Geography, trade and regional development: the role of wage costs, exchange rates and currency/capital movements

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Abstract

Existing theories of geographical specialization and trade can be classified into four groups: supply-side; demand-side; endogenous growth; and institutional models. In the recent past economic geographers have paid little attention to earlier regional economic analysis and concentrated for the most part on detailed examination of production structures, the chains linking upstream and downstream activities into production and value networks, clusters, institutions and more recently economic evolution. As a result existing economic geography is ill-equipped to deal with the impact of some aspects of the evolution of costs, exchange rates, trade, capital flows on regional development and pays relatively little attention to economic calculation. Geographical economics includes an underlying theory of trade and micro-foundations, yet its supply-side approach neglects the role of monetary and demand-side (except in gravity models of trade) factors. The aim of this paper is argue for an extension of existing theoretical frameworks to embrace these issues in the light of recent trends in global economic geography and successive financial and debt crises that have stricken the developed world.

Introduction

Efficiency wage costs, exchange rates and currency and capital movements profoundly shape the world economy. Recently however economic geographers (EG) and to a lesser extent geographical economists (GE) have paid relatively little attention to these drivers of the geography of economic activities, area specialization, trade and regional dynamics. The aim of this paper is to help fill this gap, emphasizing the continuing importance of some older ideas, while amending them to incorporate normally unexamined adjustment mechanisms and monetary and demand side factors.

In the past EG drew mainly on a series of theories of the location of economic activities that rested on neoclassical theories of profit maximising firms and utility maximising consumers, while urban and regional economics included macroeconomic theories of the overall trajectories of urban and
regional economies. Earlier commercial geography paid considerable attention to specialisation and trade, yet when theoretical explanation was sought geographers simply drew on the economics profession’s theories of comparative advantage (Chisholm, 1966). More recent research has for the most part adopted new points of departure, and in some cases an engagement with other disciplines such as management (Porter, 1990). A rapid succession of approaches have significantly helped explain the dynamism of local economies: transaction cost approaches (Scott, 1988); analyses of Marshallian knowledge spillovers, dense labour markets, backward and forward linkages and industrial districts (Becattini et al., 2009); analyses of regional embeddedness (Granovetter, 1985); studies of innovation, technology and knowledge-creation and diffusion (Bathelt, Malmberg and Maskell, 2004); analyses of external economies and untraded interdependencies (Storper, 1995); relational economic geography that concentrates on connections, relations, ties and networks (see Sunley, 2008); networks and chains (Coe et al, 2004); institutional economic geography (Amin and Thrift, 1995); analyses of regional competitiveness; evolutionary economic geography with its concern with path dependence and technological lock-in (David, 1985; Nelson and Winter, 1982; Arthur, 1994; Martin and Sunley, 2006; 2007; Martin, 2010 ); studies of the routines of firms (Boschma and Lambooy, 1999; Boschma, 2004; Boschma and Frenken, 2006); and analyses of regional resilience (Martin, 2011; Martin and Simmie, 2010). These approaches have prompted a renewed interest in concepts of cumulative causation refining some of the original concepts in the shape of ideas about path dependence.

These theories however have little to say about the reshaping of global economic geography and are unable to provide an ‘insight [in]to connecting factors between evolutionary economic geography and concepts from urban and regional economics’ (Heblich, 2011). As MacKinnon et al. (2009) point out these approaches concentrate on micro-scale actors, routines, networks and processes. Overall costs and profitability relative to national and global rivals receive however relatively little attention: the richness of analyses of actors and institutions should not lead economic geographers to overlook the significance of costs, cost recovery, profitability and the factors that shape them including a currency’s exchange value: sustained low exchange rates of East Asian currencies in the years that followed the Asian financial crisis were important drivers of relative competitiveness and of geographies of economic activities, while Italy’s adoption of the Euro closed off the option of devaluation that had long helped sustain the competitiveness of Italian industrial districts. These theories also concentrate on the immediate environment. An examination of temporal movements and spatial variations in comparative development requires however that attention be paid to a multi-scalar context which brings into play distant rivals and meso- and macro-level trends and conditions relating to investment, demand and costs. These considerations play some part in global value chain and global production network research (Henderson et al., 2002; Coe et al., 2010; Coe, 2012:390,395), yet its analytical core is underdeveloped and requires an analytical re-interpretation of theories of absolute and comparative advantage.

The new GE also recognises the significance of cumulative causation and endogenous growth offering a dynamic approach to the evolution of economic landscapes. In addition it seeks to establish microfoundations, albeit based on individual optimising behaviour. In other respects however it is quite different. GE uses formal modelling methods, yet more importantly for this paper it grew out of the increasing returns revolution in trade theory, and can be seen as an attempt to go behind Heckscher-Ohlin (HO) theories of trade: while HO theories see specialization and trade as driven by resource endowments, GE shows that second nature (humanly created) resource
endowments are results of the creation of underlying economic and demographic landscapes (Krugman, 1991; Fujita et al., 1999). In developing international trade models GE confines itself, however, to modelling the impacts of backward and forward linkages (external economies) and transport costs on industrial specialization in worlds in which labour is internationally immobile. If logistic costs including the costs of currency transactions were used, these models could incorporate exchange rates and some other border costs, yet this step would not overcome the omission of some vital adjustment issues.

These GE models embody a predominantly real, supply side approach, and involve the consideration of some drivers of growth as exogenous. All economies are considered to be in, or near and approaching, a state of equilibrium in which all resources are fully and efficiently utilised. In a world of increasing returns however, the mechanisms driving change are largely endogenous and cumulative. Full employment is far from guaranteed. Changes in the use of resources and in production organisation are not just equilibrating but also disequilibrating creating new opportunities and altering development pathways (Kaldor, 1972).

More specifically, economic development processes can be viewed as a never-ending interaction in which changes in supply give rise to changes in demand, and changes in demand give rise to changes in supply. A decision to increase the production of one commodity gives rise to changes in the demand for inputs, complements and substitutes, and increases expenditure and the income of their producers. An increase in credit creates deposits and permits increased investment expenditure, modifying the structure of employment, and increasing the supply of goods which, if sold, raise incomes to generate the savings required to repay the initial investment finance.

In this conception of decentralised economic systems, growth is largely directed by the evolution of demand rather than by the capacity to produce as in supply-side theories. Changes in the capacity to produce depend on the accumulation of physical and human capital and the speed of technological progress which themselves depend upon investment expenditure and the provision of credit. Investment expenditure is a component of aggregate demand: not only therefore do demand determine short-term growth when an economy is operating at less than full capacity; growth in the long-term depends upon the succession of decisions about investment and other components of aggregate demand. Added together these decisions give rise to constant shifts in the speed and direction of development, adverse shocks and periodic crises that require adaptation and adjustment. An adverse shock can cause one country to lose industries to another with ‘no mechanism for the return of these industries’ once the shock is absorbed (Fujita et al., 1999: 304). Amongst these adjustment mechanisms that shape economic trajectories are shifts in efficiency wage costs, exchange rates and currency and capital movements that we shall examine in this paper.

The rest of the paper proceeds in the following way. To justify consideration of these mechanisms the next section sets out a set of stylised facts about recent economic development that economic geography should see to explain. In the third section

2 World economic geography and the performance of regional economies
A reason why it is surprising that recent economic geography theories have paid relatively little attention to exchange rates, investment, cost competition and trade is that these drivers have
played a profound role in reshaping world economic geography and the performance of regional economies.

The economic crisis of the 1970s saw major changes in the trajectories of national and regional economies. Up until that point in time, in developed countries, the growth of domestic demand played a major role in driving economic growth and development. In the case of the United States (US) exports stood at just 5.2% of Gross Domestic Product (GDP) in 1960 and 5.8% in 1970, while in the EURO zone it stood at 18.6% in 1960 and 19.8% in 1970. The 1970s crisis and neo-liberal globalization saw a significant reorientation of growth and development towards external markets: in the case of developed countries, increased wage costs and social conflict saw significant outward flows of investment to lower cost countries, while imports and exports increased as shares of regional and national output and employment. In the case of the US and the EURO zone, exports reached 12.7% and 41.1% respectively in 2007 (OECD, various years).

At the root of these transformations were a number of factors. In the case of the EURO zone economic integration was an important factor. Of more general importance however were gaping global disparities in wealth and income. These disparities meant that relocation in low cost countries could generate large reductions in efficiency wages at international exchange rates, although a large-scale geographical redistribution of economic activities could not have taken place without significant investments in improved communications and the general conditions of production and exchange, and increased global economic and political integration. Complementary shifts accordingly occurred in less developed countries. From the 1930s until 1960s many developing countries had pursued strategies of import substitution designed to replace imports with domestically-produced goods and services (Hirschman, 1968). At the end of the 1950s and in the 1960s the small East Asian Tiger economies adopted export-oriented growth strategies (Amsden, 1985; Balassa, 1978). Their subsequent achievement of high and sustained growth rates saw a more general move away from import substitution and towards export promotion.

The 1997 Asian crisis led initially to a certain degree of scepticism about the real strengths of Asian growth. Indeed a number of economists concluded from growth accounting exercises that Asian growth reflected perspiration rather than inspiration, and that their rise would fade much as the rise of the Soviet bloc faded after the 1970s (Krugman, 1998; see also Young, 1992).

In the event the Asian crisis and its sequels in Russia, Brazil and Argentina helped change emerging-developed country relationships and the course of global development. The Asian economies responded strongly to the dangers of financial liberalization and dollar debts, altering their model of development to emerge with trade surpluses and as creditors of the United States and other developed capitalist economies. Asian domestic markets declined in importance, as Asian manufacturers reduced prices and increased export volumes: excess capacities of production, compressed margins and currency depreciation made these countries formidable trade competitors, and drove down world prices. The arrival of cheap imported goods put strong downward pressure on profitability in developed countries, and encouraged recourse to financially-driven growth. In 1998-2000 a speculative financial boom associated with over-optimistic projections of internet-led growth encouraged household consumption and firm investment in new projects, generating serious problems of overproduction. Surprisingly the Anglo-American economies responded quickly to the dotcom crisis: the monetary policy of the authorities drove down interest rates, credit markets were
liberalized and a large inflow of savings from Asian and oil producing economies with large trade surpluses saw an explosion in the supply of credit, underpinned by house price increases to which credit expansion contributed. The consequences were twofold. The first was an extraordinary polarization of trade surpluses and deficits (globally and inside of trading blocs such as the European Union). The second was a dramatic increase in the foreign exchange holdings of emerging economies such as China enabling them to embark on processes of internationalization (Figure 1).

Figure 1: Current account balance in different regions, 1980-2008. Elaborated from International Monetary Fund (IMF), 2010

These imbalances have led to intense arguments about the exchange rate of surplus economies such as China and to sovereign debt crises in deficit countries such as Greece, Spain, Portugal and Ireland in the Euro zone. China strongly resists Western pressure to increase its exchange rate in part in the light of the Japanese experience. After the 1985 Plaza Accord, a sharp appreciation of the Yen caused a recession (Figure 2). A macroeconomic programme to stimulate growth resulted in credit growth and soaring asset values. In 1990 the financial bubble burst opening the way to two lost decades marked by dismal economic performance. As far as Euroland is concerned, current
Mediterranean sovereign debt crises are connected with the inability of their currencies to continue fall in value to restore competitiveness after adoption of the Euro (Figure 2; Dunford and Yeung, 2011).

Figure 2 Evolution of US$ exchange rates (Index numbers, 1960=100) Source: elaborated from OECD, 2011.

Asian cost competition is also reflected in increasing international trade frictions with Europe and the United States in a wide range of sectors. In October 2011 Germany’s Solar World AG’s US subsidiary fronted a petition alleging that Chinese companies are selling solar cells and modules at prices below costs of production and have received 200 government subsidies. The petition was prompted by several factors. One was the bankruptcy of Solyndra, a solar panel maker that received a $0.5 billion US federal government loan, and two other companies. Another was soaring Chinese imports rising from $21.3 million in 2005 to $2.65 billion in 2011. In December 2011 the US USITC upheld the complaint, opening the way for the US Department of Commerce to impose proposed antidumping and countervailing duties. Shortly after in Gemany’s Solar Valley Q-Cells filed for bankruptcy, while Solar World announced its intention to instigate trade investigations in the European Union, prompting Chinese concerns about a looming trade war (Dunford et al., 2013).

3 Conceptualising regional economies in a differentially integrated global order
These developments indicate the importance of exchange rates, investment, cost competition, trade and growth considerations that have played a relatively small role in recent economic geography. There are several reasons for these absences: geographers have paid little attention to trade (Andresen, 2010; Sheppard, 2012); research that deals with value chains and geographies of trade does not deal with trade theories (Sheppard, 2012); while EG concentrates on real or institutional, micro-economic supply-side approaches to the study of economic development.

To deal with these developments, existing EG theories must be extended to embrace a number of issues: monetary issues associated with the polarisation of surpluses and deficits and the growing importance of Sovereign Wealth Funds accumulated by surplus countries; adjustment issues
including movements in exchange rates, wages and currencies; and demand-side mechanisms which involve connecting the supply side with income distribution, investment and market demand (Hudson, 2005: 21-37).

Figure 3 outlines a conceptual framework that embraces many of the issues that require attention in making sense of the dynamics of regional economies integrated into a global order. Existing EG and GE theories explore the evolution of resource endowments and productive systems, and the ways in which regional resource endowments shape specialization, though only GE pays much attention to cost competitiveness (Figure 1). Cumulative causation and endogenous growth ideas entail analysis of the ways in which regional evolutions transform these endowments. EG (but not GE) pays significant attention to enterprise and regional institutional and governance structures, although it rarely considers national and international scale structures. These approaches therefore examine the ways in which trade, in the case of GE, and growth are not simply a result but also a cause of conditions of production and exchange and recognize the significance of local governance. These developments amount to a significant step forward. What is missing however is sufficient attention to (1) the interaction of money wage and other costs and exchange rates in driving competitiveness and economic adjustment on the one hand, and (2) a concern with international and regional payments issues and of impacts on income, expenditure and demand, considered in some research in regional economics and Keynesian demand-side approaches to trade (Kaldor, 1970).

The rest of this paper deals with two insufficiently examined aspects of this framework. In Section 4 regional enterprises and input-output relationships are situated into a wider system of accounts for regional economies emphasizing the importance of the relationship between studies of economic evolution and urban and regional dynamics including the trajectories of export-oriented industries and the capacity of industries serving local markets to compete with imports. To explain the impact of extra-regional competition Section 5 demonstrates the significance of exchange rates and
monetary adjustment mechanisms for the principle of comparative advantage. The conclusion connects these ideas with the principle of cumulative causation and considers the implications of these theoretical arguments for contemporary economic geography.

4 Systems of accounts and urban and regional economies
A regional approach to economic geography rests on a conception of the world as a constellation of national/regional institutional configurations and interests with different resource endowments and different degrees of autonomy that shape economic trends (Figure 3). Movements of capital, people and goods and services lead to the creation of global, trans-national and inter-regional organizations, chains and networks. Trade along with international investments and movements of people and goods are some of the (asymmetric) ways in which varying national models of development are integrated with one another, as are the financial flows with which they are associated. These asymmetries reflect the ever changing hierarchical relationships between nation states and economic blocs. Integration, interaction and interdependence modify the internal structure and dynamics of national and sub-national configurations and generate international/global disequilibria. In some cases economic integration is accompanied by closer political integration and a decline in national autonomy. The division of the world into national and regional institutional configurations remains however a fundamental foundation of the international and national economic order.

A comprehensive analysis of trade, growth and development must examine the underlying multi-scalar geography, institutional conditions and social relations of this global order. EG and GE have made significant contributions to this area of study, as has much research that is more general in character.

The starting point of this paper is however different, resting on the idea that a regional economy can be represented by sets of economic accounts recording flows of income and a corresponding set of capital accounts. Figure 4 indicates the scope of a complete set of income accounts. All of the entries in this table are expressed in money terms. This approach is both limited and advantageous. It is limited in that the relationship between values and material things is not examined. It is advantageous in that difficulties associated with the physical measurement of heterogeneous capital goods are avoided. Every industry is given a production account. The information on inter-industry transactions indicates the structure of production within an economy from the point of view of the dependence of any industry on other industries either as a supplier of inputs or as a purchaser of outputs. Over time these industries co-evolve as do the relationships among them. These production linkages are studies in GE and EG. Table 4 also includes three other accounts that are much less studied: an appropriation account (recording income and expenditures), an accumulation account (recording saving, net lending, investment, acquisition and disposal of financial and non-financial assets and liabilities) and an external account (recording transactions with other regions). The totals (gross output, income, gross savings and investment and exports and imports) are defined on the assumption that the accounts are consolidated (meaning that the items on the principal diagonal are set equal to zero).
5 Specialisation and the international division of labour: the principle of comparative costs reinterpreted

In this world of relatively independent political and economic jurisdictions, national specialization, the international division of labour and international trade were traditionally seen as driven by comparative advantage (Ricardo, 1817). In the 1920s and 1930s this approach was modified in that comparative costs were seen as reflecting the underlying geography, production factors or resource endowments (Heckscher, 1919; Ohlin, 1933). According to the Heckscher-Ohlin theorem, a capital-abundant country exports capital-intensive goods to labour-abundant countries, while importing labour-intensive commodities in return. Assuming that the production factors (labour and capital) are mobile within countries but immobile between them, Samuelson’s (1949) factor price equalization theorem predicts that in a perfectly competitive world the prices of all factors along with those of traded goods will converge. Trade was finally seen as something from which everyone gains. Of these arguments the claim that trade is driven by comparative advantage is widely although not universally accepted. The other two claims are contested, while the neoclassical trade theory prediction of regional income convergence has not materialized (see Durlauf et al., 2005; Sheppard, 2012).

As trade also occurred between similarly endowed countries in goods produced with similar factor intensities, new theories were developed. Krugman (1979; 1991) attributed international trade between similar countries and the geographical concentration of wealth to economies of scale and consumer preferences for diverse goods and services, and also identified the potential significance of the size of the domestic market (a demand-side factor). In growth theory Romer (1986) and Lucas (1988) incorporated increasing returns to capital arising from the accumulation of knowledge into
new (endogenous) growth models, and showed that learning by doing, education and human capital formation could explain the polarization of income associated with the relatively faster growth of developed countries (Romer, 1994). GA added a further step examining the ways in which resource endowments are created as a result of the creation of economic landscapes.

These models have a number of implications. First, there is a feedback from trade and growth to the evolution of factor endowments making the development of industrial activities and industrial areas path dependent and cumulative as was clearly anticipated in earlier studies of cumulative causation (Myrdal, 1956) and in dynamic versions of trade theory such as the Asian flying geese paradigm (Akamatsu, 1962). Second, increasing returns and network externalities give rise to monopolistic competition and oligopolistic markets (Dixit and Stiglitz, 1977). Third, increasing returns open the way to a case for strategic industrial policies (see Amsden, 1985; 1989).

These models rest however upon a number of unrealistic assumptions (Sheppard, 2012) and in many cases rely on an aggregate production function linking quantities of heterogeneous production factors measured in physical terms with rewards to factors of production. As Steedman (1979) showed however the complications that arise for neoclassical trade theory due to the reswitching problem can be avoided by comparing prices of production. It is precisely for this reason that the starting point of this paper is an expression of a regional economic structure in money value terms.

Models and explanations that draw on the idea of comparative or competitive advantage usually pay no attention to monetary mechanisms. At present the values of most goods and services and the conditions governing the reproduction of the wage earning class are formed at a national level sometimes in the light of international comparisons. National structures and processes of regulation are characterized by varying degrees of long-term autonomy. National (and regional) differences in the development of the wage-earning class, the process of wage determination and the conditions of production and exchange are constantly recreated.

As a result of these varying systems of regulation and national histories of investment, national (and regional) systems of production differ. As a result comparative costs also differ. These costs are expressed in money terms in a national currency. As wages are an important driver of costs, and as we want to identify their effects, we shall suppose that money costs can be expressed as the number of hours of labour that they command, and we shall suppose, as did Ricardo, that the costs of production in two countries are the ones set out in Table 1. More specifically, these costs are interpreted as quantities of direct and indirect labour commanded by the wage weighted by a rate of profit/mark-up which itself will reflect the difficulty of producing wage goods in the country concerned. These costs include all logistic costs (including exchange rates, tariffs and so on) associated with the delivery of goods and services to intermediate and final purchasers. In this situation multiplying them by the money wage yields prices of production.

Algebraically suppose that \( a_{ij} \) is the quantity (in value terms) of good \( i \) normally required to produce one unit of good \( j \), and that \( A \) is the corresponding matrix of input-output coefficients where \( A \) is (1) non-negative and indecomposable and (2) non-singular. If \( I \) is the vector of quantities in money terms of abstract labour commanded newly added to units of these goods in the period of reproduction, \( r \) is the general rate of profit, \( w \) is the wage share of value added (real social wage cost or wage cost per unit of value produced), the vector of prices of production is given by (see Lipietz, 1982:76-8):
These comparative costs and prices of production therefore summarize the impacts of a wide range of underlying drivers including wages, capital costs, profit rates, value added, input-output relationships, logistic costs, innovations and a whole range of government policies. No assumptions are made about an equilibrium of any kind. The costs and prices are merely the ones that prevail at a given point in time and will evolve over the course of time.

Table 1. The Ricardian Tableau for England and Portugal (in hours of work commanded per yard of cloth or gallon of wine).

<table>
<thead>
<tr>
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<th>England</th>
<th>Portugal</th>
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<tbody>
<tr>
<td>Cloth</td>
<td>100 hours</td>
<td>90 hours</td>
</tr>
<tr>
<td>Wine</td>
<td>120 hours</td>
<td>80 hours</td>
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</table>

Source: Ricardo (1817).

To simplify consider two industries. In the situation depicted in Table 1 Portuguese producers can produce both wine and cloth more cheaply than their English counterparts: the Portuguese have an absolute advantage in the production of both commodities. But in Portugal wine is comparatively cheap, as \( \frac{c_{WP}}{c_{EP}} = \frac{80}{90} < \frac{c_{WE}}{c_{EE}} = \frac{120}{100} \) whereas in England cloth is comparatively cheap. Alternatively Portuguese producers have a comparatively greater advantage over their English counterparts in the production of wine, as \( \frac{c_{WP}}{c_{EP}} = \frac{80}{120} < \frac{c_{CP}}{c_{CE}} = \frac{90}{100} \), whereas English producers have a comparatively smaller disadvantage in the production of cloth.

The value of commodities bought and sold on the international market is not formed in the same way as values on the national market. In Ricardo’s example where the terms of trade were assumed to be 100:100 England ends up exchanging the produce of 100 hours of work for that of 80 hours. Two points should be made. First Emmanuel (1972) argued that terms of trade and unequal exchange work instead in favour of rich countries and not, as in this case, against them. Second, for Ricardo this inequality of exchange occurs largely because of the international immobility of capital.

International values are formed as a result of the establishment of a rate of exchange that establishes a correspondence between the price systems of relatively autonomous national economies. International exchange can only be sustained if prices expressed in a common currency lie within certain limits permitting a comparative advantage to be expressed as an absolute advantage, and the international monetary constraint is respected. This constraint requires that, in the absence of net overseas earnings and net international credit, exports should equal imports: in recent years there was a polarisation of surpluses and deficits financed by international capital flows.
and increased indebtedness of deficit countries. Suppose that \( p^w \) and \( p^c \) are the international prices of wine and cloth, and \( w^p \) and \( w^e \) are the money wages in Portugal and England respectively, with all quantities being expressed in a common currency. International exchange will only occur if

\[
\frac{c_{w^p}}{c_{w^e}} < \frac{p^w}{p^c} < \frac{c_{w^e}}{c_{w^p}},
\]

with \( p^w = c_{w^p} w^p \) and \( p^c = c_{w^e} w^e \). In other words it will only occur if the ratio of money wages expressed in a common currency satisfies the constraint

\[
\frac{c_{w^e}}{c_{w^p}} = \frac{100}{90} < \frac{w^p}{w^e} < \frac{c_{w^p}}{c_{w^e}} = \frac{120}{3/80}.
\]

Suppose that the rate of exchange is equal to 1 unit (escudo) of the Portuguese currency per unit (£) of the English currency, or \( e = 1 \). Suppose also that the money wage in each country is £0.01. If the price of cloth in England is £1 the average price of cloth in Portugal expressed in units of the English currency is £\( \frac{90}{100} = £0.90 \). Similarly the prices of wine are £1.20 and £0.80 respectively (see the opening tableaus in Tables 2).

In these circumstances the Portuguese economy has an advantage not only in the production of wine but also in the production of cloth. If trade were to occur the English economy would have a large trade deficit and the Portuguese economy a large surplus. What is required is a mechanism which will raise the international prices of all Portuguese products and lower the international prices of all English products until (1) English producers can undersell the Portuguese in one of the two commodities, and England’s comparative advantage has been translated into a competitive/absolute advantage, (2) resources have been transferred to the activities in which each country has a comparative advantage, and (3) the values of each country’s exports and imports have been altered and the balance of payments of the two countries brought into equilibrium. In the absence of these adjustments protectionism, exchange controls and capital transfers would be the only way of avoiding international trade conflicts and national economic crises. In reality imbalances of this kind do occur: as we have already indicated since 2000 the United States drew on large capital transfers from the rest of the world to finance a vast and increasing trade surplus with China. In the long-run large deficits are unsustainable. In the short-run they can generate strong pressures for exchange rate adjustment, yet they can have enduring effects on national specialization by setting in motion cumulative processes.

Adjustment can occur in a number of ways. In the first place wages in Portugal could rise, pushing up prices, while those in England fell, until \( w^p = 1.11w^e \), and the prices of cloth expressed in the English currency were equal. As is indicated in Table 2, the desired result could be achieved by a 5.26 per cent fall in English prices and an equivalent rise in Portuguese prices. In these circumstances England would be able to export cloth and to earn foreign currency with which it could pay for imports of wine.

Table 2 International prices with fixed exchange rates and wage flexibility where \( w^p = w^e \), \( w^p = 1.11w^e \) and \( w^p = 1.5w^e \).

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<tbody>
<tr>
<td>Cloth</td>
<td>£1.00</td>
<td>£0.90</td>
<td>£0.95</td>
<td>£0.95</td>
<td>£0.80</td>
<td>£1.08</td>
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The prices in the middle section of Table 2 are the lower limit at which the balance of payments of the two trading countries can be equilibrated. The upper limit occurs at the point at which the prices of wine expressed in the English currency are equal as a result of a fall in relative English wages.

A second way in which adjustment could occur and the international flows of money corresponding to international commodity exchange could be equalised is through movements in the rate of exchange. Starting from the same initial position the rate of exchange would have to move in favour of the Portuguese until it reached at least 1 escudo=£1.11 (e = 1.11) and the prices of cloth were equalised. An upper limit to the depreciation of the pound also exists where the rate of exchange of 1 escudo=£1.50 (e = 1.50) and the prices of English and Portuguese wine would be equal (see Table 3).

Table 3 International prices with flexible exchange rates and wage inflexibility with \( e = 1.00, e = 1.11 \) and \( e = 1.5 \)

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<th>England</th>
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</thead>
<tbody>
<tr>
<td>Cloth</td>
<td>£1.00</td>
<td>£0.90</td>
<td>£1.00</td>
<td>£1.00</td>
<td>£1.00</td>
<td>£1.35</td>
</tr>
<tr>
<td>Wine</td>
<td>£1.20</td>
<td>£0.80</td>
<td>£1.20</td>
<td>£0.89</td>
<td>£1.20</td>
<td>£1.20</td>
</tr>
</tbody>
</table>

A comparative advantage must therefore be translated into an absolute advantage. It can occur if there are separate currencies, or if regional wage variations can emerge. Adjustment can also occur as a result of factor mobility with increased investment and employment in the area with lower comparative costs (assuming that costs are constant). A third possibility is for surplus areas to transfer financial resources to deficit areas to permit them to consume more than they produce.

This analysis highlights some of the dilemmas of the Eurozone where Germany’s high productivity and declining real wages have generated massive surpluses with peripheral Member States which, in a single monetary space, could no longer resort to devaluation. In recent years these deficits were financed by capital loans that these countries can no longer afford to re-pay. If the Eurozone were also a fiscal union, fiscal transfers might serve as a suitable adjustment mechanism as is the case in most single currency zones. In the EU however the EU budget account for just 1% of GDP, and transfers are limited, as is population mobility, while the adoption of a single currency closed off the exchange rate flexibility option. In this case adjustment will have to fall on wages as demanded by European institutions, although this option is profoundly deflationary and generates strong resistance as it drives down the living standards of the wage earning class.

The existence or otherwise of gains from trade is a separate matter: it depends on assumptions of constant returns to scale in all production processes, full employment, markets that are flexible and costs of adjustment that are zero. In the presence of diminishing or increasing returns, costs would be affected by changes in the level of output, while the existence of unemployed resources would mean that the opportunity cost of producing the imported good domestically is zero, except as and in so far as production could only occur if materials and capital goods were imported. Ricardo’s
example is very deceptive. At that time England had a competitive advantage in manufacturing, and manufacturing was subject to strong increasing returns: free trade was imposed on Portugal, enabling Britain’s industries to grow more quickly and drive down costs, while Portugal stagnated and was made into a deficit country (Sideri, 1970).

Movements in relative money wages or in the rate of exchange, caused by changes in the process of money income formation and the operation of an international monetary constraint, always occur in conjunction with changes in specialisation. Each economy is normally capable of producing a range of commodities, and the constraint on the money wage ratio should be written \( \frac{\text{ships}_E}{\text{ships}_P} < \frac{\text{iron}_E}{\text{iron}_P} < \frac{\text{cloth}_E}{\text{cloth}_P} < \frac{w^E}{w^P} < \frac{\text{wine}_E}{\text{wine}_P} < \cdots < \frac{oil}_E{oil}_P \). In other words, for a given money wage ratio and rate of exchange there exists an international division of social production with England exporting a quantity of each of the internationally traded goods to the left of \( \frac{w^P}{w^E} \), represented by a vector \( x^E \), in exchange for imports from Portugal of the other goods, represented by a vector \( x^P \).

The same industry can appear on both sides of the inequality. In this case intra-industry trade takes place with a particular pair of countries importing and exporting different varieties of the same good. In addition the processes of production of many goods are segmented and spread over national and international networks of production sites, with intermediate and semi-finished goods transferred from one place to another for further processing. In this case exports embody the skills and technologies incorporated in imported inputs. These subdivided processes of production often reflect specialisation in different production stages of a final good or service and in different functional roles, with different capital, knowledge and skill intensities. In this case impacts on income depend on variations in net value added and trade associated with occupational specialisation. In every industry there is a variety of functional and occupational roles: research and development, product design and engineering, manufacture, marketing, sales, inbound and outbound logistics and administration. The specialisation of different places in different functions and occupations within industries is another driver of trade and differential development and is again in part a result of comparative costs. The method of theoretical analysis outlined in this section is in other words applicable to a wide range of situations as long as activities are allocated to different places according to comparative costs.

Suppose next that England has a trade deficit, so that the international monetary constraint is not respected. In other words \( p^P x^P > p^E x^E \), where \( p^P \) and \( p^E \) are vectors denoting the prices of production in Portugal and England respectively. To reduce this deficit in the short-term, wages, the exchange rate, or both must fall in England and rise in Portugal. (In the medium term England could increase relative productivity). The wage ratio expressed in a common currency which links the two national price systems would accordingly be altered moving to the right through the ranked array of comparative costs. As a result the schema of specialisation should change with commodities that were formerly exported by the Portuguese now being exported by the English. Cases of his kind are not rare indicating that trade adjustment can drive long-term changes in specialization.

This analysis must be qualified in several ways. First, any reduction in capacity and development of new spheres of activity involve a scrapping of existing equipment, investment in new activities, and a redeployment of workers. As a result shifts in specialisation are neither smooth nor automatic. What is more only if an industrial system is highly diversified, integrated and resilient can exports be
increased and imports diminished without very large variations in the wage ratio or in the exchange rate, and only if a country is capable of remodelling its industrial system and is not dependent on narrow market niches can shifts in specialisation occur without serious dislocation. As already indicated, EG provides many concepts for examining these evolutions. What is absent is adequate attention to the causal mechanisms considered in this analysis.

Another difficulty concerns the effects and efficiency of monetary mechanisms. Ricardo held that the mechanism through which adjustment would occur was the one posited in the classical quantity theory of money (see Shaikh, 1979:281-302 and 1980:27-57). On this account net transfers of gold, at first from England to Portugal, would be translated into movements in money price levels in the two nations (relative prices were deemed to be determined by real factors, and money was only introduced in order to determine the general price level). Whether or not monetary expansion and contraction have a direct effect on the price level has been a subject of dispute in economics. According to Marx and Keynes, for example, changes in the supply of money have a direct effect only on the rate of interest: a fall in the supply of money results in an increase in the rate of interest raising, incidentally, the costs of borrowing and impeding the new investment necessary for adjustment, and vice-versa.

In monopolistic circumstances wages and other costs are characterised by a degree of inflexibility. Confronted, say, with a fall in the exchange rate employers may decide against a downward adjustment in prices expressed in a foreign currency. In this case the competitiveness of the enterprise’s output would remain the same, and its profit margins on export markets would increase. Adjustment in this case may well fall on output instead of on prices. Adjustment is neither automatic, nor self-equilibrating at full-employment levels of resource use (see Edwards, 1985:123-37).

In this section we have in short identified a number of vital mechanisms of international and regional adjustment: exchange rates, wage rates and international monetary constraints that will bind in the absence of capital movements. In addition a method of theoretical analysis was used in order to identify and describe the interaction of some of the major drivers (summarised in Figure 3) of the evolution of the rate of exchange and of the international division of labour depend. The historical process itself can however only be explained if this theory is elaborated further and is supplemented by empirical analysis.

This argument can be developed in a variety of ways. In particular it can be extended to include a macroeconomic account of the dynamic interaction of the schema of specialisation represented by the vectors $x^E$, $x^P$ and the conditions $A$, $l$, $w$ and $r$, and of what Myrdal and Kaldor first called processes of circular and cumulative causation (see Myrdal, 1957:11-22 and Kaldor, 1970:340-4 and 1972:1244-5). Models of circular and cumulative causation along with an analysis of the underlying mechanisms of value formation are core elements explanations of uneven development: while the raw material and land-based activities depend on natural resource endowments, processing activities depend on resource endowments and markets that are endogenous results of development. These models highlight the importance of other drivers of regional growth: evolution of demand from the export sector and residential economy, investment and movements of factors of production. Kaldor showed that the demand for an area’s exports plays an especially important role in inducing new investment (raising output and perhaps employment), which in processing sectors is associated with increasing returns that drive up productivity and reduce efficiency wages.
Exports in turn depend on the growth in demand for a region’s products, and on the efficiency wage relative to other areas, generating potentially virtuous and vicious spirals.\(^6\)

The mechanisms highlighted in this model are concerned only with the movement of economic aggregates and with very broad sectors of activity identified in standard national and regional social accounts. Yet transactions within sectors and especially within the industrial sector/account are particularly important.

**A new geography of trade and regional development**

In this paper we have emphasized the continuing importance of models and concepts developed in regional economics and earlier geographical traditions, and the need for a synthesis of these ideas with analyses of institutionally shaped and mediated resource endowments and productive systems. In Section 3 we emphasized the role in regional economic evolution not just of the production account but also of the appropriation, accumulation and external accounts. In a world of increased international trade and competition, analysis of the external account and its drivers are particularly important embracing a regional economy’s and its component enterprises’ competitive advantage including their capacity to export and compete with imports from other currency zones.

In section 2 we presented a conceptual framework that embraced trade-related wage and exchange rate adjustment and capital flows, and in section 3 we presented a reformulation of the principle of comparative advantage. Amongst other things, the aim of these sections was to emphasise the importance for economic geography of economic calculation and analytical reasoning. Economic calculation and analytical ideas are important features of classical and neoclassical location theories. Consideration of institutional and sociological contexts, rules and drivers add rich new insights. These approaches should however add new dimensions of analysis rather than replace economic calculation.

Analytically, the starting point was the advance of money, incomes and demand. Money and credit initiate and drive economic activity: decisions to advance credit and money wages and to acquire working and fixed capital create income, while income is a source of effective demand, and drives capital accumulation and growth. Once produced, goods and services are offered for sale in the market place at prices of production. The determinants of these prices are complex and are not confined to economic considerations: relative power and strategic choice play a role. If these goods and services are sold, income is earned, and, if prices are high enough, costs are recovered. These revenues provide capital incomes and money capital that can re-start a circuit whose size and character can change over time as enterprises seek to innovate and grow and to compete with their domestic and international rivals. In short capital expenditure, credit and investment subsidies (accumulation account) and the creation of markets (production and income accounts) are crucial drivers of industrial dynamics. What happens in the long run is a result of a succession of decisions with varying time horizons. These decisions are made in the light of current conditions and expectations about how they will evolve. Their effects however are cumulative, and in some cases the decisions made are profound and radical. As a result these decisions can have enduring effects on the evolution of economic landscapes.

At any point in time the activities in a particular area are associated with a structure of specialization and a set of comparative costs/prices. Competitive success depends on the establishment of an
absolute advantage. If areas have different wages and/or different currencies what initially are only comparative advantages can be translated into absolute advantages. Other adjustment mechanisms do exist: included are the mobility of capital and labour, and money transfers or loans that permit areas that are relatively uncompetitive to import more than they export. Fiscal transfers are particularly important within national economies, and in many single currency zones though not in the EURO zone. In the short-term deficits can be financed by international credit, although credit is often awarded conditionally, and rivals who accumulate large Sovereign Wealth Funds also increase their capacity to acquire assets and resources. In the absence of sustained transfers, a monetary constraint will ultimately come into effect.

The polarization of surpluses and deficits (Figure 1) is a result of shifts in relative competitiveness between different monetary spaces and the weakness of the inter-area monetary constraint (the developed countries with deficits and the emerging manufacturing economies and oil producing countries with surpluses) and between different parts of a single economic space (German surpluses and the deficits of peripheral European countries that relied for so long on falling exchange rates to keep deficits in check and whose recourse to credit provoked a debt crisis). These outcomes have had a profound set of effects on comparative regional dynamics whether through the impact of deleverage and recession on growth, or the impact of rising wage costs and rising exchange rates in emerging economies that see significant intra- and inter-national industrial transfers and in some cases permit the return of activities formerly offshored from high income countries.

Adjustment mechanisms in the shape of currency exchange rates and capital mobility are crucial for the understanding of relationships between international trade, regional resources and assets, the long-term competitiveness of industries and regional development. The geographical evolution of markets and underlying trends in income and credit play major roles in the growth, contraction and relative development of regional economies shaping the regionally embedded and path-dependent processes examined in relational and evolutionary EG.

As indicated in Section 2, the importance of major monetary mechanisms, especially money wage costs, exchange rates and currency and capital flows, in shaping industrial competitiveness and specialization is clearly illustrated by the impact of EURO zone imbalances, the Asian financial crisis and the appreciation of Japanese Yen (especially against the USD) after the Plaza Accord. In the latter case, in 1985, the G5 (US, UK, France, West Germany and Japan) agreed on co-ordinated currency market action to depreciate the US dollar relative to the Japanese Yen and German Deutsche Mark (Figure 2). The aim was to assist US recovery from the early 1980s’ recession, and reduce current account deficits. As a result in 1985 to 1987 the US dollar depreciated by 51 per cent against the Yen (Figure 2; Funabashi, 1988). The appreciation of the Yen depressed Japan’s export-oriented manufacturing industries and opened the way to a series of expansionary monetary policies. These policies contributed to Japan’s late 1980s asset price bubble (Destler and Henning, 1989) and the 1990s’s recession (the so-called Lost Decade), partly because of a liquidity trap that rendered these policies ineffective in stimulating economic growth when interest rates were very low (see Krugman, 2009). In this case changes in real effective exchange rates and subsequent impacts on capital flows and real wage costs interacted with (local) factor endowments and formal and informal institutions to modify the long-term competitiveness and structure of Japanese industries.
The mechanisms involved in the creation of resource endowments and the determination of efficiency wages, values and flows of money and capital are steps that are not considered in any detail in this paper. EG and GA deal with the first of these steps. GE does deal with costs and profits but does not adequately deal with real and monetary adjustment mechanisms in a disequilibrium framework or with the monetary outcomes and imbalances associated with changes in trade surplus and deficits, movements in exchange rates, capital flows and associated changes in income. What is involved is examination of the reciprocal relationships between micro-conduct and the overall performance of regional economies: real and monetary adjustment mechanisms drive in important ways the capacities and capabilities of regional economies, and movements up or down the value-chain are a response not just to supply-side but also to demand-side, monetary and payments-related factors.

References


Andresen, MA (201) Geographies of international trade: theory, borders and regions. Geography Compass, 4:94-105


If every industry is given a production account, and the appropriation, accumulation, and external accounts of a region are consolidated, the column for each industry includes the value of its inputs divided between intermediate, or produced, inputs, represented by elements of the matrix, \( O \), and the total value of factor, or non-produced, inputs, represented by elements of the vector \( y \) (which must include depreciation). In the row for each industry is recorded the value of its sales divided into sales of intermediate products to other industries and sales of final products on domestic and international markets. The main model associated with this display of accounts is the input-output model. It can be thought of as a means of calculating all the intermediate product flows required to support a given set of outputs of final goods. Once these outputs are known, the outputs and levels of income generated in the various industries can be calculated. The model is \( O = A\hat{q} \) where \( A \) is a matrix of coefficients, \( a_{ij} \), denoting the quantity of good \( i \) required to produce one unit of good \( j \), such that \( A' i < i \) where \( i \) is a column vector the elements of which are units, and where \( \hat{q} \) is a diagonal matrix whose diagonal elements are the elements of the vector \( q \) of outputs of final goods. The solution of the model is:

\[
q = Zi + f = Aq + f = (I - A)^{-1}f
\]

The inverse \((I - A)^{-1}\) a sufficient condition for whose existence is that \( A' i < i \) is known as the matrix multiplier. The solution for income, \( y \), can be found by multiplying the elements of the vector \( q \) by the proportions which factor incomes bear to total output in each industry, or by the complements of the proportions represented by total intermediate inputs. The input-output part of this system of accounts has been widely used in regional economics, and has indeed been extended to create multi-regional models that explore the transactions within and between regions. Interregional linkages have important implications for the effects of an expansion of demand on a regional economy. Suppose that two regions have the following matrix multipliers:

\[
(I - A^E)^{-1} = \begin{bmatrix}
1.0 & 0.3 \\
0.3 & 0.4
\end{bmatrix}
\]

\[
(I - A^P)^{-1} = \begin{bmatrix}
1.9 & 0.7 \\
0.7 & 1.8
\end{bmatrix}
\]

Suppose also that the demand for the products of industry 1 in region 1 increases by £100 million. The multiplier attached to industry 1 in region 1 is equal to the sum of the column elements, or 1.3, so that output in region 1 expands by \((1.3)(£100 \text{ million}) = £130 \text{ million}\). Assume, however, that industry 1 in region 1 always buys 50 per cent of its inputs from activity 1 in region 2. In these conditions the demand for region 2’s exports increases by £50 million. As the multiplier for activity 1 in region 2 is 2.6, output in region 2 will expand by \((2.6)(£50 \text{ million}) = £130 \text{ million}\). Additional feedbacks are likely to occur from region 2 to region 1, while a complete interregional input-output table would be more useful than tables for closed regions and import coefficients (see also Thirlwall, 1974:5-10).

A scientific theory as opposed to an axiomatic theory is one in which the truth content or justification of its propositions depend on their correspondence with sense experience/empirical phenomena. If empirical observations are not consistent with the propositions, the initial hypotheses should be repudiated. In social science however the initial assumptions as well as any propositions derived from them should also be subject...
to empirical validation not in the sense that some considerations can be at least initially set aside (to simplify the analysis) but in the sense that careful attention should also be paid to the validity of assumptions/approximations.

3 The inverses of total costs can be interpreted as indices of the productivity of labour employed to produce one unit of each type of commodity in the conditions of production prevailing in each country. It follows that each economy has a tendency to export those goods where its productivity relative to that of its competitors is greater than the ratio of money wages expressed in a common currency.

4 A reader indicated that a similar point about exchange and wage rates was made in a paper by Samuelson (1964). The essence of the argument is indeed similar, yet its implications were subsequently overlooked.

5 Whether gains from trade occur depends on assumptions of constant returns to scale in all production processes and full employment. In the presence of diminishing or increasing returns, costs would be affected by changes in the level of output, while the existence of unemployed resources would mean that the opportunity cost of producing the imported good domestically is zero, except as and in so far as production could only occur if materials and capital goods were imported. In addition inflexibility in factor markets must be ruled out along with the existence of costs of adjustment.

6 A formal representation of this model (Dixon and Thirlwall, 1975) is as follows:

\[
\begin{align*}
\dot{r}_t &= \dot{r}_a + \lambda \left( \dot{q}_t \right) \\
\dot{p}_d &= \dot{w}_t + \dot{\tau}_t - \dot{r}_t \\
\dot{e}_t &= \eta \left( \dot{p}_d^* \right) + \varepsilon \left( \dot{q}_t^* \right) + \delta \left( \dot{p}_d^* \right) \\
\dot{q}_t &= \gamma \left( \dot{e}_t \right)
\end{align*}
\]

where \( \dot{r} \) = rate of productivity growth, \( \dot{r}_a \) = rate of autonomous productivity growth, \( \lambda \) = Verdoorn coefficient, \( \dot{q} \) = rate of productivity growth, \( \dot{p}_d \) = rate of domestic inflation, \( \dot{w} \) = rate of growth of money wages, \( \dot{\tau} \) = rate of growth of \( 1 + \chi \) per cent mark-up on unit labour costs, \( \dot{e} \) = rate of growth of exports, \( \eta \) = price elasticity of demand for exports, \( \varepsilon \) = income elasticity of demand for exports, \( \gamma \) = rate of growth of world income, \( \delta \) = cross-elasticity of demand for exports, \( \dot{p}_f \) = rate of growth of world prices and \( \gamma \) = a constant.