** (0.005)	0.0347*** (0.005)	0.0340*** (0.005)	0.0356*** (0.005)	0.0356*** (0.005)	0.0348*** (0.005)	0.0362*** (0.005)	0.0362*** (0.005)	0.0354*** (0.005)
fallow	0.1928 (0.137)	0.1928 (0.137)	0.1973 (0.137)	0.2021 (0.137)	0.2021 (0.138)	0.2079 (0.138)	0.1952 (0.137)	0.1949 (0.137)	0.1999 (0.137)
hay	0.0153 (0.043)	0.0149 (0.043)	0.0117 (0.043)	0.0167 (0.044)	0.0167 (0.044)	0.0128 (0.044)	0.0180 (0.043)	0.0176 (0.044)	0.0139 (0.044)
grassland	-0.1083*** (0.036)	-0.1084*** (0.036)	-0.1119*** (0.036)	-0.1055*** (0.036)	-0.1055*** (0.036)	-0.1095*** (0.036)	-0.1073*** (0.036)	-0.1072*** (0.036)	-0.1112*** (0.036)

garden	0.7640*** (0.119)	0.7612*** (0.119)	0.7296*** (0.123)	0.7735*** (0.119)	0.7735*** (0.119)	0.7356*** (0.124)	0.7662*** (0.119)	0.7649*** (0.119)	0.7291*** (0.123)
desolate_heath	0.0058 (0.033)	0.0054 (0.033)	0.0067 (0.033)	0.0055 (0.033)	0.0055 (0.033)	0.0069 (0.033)	0.0054 (0.033)	0.0055 (0.033)	0.0069 (0.033)
common	-0.0696* (0.041)	-0.0695* (0.041)	-0.0696* (0.041)	-0.0715* (0.040)	-0.0715* (0.040)	-0.0714* (0.040)	-0.0627 (0.040)	-0.0633 (0.040)	-0.0634 (0.040)
log(farming acreage)	0.0188*** (0.004)	0.0188*** (0.004)	0.0184*** (0.004)	0.0185*** (0.004)	0.0185*** (0.004)	0.0179*** (0.004)	0.0182*** (0.004)	0.0182*** (0.004)	0.0176*** (0.004)
HHI46	0.1476** (0.069)	0.1486** (0.069)	0.1423** (0.070)	0.1494** (0.070)	0.1494** (0.070)	0.1417** (0.070)	0.1463** (0.069)	0.1469** (0.069)	0.1399** (0.070)
Observations	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
R-squared	0.264	0.264	0.264	0.258	0.258	0.259	0.259	0.259	0.260
Adjusted R-squared	0.253	0.253	0.253	0.248	0.247	0.247	0.248	0.248	0.248

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 9 Robustness check, specifications of table 6, panel A, excluding localities with no financial development**

Dependent variable: local per capita employment in industry and trade in 1910	number of ASLK deposits per capita in 1880			ASLK savings per capita in 1880		
land price of locality in 1846 (in 000)	0.0192** (0.008)	0.0121 (0.008)	0.0122 (0.008)	0.0198** (0.008)	0.0151* (0.008)	0.0152* (0.008)
financial development	0.2132 (0.156)	-0.5708 (0.367)	-0.5972 (0.375)	0.3288 (0.218)	-0.8461 (0.537)	-0.8897 (0.552)
land price x financial development		0.3377** (0.143)	0.3531** (0.150)		0.5324** (0.223)	0.5571** (0.234)
house price			-0.1247 (0.353)			-0.1278 (0.354)
campine	-0.0531 (0.033)	-0.0460 (0.033)	-0.0466 (0.033)	-0.0536 (0.035)	-0.0466 (0.034)	-0.0473 (0.035)
loam	0.0046 (0.030)	-0.0040 (0.030)	-0.0040 (0.030)	0.0060 (0.030)	-0.0048 (0.030)	-0.0047 (0.030)
polder	-0.0388 (0.038)	-0.0451 (0.038)	-0.0439 (0.038)	-0.0388 (0.039)	-0.0553 (0.039)	-0.0547 (0.039)
sandy_loam	0.0161 (0.018)	0.0148 (0.017)	0.0151 (0.018)	0.0187 (0.018)	0.0186 (0.018)	0.0190 (0.018)
Waterway access 1896	0.0071 (0.017)	0.0045 (0.017)	0.0049 (0.017)	0.0060 (0.017)	0.0041 (0.017)	0.0046 (0.017)
Neighbourhood railway station 1910	0.0241 (0.016)	0.0245 (0.016)	0.0261 (0.017)	0.0212 (0.017)	0.0187 (0.016)	0.0202 (0.017)
Railway station 1896	0.0706*** (0.020)	0.0689*** (0.020)	0.0695*** (0.020)	0.0681*** (0.020)	0.0637*** (0.020)	0.0641*** (0.020)
fallow	0.8205* (0.478)	0.9171* (0.474)	0.8945* (0.479)	0.9039* (0.489)	1.0957** (0.489)	1.0786** (0.493)
hay	0.0884 (0.139)	0.0564 (0.137)	0.0583 (0.138)	0.1010 (0.140)	0.0392 (0.141)	0.0398 (0.141)
grassland	-0.0921	-0.1153	-0.1123	-0.1049	-0.1170	-0.1133

	(0.125)	(0.124)	(0.125)	(0.133)	(0.131)	(0.132)
garden	0.2239	0.1655	0.1793	0.2278	0.1806	0.1956
	(0.189)	(0.188)	(0.193)	(0.191)	(0.190)	(0.195)
desolate_heath	-0.0223	0.0037	0.0024	-0.0256	-0.0051	-0.0065
	(0.092)	(0.092)	(0.092)	(0.106)	(0.105)	(0.106)
common	-0.1019	-0.0687	-0.0543	-0.1288	0.0184	0.0377
	(0.181)	(0.179)	(0.184)	(0.189)	(0.196)	(0.204)
log(farming acreage)	0.0126	0.0089	0.0090	0.0132	0.0096	0.0096
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
HHI46	0.4496**	0.4807**	0.4754**	0.4671**	0.4898**	0.4840**
	(0.215)	(0.213)	(0.214)	(0.219)	(0.216)	(0.217)
Observations	186	186	186	182	182	182
R-squared	0.322	0.344	0.344	0.322	0.345	0.346
Adjusted R-squared	0.253	0.273	0.269	0.252	0.273	0.269

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



## 7. Long run spatial dependence

It is obvious that over such long time spans the economic activity in one locality may be influenced by the economic activity in its neighbours, generating spatial dependence in the simple regressions. The Moran I test (available on request) indeed revealed spatial dependence for our main regressions. Therefore we proceed by estimating a spatially lagged equation where we allow the spatial dependence of economic activity of one locality on the activities of its neighbours:

$$Y_{i,t} = \alpha_0 + \rho WY_{i,t} + \alpha_1 P_{i,t-2}^{land} + \alpha_2 Bank_{i,t-1} + \alpha_3 P_{i,t-2}^{land} * Bank_{i,t-1} + \alpha_4 Z_{i,t-2} + \varepsilon_i(2)$$

with  $W$  the contiguity matrix of spatial weights based on the Euclidean distance calculated from the longitude and latitude of the locality's centre. Specifically, the longitude and latitude coordinates of either the main church or town hall of each locality were used. Distances longer than 20 km. are disregarded in the calculation of  $W$ . A positive  $\rho$  indicates that localities with neighbours that are economically active can be expected to be also more economically active and vice versa.

We lay out our results in table 10, where we repeat our main regressions of table 6, but now allowing for spatial dependence. Our first observation is that we cannot reject  $\rho > 0$ . The employment in trade and industry per capita indeed depends on that in the neighbours. Specifically, a locality will add about one job per capita, per two added jobs per capita in the spatially weighted neighbours. There is a multitude of possible channels to interpret this pattern of spatial dependence, like economic agglomeration effects, technology spillovers, trade spillovers, labour market spillovers, financial spillovers and many others. The analysis of these channels falls however far beyond the scope of this paper.

Our results from section 6 are very robust to controlling for spatial dependence. Early land prices still exert a positive influence on later development, but they mainly do so in combination with early local financial development. Indeed the direct effect of early financial development disappears altogether. This clearly indicates that financial development is only related to later growth in combination with the presence of early valuable collateral, which is clearly in line with our De Soto hypothesis. The results also reconfirm the absence of reverse causality running from early good economic perspectives to higher demand for financial services and subsequent economic development. Indeed, if this were the case the main effect of local financial development on later employment in trade and industry would always remain significant, which is clearly rejected by the results ( $\alpha_2 = 0$ ). Railway stations are still strongly positively related to growth and communal property is still not a positive contributor to the creation of non-agricultural employment.

Table 10: Main results of table 6, controlling for spatial dependence

	number of ASLK deposits per capita in 1880	ASLK savings per capita in 1880
land price of locality in 1846 (in 000)	0.01*** (0.003)	0.01*** (0.003)
financial development	-0.16 (0.293)	-0.30 (0.312)
land price x financial development	0.28** (0.124)	0.36** (0.150)
average cadastral value of houses	0.05 (0.218)	-0.02 (0.192)
campine	-0.06*** (0.010)	-0.06*** (0.009)
loam	-0.03*** (0.009)	-0.02*** (0.008)
polder	-0.01 (0.015)	-0.03** (0.013)
sandy_loam	0.01 (0.007)	0.01 (0.007)
Waterway access 1896	0.01* (0.007)	0.01** (0.006)
Neighbourhood railway station 1910	0.01* (0.005)	0.00 (0.005)
Railway station 1896	0.04*** (0.006)	0.03*** (0.006)
fallow	0.13 (0.171)	0.20 (0.159)
hay	0.00 (0.045)	0.01 (0.042)
grassland	-0.11*** (0.036)	-0.10*** (0.031)
garden	0.79*** (0.210)	0.70*** (0.189)
desolate_heath	0.00 (0.025)	0.02 (0.023)
common	-0.08*** (0.026)	-0.07*** (0.023)
log(farming acreage)	0.02*** (0.004)	0.02*** (0.004)
HHI46	0.13* (0.077)	0.13* (0.070)
$\rho$	0,510 * 0,265	0,652*** 0,233
P(Wald test $\rho = 0$ )	0,054	0,005
P (Langrange multiplier test $\rho = 0$ )	0,035	0,003
Squared correlations	0,296	0,266
Observations	1,201	1,201
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		

## 8. Conclusions

We analyze more than 1200 Flemish localities from 1846 till 1910. In 1846 the level of industrial development in these localities is very low and comparable, since Flanders still had to start its industrial development. By 1910 however there are very substantial differences and we can interpret the local variation in development in 1910 as a good measure of the growth between 1846 and 1910. Using a combination of earlier collected data by the HIS project and our own primary data collection from archives and cadasters, we document that there is substantially more industrial development in 1910 in those Flemish localities that were blessed both by higher land prices in 1846 and higher local financial development in 1880. The time gap between the dependent variable and the main independent variables already largely rules out reverse causality. However, it is still possible that localities with early high growth perspectives had an early higher demand for financial services. This demand effect is controlled for by including local house prices (measured in 1865) in the analysis. The finding that the direct effect of early financial development is not longer significant after including the interaction with early rural land prices, also indicates that there is no such reverse causality in our sample. We feel confident therefore in interpreting our finding as evidence of the De Soto hypothesis that, given uniform and enforceable property rights, higher land values, will through higher access to credit, lead to higher economic activity.

The results from Flemish history are also interesting for the many countries today that maintain some form of hybrid or communal land right that falls short of full property rights. Indeed, while such partial or shared land rights may play an important role in maintaining equity among otherwise disenfranchised farmers and guard stability and local tradition, they also have limited collateral value for banks because freely selling the land is barred. Our results suggest that in those circumstances local financial development and land rights may fall short of realizing their full economic development potential.

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## Data appendix:

**Table 9: Overview of outcome, explanatory and control variables**

Variable name	Variable	Operationalization
Employment ( $Y_{E1}$ )	Employment in trade and manufacturing enterprises per capita in 1910	Continuous variable divided by the locality's population in 1910
Employment ( $Y_{E2}$ )	Employment in trade enterprises per capita in 1910	Continuous variable divided by the locality's population in 1910
Employment ( $Y_{E3}$ )	Employment in manufacturing enterprises per capita in 1910	Continuous variable divided by the locality's population in 1910
Land Price	Average price for one hectare of freehold arable land in 1846	Original values divided by 1000, continuous variable per locality
Financial development measure 1	Number of ASLK accounts in the locality per capita in 1880	Continuous variable divided by the locality's population in 1880
Financial development measure 2	Amount of ASLK savings per capita of the locality in 1880	Continuous variable divided by the locality's population *1000 in 1880
Financial development measure 3	Number of Raffeisenkassen members in the locality per capita in 1910	Continuous variable divided by the locality's population in 1910
Financial development measure 4	Amount of Raffeisenkassen savings per capita of the locality in 1910	Continuous variable divided by the locality's population *1000 in 1910
Financial development measure 5	Amount of Raffeisenkassen credits per capita of the locality in 1910	Continuous variable divided by the locality's population *1000 in 1910
Land Price	Average market price for one hectare of freehold arable land in 1846	Original values divided by 1000, continuous variable per locality
House price	Average cadastral value of houses in the locality in 1865 (first data point)	Continuous variable, from individual cadastral values of houses in locality in 1865
campine	Localities in the campine regions, with typical poor soil quality	Dummy =1 if locality in campine region
loam	Localities that fall in fertile loam soil quality region	Dummy =1 if locality in loam region
polder	Localities that fall in the very fertile soil quality polder regions	Dummy =1 if locality in polder region
sandy_loam	Localities that fall in the moderately fertile sandy loam soil quality region	Dummy =1 if locality in sandy_loam region
Waterway access 1896	Locality access to a navigable waterway in 1896 (first data point)	Dummy =1 if locality has waterway access in 1896
Neighbourhood railway station 1910	Locality access to neighbourhood railway system through station in 1910 (first data point)	Dummy =1 if locality has neighbourhood railway station in 1910
Railway station 1896	Locality access to railway system through station in 1896 (first data point)	Dummy =1 if locality has neighbourhood railway station in 1896
Fallow	Acreage of fallow land in 1846 as share of farming acreage	Continuous share, per locality
Hay	Acreage of hay land in 1846 as share of farming acreage	Continuous share, per locality
Grassland	Acreage of grassland in 1846 as share of farming acreage	Continuous share, per locality

Garden	Acreage of gardens in 1846 as share of farming acreage	Continuous share, per locality
desolate_heath	Acreage of desolate and heath land in 1846 as share of farming acreage	Continuous share, per locality
common	Acreage of communal land in 1846 as share of total locality surface	Continuous share, per locality
Log (farming Acreage)	Log of the number of hectares used for farming in the locality in 1846	Continuous variable, per locality
HHI46	Herfindahl-Hirschman Index of land ownership concentration of the locality in 1846, from individual cadaster data	$HHI = s_1^2 + s_2^2 + s_3^2 + \dots + s_n^2$ (with $s_i$ = share of land plot $i$ in total acreage).
Xcoord	Longitude	Continuous variable, per locality
Ycoord	Latitude	Continuous variable, per locality

All data was provided by: Historical Database of Local Statistics – LOKSTAT, Ghent University, History Department supervised by Eric Vanhaute and Sven Vrielinck.