# European emigration in the late nineteenth century: the paradoxical case of Spain<sup>1</sup>

By BLANCA SÁNCHEZ-ALONSO

T he period 1870-1914 witnessed convergence in income per caput which was linked to the integration of the international economy, but Spain remained a peripheral country and progressed more slowly than other European societies towards higher standards of living. This article examines one major obstacle to the international integration of the Spanish economy, namely the emigration of labour, which remained low compared with that from other southern European countries such as Italy. Several historians have claimed that the imposition of tariffs prevented higher emigration during a period which was otherwise entirely favourable to migration since it was characterized by low transport costs, higher demands for unskilled labour in New World economies, and large wage differentials between Europe and the Americas. This article argues that the major obstacle to the emigration of Spanish labour was not so much the tariff on wheat as the depreciation of the Spanish currency at the end of the century. Contrary to the consensus in the subject literature, it seems that the wheat tariff exercised a positive impact on labour emigration, rather than a negative one. Within a Heckscher-Ohlin model, tariffs increased impediments to trade and stimulated the international mobility of the relatively abundant factor which in the Spanish economy was labour. More importantly, this article argues that emigration from Spain may have been income constrained, in which case higher real wages would have stimulated emigration. However, currency depreciation during the period under consideration actively discouraged emigration. The calculations presented here show that in the absence of depreciation, emigration from Spain could have been more than 40 per cent higher during the period 1892-1905. The difference is significant because of 'chains' that these potential emigrants might have developed, and it may account in great part for the differences in labour emigration between Spain and countries such as Italy. Such effects operated because emi-

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gration from Spain at the end of the nineteenth century was income constrained. Many potential emigrants could not afford the costs of leaving. Hence the importance of pioneer migrants in financing the move and start-up costs overseas.

The first section of the article offers a brief comparison with Italy, the largest supplier of emigrants in southern Europe, and discusses the effects of the late nineteenth-century agricultural depression on labour mobility. Sections II and III review the literature, both historical and theoretical, on the effects of tariffs and currency depreciation on labour mobility, and specify the article's central hypotheses. In section IV these hypotheses are tested econometrically. Conclusions are drawn in a short final section.

Ι

With the integration of the international economy from the 1870s onwards, movement of capital and labour between the Old World and the New increased. Competition from the New World's primary producers (especially in cereals) had a strong impact on European agriculture.<sup>2</sup> Unable to compete with the New World, European agriculture entered a period of depression and structural crisis in the late nineteenth century. One of the effects of this crisis was massive emigration. A comparison of emigration trends in Spain and in Italy during the period 1880-1914 yields interesting similarities and differences between these two classical cases of 'new emigration'. For example, there are two similar periods in the series: the late 1880s which exhibited a rising trend, and the years 1904-13, which witnessed a more sharply rising trend during which emigration from Spain and Italy peaked (figure 1).<sup>3</sup> But Spain diverges



Figure 1. Gross emigration from Spain and Italy, 1880-1914 Note: The vertical scale is logarithmic Sources: for Spain, Sánchez-Alonso, Causas de la emigración, app. A3; for Italy, Rosoli, Un secolo di emigrazione, app.

<sup>2</sup> Bairoch, *Commerce extérieur*, pp. 48-56, but qualified by O'Rourke, 'European grain invasion'. <sup>3</sup> Gross emigration data are used because the main interest is the trends and fluctuation of emigrant departures. from Italy in the 1890s and the early 1900s when the Spanish series falls while Italian emigration starts to boom.<sup>4</sup>

Spanish emigration rates remained low and stable between 1892 and 1905, while Italian emigration almost doubled in relation to the previous period (table 1). It has been argued that Spanish emigration levels were low during the 1890s partly because the Baring crisis had a strong negative impact on Argentina, the main country of destination, and also because Spain's colonial war against Cuba discouraged emigration. But Argentina was a common destination for Italians and Spaniards, and Italian emigration recovered much faster after the Baring crisis.<sup>5</sup> In 1895 the population of Buenos Aires included 80,000 Spaniards and more than 180,000 Italians. Furthermore, Spanish emigration to Cuba had been relatively low before the revolution and became significant only after independence and during the sugar boom of the first decade of the twentieth century.<sup>6</sup>

Table 1. Rates of gross emigration: Spain and Italy, 1882-1914 (per thousand population)

	1882-1891	1892-1905	1906-1914
Spain	3.4	3.9	9.5
Italy	3.8	6.6	11.2

Sources: For Spain, Sánchez-Alonso, Causas de la emigración, app. A.3. For Italy, Rosoli, Un secolo di emigrazione italiana, app.

In comparative and historical perspective the central problem is to explain the stagnation of Spanish emigration in the 1890s and its strong acceleration in the early twentieth century. After all, the 1880s and 1890s included years in which the agrarian depression was felt intensely across European agriculture and when competition from New World grain imports exercised a serious influence on emigration from Europe.<sup>7</sup> Unfortunately, there are very few studies which examine the effects of the depression on agricultural employment in any detail.<sup>8</sup> Historians have been more interested in the impact of falling agricultural prices on changes in land use and structural change at macroeconomic levels.<sup>9</sup>

Agricultural historians tend to agree that the fall in agricultural prices (especially those of cereals) affected rural employment adversely and the rise in emigration rates in several European countries during the 1880s seems to confirm this. Nevertheless, the direct impact of the agricultural depression on European emigration is more difficult to establish, because

<sup>8</sup> Exceptions for Spain are Robledo, 'Crisis agraria' and Sánchez-Albornoz, 'Castile, 1830-1930'.

<sup>&</sup>lt;sup>4</sup> Hatton and Williamson's explanation that what really made Spain different after the 1890s was the economic failure at home seems weak. Hatton and Williamson, 'Late comers', p. 66.

<sup>&</sup>lt;sup>5</sup> For the Baring crisis in Argentina, see Ford, Gold standard and Vázquez Presedo, Problemas de comercio.

<sup>&</sup>lt;sup>6</sup> Sánchez-Alonso, Causas de la emigración, chap. 4.

<sup>&</sup>lt;sup>7</sup> For the Italian case, Sori, L'emigrazione italiana; for Portugal, Pereira, Política y economía.

<sup>&</sup>lt;sup>9</sup> For the Spanish case, see Garrabou, 'Historiografia de la crisis', which also discusses Italy and Portugal. See also Sanz, 'Crisis triguera' and Garrabou, 'Crisis agraria española'. For Greece, see Petmezas, 'Diverse responses'.

little work has been done to establish whether the emigrants of the 1880s and 1890s belonged to the groups most directly affected by the depression (namely small landowners, tenant farmers, or smallholders).<sup>10</sup> In the Spanish case, Garrabou refers to 'the brutal impact of the crisis in rural society' and points out that, 'dispossessed of their lands and facing a weak demand for their labour, smallholders and tenant farmers had as their only alternative emigration'.<sup>11</sup> But Spanish emigration grew at an annual rate of 2.1 per cent during the period 1880-1900 and at an extraordinary rate of 11.7 per cent over the years 1900-13. For Italy the figures are 6.6 per cent and 4.7 per cent, respectively.<sup>12</sup> Why then was mass emigration from Spain a twentieth-century phenomenon and why were outflows relatively low during the agrarian depression of the late nineteenth century?

Π

Faced with a sharp fall in agricultural prices at the end of the nineteenth century, most European governments opted for protection and imposed tariffs on imported agricultural produce, particularly on wheat. The exceptions, Great Britain, the Netherlands, Denmark, and Switzerland, continued to import wheat at low prices and shifted their agricultural production into livestock farming and dairy production.<sup>13</sup>

Spain opted for protection and the effects of this policy on Spanish agriculture, especially on cereals, have been much debated among economic historians of Spain.<sup>14</sup> Following increases in tariffs (first in 1891, then in 1906, and finally in 1922), the price of Spanish wheat far exceeded world levels. In a period of falling international prices, the cultivated area and output of wheat increased in almost all Spain's agricultural regions.<sup>15</sup> Around 1910 cereals accounted for 33 per cent of final output from Spanish agriculture.<sup>16</sup> According to the literature, tariffs helped to maintain traditional agriculture, which was inefficient, kept Spanish wheat prices at artificially high levels, and retarded structural change within the agricultural sector. The consequences for the growth of the Spanish economy over the long run were considerable.<sup>17</sup>

<sup>11</sup> Garrabou 'Historiografia de la crisis', p. 535.

<sup>12</sup> Sánchez-Alonso, *Causas de la emigración*, pp. 140-2. In fact, the rate of gross emigration per thousand population in 1910-13 was 11 for Spain and 11.7 for Italy.

<sup>13</sup> O'Rourke, 'European grain invasion'.

<sup>14</sup> The coming to power of the Conservative Party, led by Prime Minister Cánovas, imposed a clearly protectionist policy which was to last until the second half of the twentieth century, but protection was not new to the Spanish economy: Serrano Sanz, *Viraje proteccionista*, pp. 140-70.

<sup>15</sup> Simpson, Spanish agriculture; García-Lombardero, 'Efectos de la protección'; GEHR, Los precios del trigo.

<sup>16</sup> Measured in national currencies and compared with 21% in Italy, 19% in Germany, and 22% in France: O'Brien and Prados de la Escosura, 'Agricultural productivity', tab. 3.

<sup>17</sup> Prados de la Escosura, De imperio a nación; Tortella, Desarrollo económico.

<sup>&</sup>lt;sup>10</sup> Baines suggests that in England and Wales the high emigration of the 1880s cannot be related to the agricultural depression, because the majority of the emigrants in those years came not from the rural counties, but from the urban ones: Baines, *Migration in a mature economy*, pp. 205-10.

What would have been the performance of Spanish agriculture without the tariff? In Tortella's words:

if the protection on wheat had not been so high, the growing imports of cereals would have caused a decrease in the number of wheat farmers, weeding out the less efficient, . . . the absence of tariffs would undoubtedly have forced peasants and landowners to switch to crops other than cereals . . . and a massive exodus of farmers to the urban centres and to foreign countries would have followed.<sup>18</sup>

Gómez Mendoza concurs. 'Had there been free imports', he wrote, 'the agricultural depression of the late nineteenth century would have been far more intense and would have increased emigration. In fact, those who finally did go abroad from the 1950s, would have had to emigrate earlier.'<sup>19</sup> Prados de la Escosura has also pointed out that policies for the protection of cereals resulted in an inefficient allocation of resources and help to explain the persistently high share of the labour force in Spanish agriculture over time.<sup>20</sup> Vicens Vives, a historian much more sympathetic to such policies, remarked that 'without the protectionism imposed in 1891 ... the cereal economy in Castile would have been devastated by much cheaper wheat imported from Australia and Argentina'.<sup>21</sup>

Recently, Simpson has developed a different view and argued that tariffs were not sufficient in themselves to explain the poor performance of Spanish agriculture.<sup>22</sup> Farmers were slow to switch resources out of cereals, not so much because of tariff imposition, but rather because of the limited opportunities for the export of alternative crops, especially olive oil and wine. Simpson argued that if tariffs had encouraged a significant increase in cereal output, population might be expected to be retained in precisely those areas where the area planted with wheat increased, and released where the area contracted. His data show that this was not the case. Between 1886-90 and 1909-12 the rural labour force grew faster in those regions where the area under cereals declined (i.e., the south of the country) mainly because farmers there could switch to other crops, such as olives and wine.23 Out-migration was high in cereal-growing areas between 1909-12 and 1930-5. In regions where small farms predominated (Castile) tariffs encouraged both an extension in the area cultivated and a large fall in farm population. By contrast, in

<sup>18</sup> Tortella, *Desarrollo económico*, p. 59; *idem*, 'Economía española', p. 139. (The translation is mine for all the Spanish quotations.) Nevertheless, the migration of labour to the towns in response to a negative agricultural shock would depress urban wages, lowering the incentive to move.

<sup>19</sup> Gómez Mendoza, 'De la harina al automovil', p. 181.

<sup>20</sup> Prados de la Escosura, *De Imperio a nación*, p. 102. However, although it is true that protecting a sector does attract resources from other sectors, this does not necessarily mean that overall employment will rise. The outcome depends on what happens to employment in other sectors, for example, the export sector.

<sup>21</sup> Vicens Vives, Manual de historia económica, p. 655.

<sup>22</sup> Simpson, 'Did tariffs stifle agriculture?'.

 $^{23}$  According to the estimates by O'Brien and Prados de la Escosura, 'Agricultural productivity', tab. 6, agricultural output per male worker in Spain declined from 38% in 1890 to 32% in 1910 (UK = 100).

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areas of *latifundia*, in the south of the country, the extension of cultivation was accompanied by an increase in the labour force. Simpson's explanation for this paradox is that for the family farm to remain viable in Castile, it was necessary to augment the land-labour ratio and that this was done by releasing labour and increasing the area cultivated. Simpson concluded that any simple argument that represents tariffs as the major obstacle to rural out-migration is incorrect. It can be contended, however, that without the protection to cereals Castilian family farms would have had to switch more quickly to different crops, and the release of labour could have been faster and greater. Higher out-migration would in turn have increased the land-labour ratio even more rapidly. Furthermore, neither adherents of the consensus view that tariffs slowed the rural exodus nor critics of that view (such as Simpson) have formulated an explicit model of their critique of agrarian protectionism in Spain or tested it econometrically.

Thus, the traditional literature argues that tariffs stifled emigration. This assumes that tariffs increased real wages, thereby reducing emigration because the wage gap between home and destination countries also narrowed. Through migration Spanish economic growth could have proceeded more rapidly.<sup>24</sup> But the traditional view may be flawed for two reasons. First, it is theoretically unclear whether tariffs increased or lowered real wages. Only by thinking in terms of a specific-factor model and assuming that the negative effect on demand for labour dominated can an inverse relationship between tariffs and emigration be expected.<sup>25</sup> O'Rourke and Williamson suggest that in peripheral countries with large agricultural sectors the labour demand effects might have dominated when cheap imported grain lowered real wages.<sup>26</sup> Second, even in that case, the effects on emigration from Spain are still not clear because it may have been income constrained, in which case lower wages would have made it difficult to finance the costs of moving abroad. Cheap grain could have stimulated migration within the country by lowering real wages in agriculture, but at the same time that would have reduced emigration from Spain by increasing the cost of long-distance moves. If following imposition of a tariff wages did not decline, since emigration was income constrained, agricultural labour could finance emigration more easily.

As Hatton and Williamson have suggested, potential emigrants from the poorest European countries could be so constrained by their poverty that they could not afford the move; as real wages rose at home, the constraint was slowly released.<sup>27</sup> In their model of European emigration

<sup>&</sup>lt;sup>24</sup> The idea is clearly stated in Prados de la Escosura, *De imperio a nación*. It concurs with Kindleberger, *Europe's postwar growth*, p. 106, which states that emigration 'is the force, which above all others (rising exports, closer association with the rest of the world, capital investment and foreign aid) has been responsible for the rapid growth of all Mediterranean countries' in the postwar period.

<sup>&</sup>lt;sup>25</sup> Caves et al., *World trade*, ch. 6. For a good summary of this model applied to historical events, see O'Rourke, 'European grain invasion'.

<sup>&</sup>lt;sup>26</sup> O'Rourke and Williamson, 'Around the European periphery'.

<sup>&</sup>lt;sup>27</sup> Hatton and Williamson, Age of mass migration, ch. 2.

these authors reject that hypothesis for the Latin countries in general and for Italy in particular, but it could still be that Spain did not closely resemble Italy in that respect. As previous research has shown, one of the most powerful forces explaining regional emigration rates from Spain was the increase in agricultural wages; that is, for many Spanish regions, higher wages had a direct impact on emigration.<sup>28</sup> There is also some contemporary qualitative evidence of young people waiting to receive part of the family inheritance in order to finance the trip to Argentina more easily than by saving from their wages.<sup>29</sup> Furthermore, Hatton and Williamson suggest that if a poverty constraint did affect potential emigrants from Italy, 'it seems to have been released through remittances from previous emigrants rather than through rising real wages at home'.<sup>30</sup> Since in the Spanish case, 'previous emigrants' were very few in the 1880s and the 1890s, it is possible to consider Spanish emigration as being income constrained in the nineteenth century.

The 'sector-specific model' most historians of Spain have in mind clearly predicts a conflict between land and capital because free trade has an uneven impact on returns to different factors of production. Capitalists should have become free traders. Though that happened in Britain, it did not in Germany, Italy, or Spain where protectionist alliances of industrialists and landowners dominated the making of commercial policy in the late nineteenth century. Thus, there is a paradox in land and capital being protectionist; this is considered below.

However, it is hard to believe that Prime Minister Cánovas and the Conservative Party tried deliberately to hurt capital and benefit landowners when they introduced the 1891 tariff in Spain, although landowners formed a powerful pressure group at the time.<sup>31</sup> From the writings of Cánovas it appears that what he had in mind was a 'conservative social welfare function' supplemented with nineteenth-century nationalism.<sup>32</sup> Tariffs will protect unskilled labour and low incomes whenever a sector position is significantly threatened.<sup>33</sup> Throughout history the aim of protection has been the maintenance of sectional incomes and interest. Some historians have argued, however, that the Spanish government had no clear view of commercial policy and that the shape of the protectionist regime in Spain was the outcome of pressure group activity. The model to apply to the formation of Spanish commercial policy would then be the Olsonian model where special groups (landowners and industrialists),

<sup>28</sup> Sánchez-Alonso, Causas de la emigración española, tab. 6.2, p. 257; idem, 'Those who moved'.

<sup>&</sup>lt;sup>29</sup> Fernandez de Pinedo, 'Movimientos migratorios vascos'.

<sup>&</sup>lt;sup>30</sup> Hatton and Williamson, Age of mass migration, p. 106.

<sup>&</sup>lt;sup>31</sup> Varela Ortega, Amigos políticos.

<sup>&</sup>lt;sup>32</sup> Cánovas del Castillo, <sup>6</sup>De cómo yo he venido a ser'. On the concept of 'conservative social welfare function', see Corden, *Trade policy*.

<sup>&</sup>lt;sup>33</sup> The 'urgent necessity to protect labour and national production' is clearly stated in Cánovas del Castillo, 'De cómo yo he venido a ser', but although the issue of unemployment is usually raised by protectionists, there is little evidence in economics that tariffs are useful for protecting overall employment: Caves et al., *World trade*; Corden, 'Cost and consequences'; *idem, Trade policy.* 

acting as rent-seekers, 'invest' rationally in order to secure protection from the state.<sup>34</sup>

How is it possible to explain the paradox that Spanish capitalists conceded protection to agriculture and also demanded protection for themselves? Instead of considering free trade and protection in Spain within the framework of the specific-factor or classical Ricardian models, a simple Heckscher-Ohlin model might be more useful and illuminating in respect of Spanish protection and its effects on labour mobility during the period 1890-1914.

In the Heckscher-Ohlin model both capital and labour are mobile, while in the sector-specific model only labour and changes in commodity prices produce effects on rents and wages.<sup>35</sup> The Heckscher-Ohlin model can be summarized briefly. First, patterns of trade reflect the relative endowment of factors of production. Thus, countries in which labour is relatively abundant tend to export labour intensive commodities, and those in which capital is relatively scarce tend to import capital intensive commodities. Second, free trade tends to equalize commodity prices between countries and also to equalize wages and rents in the home country with those abroad. This is the 'factor price equalization theorem'. What matters for Spanish economic history is the insight of the Heckscher-Ohlin model that commodity trade can serve as a substitute for factor mobility. In other words, international trade and international labour migrations are partial substitutes.

Although the Heckscher-Ohlin model has been criticized on empirical grounds, from Leontief onwards, economic historians have recently shown that for the late nineteenth and early twentieth centuries the model is useful for the explanation of world trade patterns.<sup>36</sup> The model also accounts for trends in relative factor prices over the decades before the First World War.<sup>37</sup> An important extension of the Heckscher-Ohlin model is the Stolper-Samuelson theorem which predicts that 'any interference that drives up the local import price must unambiguously benefit the productive factor used intensively in producing the import competing good.'38 Thus, protection will benefit owners of factors of production with which a given society is poorly endowed, as well as producers who use that scarce factor intensively. Conversely, protection depresses the income of relatively abundant factors of production.<sup>39</sup> European workers, as the abundant factor, should, according to Stolper and Samuelson, have favoured free trade and resisted tariffs. In fact, a majority of Socialist parties in Europe opposed agricultural protection. Furthermore,

<sup>&</sup>lt;sup>34</sup> Fraile, Industrialización y grupos de presión.

<sup>&</sup>lt;sup>35</sup> This argument is based on Caves et al., World trade.

<sup>&</sup>lt;sup>36</sup> For an empirical test of the model, see Estevadeordal, 'Measuring protection'.

<sup>&</sup>lt;sup>37</sup> See O'Rourke and Williamson, 'Late nineteenth century'; O'Rourke et al., 'Mass migration'; O'Rourke et al., 'Factor price convergence'; Estevadeordal, 'Historical essays'; Taylor and Williamson, 'Convergence'.

<sup>&</sup>lt;sup>38</sup> Stolper and Samuelson, 'Protection and real wages', p. 68.

<sup>&</sup>lt;sup>39</sup> It is important to note that whereas the assumption that countries have identical technologies is crucial for the factor price equalization theorem, it is not necessary for the Stolper-Samuelson theorem.

impediments to trade (for example, a tariff) operate to stimulate factor movements (for example, labour). This is most clearly stated in Mundell's work: 'The effect of any trade impediment is to increase the scarcity of the scarce factor and, hence, make more profitable an international redistribution of factors' and therefore, he concludes, 'tariffs will stimulate factor movements'.<sup>40</sup> Economists generally assume that capital is more mobile than labour, but over the period 1870-1914 labour was also highly mobile. Recently, O'Rourke and Williamson have shown from an examination of the three Scandinavian economies with different degrees of protection (Sweden being the one with highest tariffs in the late nineteenth century) that lower tariffs made 'a bigger contribution for trade and a smaller contribution for foreign factor flows in Denmark and Norway, and a smaller contribution for trade and a bigger contribution for factor flows in Sweden ... exactly the kind of substitution between trade and international factor mobility that Heckscher and Ohlin envisaged.'41

Considering the Spanish case in the light of a Heckscher-Ohlin model, land as the relatively scarce factor should have benefited from the introduction of a tariff, and at the same time, increased levels of protection could be expected to be positively related to labour outflow.<sup>42</sup> Thus, it could be the case that by introducing the tariff of 1891 Cánovas stimulated the international migration of Spanish labour, the abundant factor in the country's economy; this was the reverse of what his policy aimed to achieve. By the end of the nineteenth century the Spanish economy was relatively short of capital as well as land. The Heckscher-Ohlin model and the Stolper-Samuelson theorem predict that protection benefits land and capital (the scarce factors) and harms labour (the abundant factor of production). Thus, the paradox of a protectionist alliance between land and capital is resolved. Rogowski's work shows that in countries where both land and capital were scarce and only labour was relatively abundant, an alliance of capitalists and landowners was likely to develop.<sup>43</sup> In Spain, the outcome of a strongly protectionist regime (even the coalition itself) survived until the second half of the twentieth century, when capital became less scarce.44

<sup>43</sup> Rogowski, *Commerce and coalition*, ch. 1. This model is quite convincing for the German, Italian, and Spanish case, but not for France, which 'is a case where you realized that other things also mattered': p. 69. This model also predicts class conflict: workers will end up being politically radical and, where much of the labour is rural, demanding agrarian reform: Rogowski, ibid., p. 38 and passim. For a model based more soundly in political science and applied to French commercial policy, see Verdier, *Democracy and international trade*.

<sup>44</sup> From the theoretical point of view, it can be argued that a country's commercial policy is the result of its underlying factor-ownership distribution. The Heckscher-Ohlin model, which is highly aggregated and frequently associated with long-run production structures, seems most useful in explaining long-run changes in the overall tariff structure: Mayer, 'Endogenous tariff formation'.

<sup>&</sup>lt;sup>40</sup> Mundell, 'International trade', p. 330.

<sup>&</sup>lt;sup>41</sup> O'Rourke and Williamson, 'Education, globalization and catch-up', p. 308, tab. 5.

 $<sup>^{42}</sup>$  Land/labour ratios were 6.9 hectares per worker in 1890 and 6.7 in 1910 for Spain, compared with 39.2 and 44.1 for the US in the same years: O'Brien and Prados de la Escosura, 'Agricultural productivity', tab. 3. The ratio of wages to land values was 123.2 in 1890 and 67.5 in 1910 for Spain (1901 = 100), compared with 84.9 and 115.4 for Britain in the same years (free trader in the Old World), and 103.2 and 64.0 respectively for the US: O'Rourke et al., 'Factor price convergence', tab. 2.

Prados de la Escosura and Tena have also noted that, at the turn of the century, the scarce factor in Spain (land) benefited from an increased demand flowing from protection as it was the factor used intensively in the import-competing sector.<sup>45</sup> Relative to the New World, Spain can be represented as a country in which labour was abundant and land and capital were scarce. Furthermore, since in theory, international trade is a substitute for international factor mobility, it might well be the case that tariffs stimulated the export of Spain's abundant labour. This is an unexpected and counterintuitive implication of theories widely accepted in other contexts, and it means that Simpson's observation that tariffs encouraged a fall in farm population in cereal areas no longer seems paradoxical because impediments to trade led to an outflow of labour. Other arguments-for instance, that regions of high emigration in the north of Spain which were not cereal producers could not have been affected by tariffs on cereals-are also explained. In such areas, free trade would have lowered grain prices which is exactly what farmers in the north wanted so that they could feed their animals more cheaply. Lower grain prices might well have reduced emigration from the north of Spain.

Finally, a more realistic model with three factors of production may be considered: two of them, labour and capital, are mobile but the other, land, is immobile. There are two sectors: agriculture using labour intensively to produce food, and industry using capital intensively to produce manufactures. Let the country be labour abundant and capital scarce, relatively, and assume an increase in the prices of imported food from the imposition of a tariff. This would increase rents paid to landowners, as in the sector-specific model, but also wages in agriculture because in the Heckscher-Ohlin model labour gains when the relative price of labour-intensive goods rises.<sup>46</sup> Since agriculture is labour intensive, an agrarian tariff benefits not only landowners but agricultural workers as well. However, industry will also demand protection because it produces goods by the intensive use of the relatively scarce factor, capital. In addition, industry faces higher wages following the imposition of tariffs on food, so industry demands and obtains protection as well. In a Heckscher-Ohlin model a rise in the prices of the capital-intensive commodities must lower wage rates. In turn, the incentives to move from agriculture to industry have diminished because wages have increased, relatively speaking, in agriculture. Assuming that Spain's potential emigrants of the late nineteenth century were income constrained, higher wages in agriculture could have assisted emigration, by enabling labourers to afford the cost of travel; at the same time, lower wages in industry also stimulated emigration to a country with large wage differentials such as Argentina.<sup>47</sup> Thus, protection for Spanish agriculture and Spanish

<sup>&</sup>lt;sup>45</sup> Prados de la Escosura and Tena, 'Protectionism in Spain'.

<sup>&</sup>lt;sup>46</sup> This result contrasts with the sector-specific model where a mobile factor such as labour cannot significantly alter its real wage through changes in commodity prices, although specific factors definitely can.

<sup>&</sup>lt;sup>47</sup> However, this implies that internal migration and emigration from a country were substitutes, which is not always the case.

industry in the late nineteenth century created conditions for a positive connection between protection and emigration from that country.

To sum up: relations between protection and emigration are not as clear cut as historians of Spain have suggested. Thinking in terms of a specific-factor model and assuming that the negative effect on demand for labour was dominant, an inverse relationship between tariffs and emigration can be expected. But since emigration could be income constrained, following an agrarian tariff, wages did not decline and labour could finance emigration more easily. In a Heckscher-Ohlin model, tariffs, as impediments to trade, stimulated international factor mobility. In the context of the international economy of the late nineteenth century, a direct relationship between tariffs and emigration could be expected. The same result could be expected in the case of a combination of the two models.

III

Tariffs were not the only feature conducive to isolation of the Spanish economy from international markets. The Grupo de Estudios de Historia Rural (hereafter GEHR) has called attention to the role of currency depreciation in reinforcing the impact of the 1891 tariff, and Cortés Conde also pointed out that between 1890 and 1904 the protection derived from the depreciation of the peseta turned out to be more significant than the impact of the tariff delaying emigration from agriculture.<sup>48</sup> Thus, according to the literature, it was a combination of the 1891 tariff and currency depreciation from 1895 until 1905 that reduced emigration from Spain.<sup>49</sup>

The external value of the peseta remained stable between 1883 and 1895, in spite of the abandonment of gold convertibility in 1883.<sup>50</sup> While Spain had a de facto fiduciary standard during those years, the government tried hard to maintain a fiscal and monetary discipline similar to that prevailing under the gold standard.<sup>51</sup> Furthermore, and until 1891, the stability of the peseta was also linked to net inflow of foreign capital.<sup>52</sup> Unfortunately, from 1895 (the beginning of the Cuban War) until 1905, the peseta depreciated by approximately 30 per cent, in consequence of a combination of fiscal disorder, monetary expansion, and a flexible exchange rate.<sup>53</sup> According to Sardá and Tortella, abandoning the gold standard was the best option for a backward country such as Spain, but Tortella recognized that a flexible standard reinforced the impact of the

<sup>&</sup>lt;sup>48</sup> GEHR, Los precios del trigo; Cortés Conde, 'Migración, cambio agrícola'.

<sup>&</sup>lt;sup>49</sup> Sánchez-Alonso, Causas de la emigración, ch. 5.

<sup>&</sup>lt;sup>50</sup> Spain never officially adopted the gold standard. Convertibility of paper money into gold and/or silver was maintained until 1883, when it was suspended, and never resumed. Martín Aceña, 'Spain during the classical gold standard'.

<sup>&</sup>lt;sup>51</sup> Tortella, *Desarrollo económico*, ch. 7.

<sup>&</sup>lt;sup>52</sup> As shown by a recent estimate of the Spanish balance of payments: L. Prados de la Escosura, 'El sector exterior y el atraso económico español, 1815-1913' (unpub. paper, 1997).

<sup>53</sup> Martín Aceña, 'España y el patrón oro'; idem, 'Spain during the gold standard years'.

1891 tariff by increasing the isolation of the Spanish economy.<sup>54</sup> Martín Aceña added that to be off the gold standard isolated Spain from the world economy, especially from the inflows of international capital investment in the 1880s and 1890s, an argument further developed by Bordo and Rockoff, so currency instability following the abandonment of the gold standard helped to isolate Spain from international capital markets.<sup>55</sup> Inflows resumed after 1904-5 when the peseta recovered rapidly following a conversion of the external debt and the introduction of fiscal reform.

The combined impact of devaluation and tariffs made imports more expensive during the decade from the mid-1890s. According to the GEHR, before 1890 and after 1906 tariffs played the leading role in protecting Spanish farmers from cheap grain, but between 1892 and 1905 devaluation of the peseta was more important. Those years became 'a period of absolute protectionism'.<sup>56</sup> The effects of depreciation were not alleviated by differing rates of inflation between Spain and the rest of the world.<sup>57</sup> When the peseta recovered after 1904, foreign wheat once again became a serious threat to Spanish farmers and the government raised tariffs in 1906.<sup>58</sup> After the 1906 tariff imposition, emigration reached its peak once the peseta began to recover from its depreciation. This view implies that Spain in those years enjoyed a kind of 'exchange rate protection'.<sup>59</sup> Figure 2 correlates fluctuations of emigration and the rate of exchange.



Figure 2. Indexes of emigration from Spain and real rate of exchange of peseta, 1880-1914 (1913 = 100)

Sources: for emigration, Sánchez-Alonso, Causas de la emigración, app. A3; for rate of exchange, Prados de la Escosura and Tena, 'Protectionism in Spain'

- 54 Sardá, Política monetaria; Tortella, Desarrollo económico, pp. 176-7.
- <sup>55</sup> Martín Aceña, 'Spain during the gold standard years'; Bordo and Rockoff, 'Gold standard'.
- <sup>56</sup> GEHR, Los precios del trigo, p. 98.
- <sup>57</sup> Prados de la Escosura and Tena, 'Protectionism in Spain'.
- <sup>58</sup> Ibid.

<sup>59</sup> Corden, 'Exchange rate protection'. For the purpose of the present argument, the distinction between currency depreciation and devaluation is irrelevant.

Depreciation changes the relative price of traded goods, whether exports or imports, relative to non-tradables. Furthermore, devaluations are expected to have a clearly expansionary effect on output and employment. Devaluation increases the price of tradables and hence lowers real wages if nominal wages are sticky. Migration theory predicts that the lower the wage the higher the emigration, but if emigration is income constrained the relationship between low wages and low emigration will be positive. The inverted-U model for emigration from a country developed by Hatton and Williamson predicts a direct relation between low real wages and low levels of emigration.<sup>60</sup> Thus large wage gaps between home country and country of destination can be consistent with low emigration rates. Recent research has shown that Spanish wages in some regions were so low that they hindered emigration from Spain;<sup>61</sup> this seems clearly to be constrained by low levels of income. Up to the 1880s Spanish emigration levels had remained very low, so few pioneers sent remittances or prepaid tickets to finance the moves of relatives and friends. In the Spanish case chain migration was mainly a twentieth-century phenomenon as the process of diffusion took place.

In microeconomic terms, the effects of currency depreciation on individual emigrants are complex. On the one hand, the depreciating 'home' currency benefits emigrants already working in the country of destination and sending remittances home, and is not as beneficial to future emigrants or those who have already emigrated and do not intend to return with savings. On the other hand, for potential emigrants still at home, currency depreciation can be represented as adverse and an obstacle. It clearly affected the price of tickets, since the main shipping companies fixed their prices in currencies linked to gold.<sup>62</sup> It also lowered the value of savings of an emigrant searching for a new job in a country of destination. Emigration from Spain had long been low because low wages provided surpluses inadequate to finance emigration. Currency depreciation made the situation worse for potential emigrants. Since the peseta fell in value on average by nearly 30 per cent between 1892 and 1905, it can be assumed that emigration costs in those years were 30 per cent higher. Tickets from Galicia to the River Plate cost approximately  $f_{.9.8}$  in the 1880s. In current pesetas, fares increased, as a result of depreciation, from 250.9 pesetas in the 1880s to 321 pesetas in 1892-1905.63 For an agricultural worker in Galicia and Asturias (regions of high emigration) whose daily wage was around 1.65 pesetas in 1896-7, the cost of the trip, measured in number of working days, increased from 153 in the

<sup>63</sup> Prices refer to the cheapest fares from Galicia to Buenos Aires: ibid.

<sup>&</sup>lt;sup>60</sup> Hatton and Williamson, 'What drove the mass migrations?'.

<sup>&</sup>lt;sup>61</sup> Even at the turn of the century an increase in agricultural wages between 1896 and 1908 had a strong direct effect on provincial rates of emigration by province: Sánchez-Alonso, 'Those who moved'; *idem, Causas de la emigración*, tab. 6.1, p. 257.

<sup>&</sup>lt;sup>62</sup> From 1880s onwards most of Spain's emigrants were transported by British, German, and French companies: Royal Mail Steam Packet Company, Pacific Steam Navigation Company, Nelson Steam Navigation Company, Hamburg Amerika Line, Norddeutscher Lloyd, and Chargeurs Réunis. Only two companies flew the Spanish flag: Vázquez Gonzalez, 'Emigración gallega', pp. 92-3.

1880s to 195 in 1892-1905, with a working year of around 250 days.<sup>64</sup> Allowance must also be made for earnings forgone during the trip (around 20 extra days) and the cost of settling in the receiving country.<sup>65</sup> Furthermore, the Baring crisis in Argentina (a favoured destination for Spaniards in the late 1880s) led to a marked depreciation of the Argentinian peso during the years 1891-9,<sup>66</sup> clearly affecting the remittances (including prepaid tickets) from Argentina. Once the peso recovered, Argentina regained its position as an attractive destination for Spanish emigrants although the depreciation of the peseta then increased the costs of moving.<sup>67</sup>

Currency depreciation in late nineteenth-century Spain could be inversely related to emigration from the country. At the macro level, depreciation could have had the effect of 'exchange rate protection' and maintained levels of employment in agriculture. Depreciation also lowered real wages and the ratio of wages to ticket cost fell. Both forces seem to have been at work in the Spanish case. As emigration was income constrained, depreciation lowered out-migration to the New World, an effect compounded by the depreciation of the Argentinian peso in the 1890s.

IV

The aim of this section is to test the three main hypotheses outlined above. Did the tariff protection of agriculture have a negative impact on labour mobility and retard Spanish emigration, as historians have often claimed? Did currency depreciation, by increasing the costs of emigration, also contribute to the slow-down of Spanish emigration at the end of the nineteenth century? Did these effects operate because Spanish emigration was income constrained?

Table 2 reports the regression results for the period 1882-1914. Monetary depreciation needs to be separated from tariffs to allow measurement of their different impacts on rates of emigration.<sup>68</sup> Protection is proxied by the nominal tariff on wheat.<sup>69</sup> This was the most important crop produced by Spanish agriculture, which in turn was the most important sector of the country's economy. Trends in agricultural and industrial protection appear very similar and Tena's recent work confirms that

<sup>69</sup> The figure for nominal average protection (i.e., customs revenues as a share of imports) was included in preliminary tests but it did not give significant results. It is well known that this is a poor index of protection as it can conceal the prohibitionist effect of a tariff.

<sup>&</sup>lt;sup>64</sup> Agricultural daily wages are taken from Sánchez-Alonso, *Causas de la emigración*, app.; average working days from Vandellós, 'La richesse et le revenu', p. 119.

<sup>&</sup>lt;sup>65</sup> The length of the trip hardly changed (decreasing from 23 days to 20) between the 1880s and the 1890s: Moya, *Cousins and strangers*, p. 38.

<sup>&</sup>lt;sup>66</sup> Cortés Conde, *El progreso argentino*, pp. 95-100.

<sup>&</sup>lt;sup>67</sup> Even during the crisis of the 1890s Argentina remained the major destination for Spanish emigrants. After 1894 Cuba became less attractive because of the war of independence, and Brazil and Uruguay continued to be secondary destinations: Sánchez-Alonso, *Causas de la emigración*, ch. 4.

<sup>&</sup>lt;sup>68</sup> In an earlier work, Sánchez-Alonso, *Causas de la emigración*, tabs. 5.2, 5.4, the two variables were mixed so the result was confusing.

2		6.006
Constant		-6.206
Deviations from trend in Argentine con-	(-1.598) 0.303	
Wage ratio Argentina/Spain		(1.833) 1.400 (2.525)
Real depreciation of peseta		(3.537) -1.187
Nominal wheat protection		(-2.134) 2.776
Log real wage in Spain		(2.355) 1.924 (2.208)
Lagged emigration rate		(2.208) 0.421 (2.116)
R <sup>2</sup>	0.816	()
R <sup>2</sup> adjusted	0.772	
S.E. regression	0.256	
D.W.	2.000	
<i>F</i> -statistic	18.444	

Table 2. Determinants of Spanish intercontinental emigration,1882-1914<sup>a</sup>

Notes: t-statistics are in parentheses

All the variables are expressed in natural logarithms and lagged (t-1). Construction output in Argentina and real depreciation of the peseta are normalized 1913 = 100.

*a* Unit Root Tests for the variables in the equation are presented in the appendix, below, p. 328. In all cases the variables considered are integrated of order one. The Johansen Cointegration Test for the combination of the variables in the equation was carried out and accepts the hypothesis that the residuals are cointegrated.

Sources: Dependent variable is the rate of gross emigration to population, from Sánchez-Alonso, *Causas de la emigración*, app. A.3. Construction output in Argentina from Cortés Conde, *La economía argentina*. Real wage differential between Argentina and Spain from Williamson, 'Evolution of global labor markets'. Real depreciation of the peseta is a coefficient of the depreciation adjusted by the inflation differential, from Prados de la Escosura and Tena, 'Protectionism in Spain'. Nominal wheat protection is the ratio of wheat tariff to wheat price in Spain plus 1, from GEHR, *Los precios del trigo*. Real wage in Spain from Williamson, 'Evolution of global labor markets' (also using unpub. 1996 amendment by Williamson, 'Revision of appendix 1: nominal wage, cost of living and real wage series').

nominal protection closely resembled effective protection.<sup>70</sup> The income constrained hypothesis will be tested by including Spanish real wages, a more relevant variable than per caput income for potential emigrants. Foreign activity relates to the main country of destination, Argentina. The variable used is deviations from trend in output construction, a sector which has high demand for unskilled labour and is very sensitive to economic fluctuations. Two classical variables used to explain emigration from European countries have also been included: the wage ratio between Argentina (the main destination for Spanish emigrants) and Spain and the lagged emigration rate. The rate of natural increase lagged 20 years was also included in previous estimations but it proved not significant and it is not reported here. The classical hypothesis of demographic forces driving up emigration can be rejected for the Spanish case, a result consistent with previous research by Hatton and Williamson.<sup>71</sup>

<sup>&</sup>lt;sup>70</sup> A. Tena, 'Protección y crecimiento económico en la España de la Restauración, 1870-1930' (unpub. MS., 1998).

<sup>&</sup>lt;sup>71</sup> Hatton and Williamson, Age of mass migration, pp. 44-5, tab. 3.5.

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All the variables are lagged one year because it is assumed that potential emigrants made a delayed response to changes at home and abroad.

Several conclusions can be drawn from table 2. Economic conditions in Argentina were a significant determinant of the migratory flow. For example, the influence of construction output (a sector prone to shortterm fluctuations in its demand for unskilled labour) is positive and significant. Furthermore, the wage differential between Spain and Argentina is strongly significant. Spanish emigration reacted more than proportionally to wage differentials in the same way as did that from Italy or other European emigration countries. Both variables yield results in line with research done for other countries.<sup>72</sup> At the same time, absolute levels of wages in Spain display a strong effect on emigration, in fact higher than that of the wage differential. The hypothesis that Spanish emigration was income constrained is supported by the statistical results. Given the low levels of income for potential emigrants from Spain, increases in real wages at home are positively associated with emigration because such increases allowed the population to finance the move more easily. A 10 per cent increase in real wages in Spain would have increased emigration by 0.3 per thousand [(0.1\*1.924)/(1-0.421)]. The lagged emigration rate is also positively related to emigration, as is always the case. Hence, earlier emigrants could have released the poverty constraint, financing the moves of others but not to the extent to which they apparently did so in Italy.73

The protection variable is positive and highly significant. The emigration variable displays higher elasticity in relation to protection than is the case for real depreciation. Nevertheless, a positive value would not be anticipated by most historians of Spain and is not predicted by the sector specific model unless account is taken of the fact that tariffs maintained agricultural wages; so, since Spanish emigration was income constrained, labour could finance the move abroad more easily. But the result is clearly predictable in terms of the Heckscher-Ohlin model and the Stolper-Samuelson theorem, both of which predict a direct relationship between tariffs and emigration. The results set out in table 2 confirm the suggestion that tariffs, by preventing trade, promoted emigration, particularly for the years after 1900. A 10 per cent increase in protection would lead to an increase in external emigration of nearly 0.5 per thousand [(0.1\*2.776)/(1-0.421)].

Finally, emigration displays a negative and significant relation to the depreciation of the peseta. Indeed, the depreciation between 1891 and 1905 turns out to be the distinctive feature of the Spanish economy at the turn of the century compared with economies such as that of Italy.<sup>74</sup> Currency depreciation increased the price of the tickets and reduced the savings on which the emigrants subsisted while searching for new jobs in

<sup>&</sup>lt;sup>72</sup> Ibid., chs. 5, 6.

<sup>&</sup>lt;sup>73</sup> Ibid., ch. 6, p. 106.

<sup>&</sup>lt;sup>74</sup> Although the Italian lire also depreciated at the end of the nineteenth century, it did so to a lesser extent than the peseta and during a shorter period of time. See Sánchez-Alonso, 'What slowed down mass emigration?'.

the country of destination, and it was particularly adverse for the majority of potential emigrants due to low levels of income. A 10 per cent change in the real depreciation variable would have reduced the emigration rate by 0.2 per thousand population [(0.1\*-1.187)/(1-0.421)].

In order to quantify the effects on emigration of depreciation and protection, a simulation exercise has been carried out based on the counterfactual scenario that the value of the peseta has remained as it was in 1882, that is, before the abandonment of gold convertibility, and that the level of protection had remained unchanged at the level of that year. This static simulation exercise generates lower bound estimates for the volume of additional emigration that might have taken place in the absence of currency depreciation and of tariff changes.

Table 3. Counterfactual emigration under no depreciation and no increase in<br/>protection after 1882<sup>a</sup>

Panel A. Hypothesis of no depreciation				
	(1) 1883-1914	(2) 1883-1891	(3) 1892-1905	(4) 1906-1914
% change in forecast value Emigration change in absolute terms ('000)	24.2 738	1.9 11.4	41.5 429	20.8 298
Panel B. Hypothesis of no increas in protection	se			
	1883-1914	1882-1891	1892-1905	1906-1914
% change in forecast value Emigration change in absolute terms ('000)	-22.6 -692	-11.2 -66	-24.0 -248	-26.4 -378

*Note: a* Forecast values were computed by applying the parameters of equation to the yearly values of each independent variable. Counterfactual values were computed by the same procedure, except for the depreciation and the protection variable for which the 1882 value was kept fixed alternatively. Spain abandoned gold convertibility in 1883 and adopted a high protectionist tariff in 1891.

Sources: values from tab. 2

For 1892-1905, when the peseta fell sharply, the values in column (3) of panel A (table 3) show that, in the absence of depreciation, emigration could have been over 40 per cent higher. Approximately 400,000 additional people might have emigrated in those years. Figure 3 suggests, again, that far higher emigration rates could have been attained between 1892 and 1905 in the absence of depreciation. The gross rate of emigration from Spain could have been 5.6 per thousand of population, very similar to the Italian rate over the period 1890-1904. Furthermore, the emigration rate for 1906-14, at 20 per cent higher, would have allowed Spain to reach the Italian rate of emigration in that period, 11 per thousand (table 1).

For reasons elaborated above, under the counterfactual scenario of no protection, emigration could have been reduced by nearly 700,000 during the period 1883-1914 (panel B)—a figure very similar to the increase simulated for the same period in panel A. Over the whole period the



Figure 3. Forecast and counterfactual emigration from Spain (no depreciation), 1883-1914 Sources: see text, section IV

two forces, protection and depreciation, acted to cancel each other out. However, during the years of high depreciation, 1892-1905, emigration would have risen by almost 200,000, even with the countervailing effect of protection. These counterfactual estimates are, however, a lower bound conjecture and they do not take into account possible dynamic effects. It is plausible to suggest that agricultural output per worker and wage rates could have increased had emigration rates been higher, assuming a plausible very low marginal productivity of labour employed in agriculture. The extra emigrants could also have prompted 'pull' effects through remittances, pre-paid tickets, and chain migration. Given that one of the problems for economic development in the long run was the slow release of labour from agriculture, higher emigration from Spain during years of favourable international conditions for international labour mobility could well have had positive effects both on agricultural development and on the overall macroeconomic performance of the Spanish economy. In a period of falling international prices, monetary forces rather than tariff policies isolated the Spanish economy and reduced emigration from Spain. The Spanish population missed an opportunity to raise its standard of living by emigration. However, this is not the sole explanation for low levels of exodus from the countryside. Institutional factors in Spanish agriculture must also be taken into account. Slow urban and industrial development was also, and perhaps mainly, responsible for the lack of pull from the industrial and urban sectors.<sup>75</sup> Indeed, internal migrations

<sup>&</sup>lt;sup>75</sup> Pérez Moreda, 'Evolución demográfica'; Tortella, 'Agriculture'; Prados de la Escosura, De imperio a nación.

remained at very low levels until the 1920s and as late as 1930 the ruralurban wage gap was almost as large as it was in 1860.76

This article has attempted to analyse and quantify obstacles to Spain's closer integration into the world economy between 1880 and 1914. It has focused on international labour mobility and it has two central hypotheses: first, protection of agriculture restrained labour emigration; second, currency depreciation increased the cost of moving abroad and slowed Spanish emigration in the late nineteenth century. Underlying these hypotheses the article has a central assumption, that is, that Spanish emigration was income constrained.

The subject literature regards the protectionist policies adopted and followed from 1891 onwards as a major part of the explanations for the slow out-migration from agriculture. But that view is based upon an implicit sector-specific model and assumes that the negative labour demand effect dominated; it concludes that relations between tariffs and emigration must have been inverse. If, however, the Spanish economy in the late nineteenth century is represented in terms of the Heckscher-Ohlin model and the Stolper-Samuelson theorem, it can be shown that tariffs impeded trade and stimulated labour mobility.

Nevertheless, the most important element in the explanation for the slow emigration from Spain in 1892-1905 was not so much the tariff, but the depreciation of the peseta. For income constrained emigrants currency depreciation increased the cost of moving. Unfortunately, favourable international conditions for intercontinental emigration came to an end with the First World War. Thus, the Spanish economy missed an opportunity. Furthermore, econometric calculations suggest that if the peseta had not depreciated, emigration from Spain could have risen by nearly 25 per cent. These 'counterfactual emigrants' could, in turn, have pulled even more workers across the Atlantic through chain migration, pre-paid tickets, and remittances. Indeed, without the currency depreciation, rates of emigration from Spain would have been very similar to those from Italy over the period 1892-1914. Furthermore, since the large proportion of labour employed in agriculture is one of the enduring features of Spanish backwardness, higher emigration from Spain could have exercised only positive effects on long-term economic development. Spanish emigrants had to wait until the second age of economic convergence after 1950 when they travelled to destinations within Europe. Even then, they 'missed' opportunities in the 1950s but took them up in the 1960s. That episode is, however, another story.

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<sup>&</sup>lt;sup>76</sup> Simpson, Spanish agriculture, tab. 8.7. Between 1887 and 1910 the proportion of the population living outside the province of birth changed from 8% to 9%: Pérez Moreda, 'Evolución demográfica'.

#### BLANCA SÁNCHEZ-ALONSO

## **APPENDIX:** Econometrics (table 2)

The order of integration of the variables used has been analysed using the Dickey-Fuller test, including a constant and a trend. All variables are integrated of order one, I (1), that is, its first difference does not contain a unit root. The hypothesis of a unit root is rejected at the 1 per cent confidence level. The results of the tests carried out are the following:

#### A. Variables in levels

Variables	Augmented Dickey-Fuller t-statistic	MacKinnon critical values at 5% level	Durbin Watson regression
Rate of emigration	-2.11	-3.56	1.86
Real depreciation of peseta	-1.16	-3.54	1.98
Nominal wheat protection	-2.78	-3.55	1.75
Wage ratio Argentina/Spain	-1.89	-3.55	2.16
Real wage in Spain	-0.78	-3.55	1.96
Construction output in Argentina	-3.26	-3.62	1.90

B. Variables in first differences

Variables	Augmented Dickey-Fuller t-statistic	MacKinnon critical values at 1% level	Durbin Watson regression
Rate of emigration	-3.89	-3.55*	1.86
Real depreciation of peseta	-4.73	-4.26	1.99
Nominal wheat protection	-4.38	-4.26	1.98
Wage ratio Argentina/Spain	-6.06	-4.26	2.25
Real wage in Spain	-4.71	-4.26	1.95
Construction output in Argentina	-5.16	-3.64	2.05

\*Not significant at 1% level, but is so at 5%

The Johansen Cointegration Test for the variables included in the equation presented in table 2 has then been computed. The cointegration exercise tests whether multiple series are cointegrated. If it can be shown that the series operating in the equation are cointegrated, this will be a sign of the stability of the parameters; that is, the cointegration technique makes it possible to establish whether a group of non-stationary variables can be combined in a linear form to produce a stationary variable. If this is the case, the non-stationary variables are cointegrated. Its normal interpretation is as a long-run equilibrium relationship.

The Johansen Cointegration Test for the equation presented in table 2 is the following:

Eigenvalue	Likelihood ratio	5% critical value	1% critical value	Hypothesized no. of CE(s)
0.779	128.74	94.15	103.18	None**

\*\* denotes rejection of the hypothesis of no cointegration at the 1% significance level

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