Journal of Economic Perspectives—Volume 24, Number 4—Fall 2010—Pages 207–217

Retrospectives
An Early Supply-Side–Demand-Side Controversy: Petty, Law, Cantillon

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This feature addresses the history of economic terms and ideas. The hope is to deepen the workaday dialogue of economists, while perhaps also casting new light on ongoing questions. If you have suggestions for future topics or authors, please contact Joseph Persky, Professor of Economics, University of Illinois, Chicago, at ⟨jpersky@uic.edu⟩.

Introduction

Early modern Europe in the late seventeenth and early eighteenth centuries witnessed an unprecedented increase in the rate of economic growth, and governments entertained a wide range of proposals aimed at developing and harnessing foreign trade and emerging financial markets. In his magisterial survey of foreign trade doctrine, Viner (1936 [1965], p. 52) pointed out that enlightened authors of that time were often nonbullionist mercantilists: they favored export promotion and import reduction not on the grounds that it would lead to an accumulation of gold, but on the grounds that it would increase trade and employment. My focus here is on how some key economists of this time period adumbrated disputes between supply-side and demand-side macroeconomics that have continued to the present day.

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doi=10.1257/jep.24.4.207

At first sight, the writings of William Petty, John Law, and Richard Cantillon may not appear closely connected. However, both Petty and Law emphasized the potential for government fiscal and monetary actions to influence the "state of trade"—by which they meant employment and economic activity. They argued for government policies to mobilize and activate unutilized resources. While Cantillon avoids naming names in his *Essay on the Nature of Commerce in General*, he clearly and explicitly criticizes the writings of both Petty and Law. Cantillon thought that output and employment (even in early eighteenth-century economic conditions) were bound by supply-side constraints such that the fiscal and monetary policies advocated by Petty and Law would divert resources from alternative uses, generate inflation, and adversely affect the balance of payments.

The links are by no means only theoretical. Petty played a meaningful role in the events that cost Cantillon's grandparents and great-grandparents their large land-holdings in Ireland. John Law's experiment in government finance allowed Cantillon to make one fortune by investing in the "Mississippi bubble" as it inflated, and another fortune by selling short before it deflated. The litigation, acrimony, and thuggishness that accompanied the settling of Cantillon's short-selling probably led to his murder (or what some believe was a carefully crafted disappearance) amid the flames of his London townhouse.

William Petty on Stimulating Irish Employment

William Petty (1623–1687) was born into a clothier's family in Romsey on the south coast of England. At 15, he went to sea to trade, but was soon studying at a Jesuit college in France after his near-sightedness caused the ship to run aground. He returned briefly to England, but the onset of the Civil War (1643) saw him living abroad, first in Utrecht, then Leiden, Amsterdam, and Paris. A string of luminaries (including Thomas Hobbes) introduced him to the latest developments in algebra and anatomy. After returning, he became Professor of Anatomy at Brasenose College, Oxford, in 1651.[1] In 1652, he took up a post as Surgeon General to Oliver Cromwell's army invading Ireland. At the end of the conflict, Petty successfully bid for the contract to survey the island. Hiring over 1,000 surveyors he produced what came to be known as the "Down" survey in only 13 months, which was then used to give grants of Irish land to Cromwell's army and those who had financed it. For his part, Petty received immense landholdings, allowing him to establish a Protestant colony at Kenmare, on the southwest coast of Ireland, with a successful

[1] Around this time, Petty joined the influential group of experimentalists associated with Robert Boyle and Samuel Hartlib, which later evolved into the Royal Society of London. Hartlib and his circle were in the process of abandoning their hopes for alchemy and embracing the establishment of "land banks" as a means of providing money (Wennerlind, 2003; Horsefield, 1960). As a side note, Petty was knighted at the incorporation of the Royal Society in 1662.

smelting facility. His landholdings also embroiled him in years of legal purgatory and charges of corruption as the political tides changed.

Petty left behind three major works: *A Treatise on Taxes and Contributions*, published in 1662, and *Political Arithmetick* and *The Political Anatomy of Ireland*, both of which were written in the late 1670s but only published after his death, in 1690 and 1691, respectively. Two themes recur in Petty's characterization of the contemporary economic conditions of Ireland: the existence of underemployed resources and the possibilities for government intervention to spur demand-led growth. Petty's demographic analysis imparted considerable urgency to his view of the employment problem. He famously found that population grows at a constant rate. Jobs needed to match that rate of growth. While land and natural resources would eventually halt population growth, he calculated that this constraint lay three centuries away (Petty, 1683, p. 17). Demand was critical and Petty's most famous proposition in regard to "supernumeraries" or the unemployed occurs in the *Treatise on Taxes* (1662, p. 13): "Now as to the work of these supernumeraries, let it be without expense of Foreign Commodities, and then 'tis no matter if it be employed to build a useless Pyramid upon Salisbury Plain, bring the Stone at Stonehenge to Tower Hill, or the like." The *Treatise* hypothetically posits that 10 percent of the workforce is unemployed while his *Political Arithmetick* calculates what we now call the GDP gap—two million pounds sterling would be added to national income were labor fully employed (1690, p. 307).

Petty's efforts to stimulate Ireland's economy led him to a number of insights. For example, Petty often found himself in conflict with "tax-farmers" who had bought the right to tax Ireland.[2] In the *Treatise*, he provides an innovative calculation of national income and expenditure that supported his argument that taxes should and could be shifted away from the land towards other forms of property, or preferably towards excise taxes. Indeed, Sir Richard Stone (1986, p. 18) regards Petty as the first important "precursor" to national income accounting.[3] Petty's inventive mind produced several supply-side inventions. Best known are his double-bottomed ship (he called his own catamaran "Experiment") and a "double-writing" device that produced a copy while a document was being written. Yet in Petty's writings on commerce, the emphasis clearly lies with government's role in stimulating demand to increase employment and income.

Petty viewed economic stimulus largely in terms of the circulation of money. In keeping with his training as a physician, he felt that too little is enervating, while too much was harmful.[4] Petty advocated establishing a register of land in Ireland that would secure ownership by absentee landlords, encourage inwards investment,

[2] Hull (1899, p.xxvii) also recounts Petty's attempt to bid for (and reform) the tax farm.

[3] Petty's discussion of the tax base led him to "reduce" or express all commodities as quantities of labor, which for Karl Marx (1859 [1970], p. 52) made him the first classical economist.

[4] See Chapter 5 of *Verbum Sapienti*, first published as a supplement to the *Political Anatomy of Ireland* (1691). On the role of medical training in the development of monetary analysis, see Desmedt (2005).

and allow the creation of 4 million pounds of money backed (in an unspecified manner) by land. More money would lower interest rates, but only to a "natural limit" set, in England at least, by the maximum 21 "year's purchase" at which land could be sold—the price of land was no more than 21 times the annual rent it yielded (Petty, 1662, p. 27).[5]

Petty approached fiscal policy from a monetary perspective as well: taxes are too high only when their collection—which draws money out of circulation—causes trade to diminish, while state expenditure adds to the volume of money circulating and stimulates trade in proportion to the velocity of circulation: "[F]or a hundred pound passing a hundred hands for Wages, causes a 10000 l. [10,000 £] worth of Commodities to be produced, which hands would have been idle and useless, had there not been this continual motive to their employment" (1662, p. 18–19).

Exports and imports are often at the center of Petty's attempts to stimulate output. "Supernumeraries," as he called the underemployed, should be put to work by the sovereign without the use of any imported goods and ought to be directed, where possible, towards the construction of roads and riverine improvements that increase exports by lowering transport costs. According to this logic, the initial public works expansion of employment would be followed by an increase in export demand and a balance of payments surplus that would, when money is scarce, have an additional beneficial spending-cum-transactions multiplier effect. Petty notably fails to mention the possibility that better transport facilities might increase British imports or cause a deterioration in the balance of payments. The repeal of laws blocking the export of Irish cattle into England is repeatedly advocated to stimulate the especially underutilized Irish economy. Import substitution is recommended for England (Petty, 1690, p. 309) and Ireland where government officers should seek to shift tastes away from imports. "That the Lord Lieutenant and Council, as also the Nobility, Courts of Justice and Officers of the Army, and other Gentlemen in and about *Dublin*, may by their engagement and example, discountenance the use of some certain Foreign Commodities, to be pitched upon by your Lordships: And that Gentlemen and Freeholders in the Country, at their Assizes, and other Country meetings; and that the Inhabitants of all Corporations, who live in Houses of above two Chimneys in each, may afterwards do the same" (Petty, 1691, p. 128). Tariffs should rest lightly on raw materials and heavily upon finished goods that compete with domestic productions (Petty, 1662, p. 37).

[5] The language Petty uses here is difficult and probably misleading for modern readers: "I pitch the number of years purchase, that any Land is naturally worth, to be the ordinary extent of three such persons their lives. Now in England we esteem three lives equal to one and twenty years . . . But in other Countreys [sic] Lands are worth nearer thirty years purchase, by reason of the better Titles, more people, and perhaps truer opinion of the value and duration of three lives" (Petty, 1662, p.27). By "purchase," Petty (and his contemporaries) meant the rent of land. If we think of this rent as a dividend, then we can call Petty's "21 year's purchase" (that is, rent) a price to dividend ratio of 21, which works out to a return on land ownership of around 4¾ percent.

John Law's Financial Innovations

John Law's (1671–1729) father was a "goldsmith banker" in Edinburgh, as were his two younger brothers. Goldsmith bankers accepted gold deposits and issued receipts that circulated as money. They also made interest-bearing loans. Little is known about Law's youth or grammar school education at Eaglesham, south of Glasgow. By 1694, Law was a well-known figure in London. A habitué of fashionable gambling tables, he had been arrested for dueling and murder. Fortunately for Law, someone important had his cell unlocked, and he escaped to the continent. Amidst wealthy society, Law amassed an impressive gambling performance by offering well-heeled players temptingly large payouts with vanishingly small probabilities. Law's thoughts turned towards the large-stakes financial undertakings in banking, corporate formation, and debt management taking effect across Europe. From 1704 to 1707, Law wrote two important contributions to monetary economics and developed proposals for banks in England, Scotland, and France.

Law's early campaign for financial innovation was directed at his native Scottish audience, for whom he produced an *Essay on a Land Bank*, which was only recently (re)discovered and published by Antoin Murphy (1994). The Scottish money supply certainly exhibited problems. The Scottish Royal Bank had only been established in 1695, and then had been the subject of a worrisome run. The Scottish currency had as yet to be fully integrated with England's, and it suffered as much as any part of Europe from a shortage of small change that episodically froze transactions and economic activity (Sargent and Velde, 2002). *Essay on a Land Bank* presents two alternative mechanisms for issuing paper money. The first mechanism has the land bank purchasing land in exchange for land notes. These notes are to maintain their value, in terms of land, by allowing note holders to exchange notes for *any* parcel of land on the bank's books *at the value the bank paid for that parcel*. The second mechanism has the land bank issuing notes against mortgages. Here notes are exchangeable for any of the bank's mortgages or for its "securities," which are to pay the maximum interest rate allowed by usury legislation.

Law's better-known *Money and Trade Considered* (1705) was hurried off his aunt's press in 1705 in the hope of swaying the Scots Parliament in favor of Law's bank proposal rather than that of one of his competitors (Murphy, 1997, p. 76). As in the *Essay on a Land Bank*, Law seeks to render the money supply more elastic while creating a paper money that holds its value better than metals.

The dramatically new element in *Money and Trade Considered* is the thesis that "money drives trade." Thus, while the then-traditional demand-side methods of economic stimulus such as export subsidies and import restrictions are welcomed, Law maintains that they can only increase employment and output if the money supply is elastic. Moreover, Law emphasizes that money can act as a means of stimulating employment and output, rather than just accommodating external demand stimuli. The transmission mechanism and in particular the first round effects of money creation are not fleshed out in any detail, but this passage captures the

tenor of the discussion (1705, p. 13): "Domestic Trade depends on the Money. A greater Quantity employs more People than a lesser Quantity. . . . no laws can make it go further, nor can more People be set to Work, without more Money to circulate so, as to pay the Wages of a greater number. . . . An Addition to the Money adds to the Value of the Country." Indeed, starting from a position of unemployment and a balance of trade deficit, Law asserts that a sufficiently large increase in the money supply would set off a multiplier process involving greater output, greater exports, an improved balance of trade, and (as a result of trade surpluses) a further (now metallic) increase in the money supply.[6]

Law's exposition of the interest rate contains a weakness that would become central to the financial system he established in France. Observing that the previous centuries witnessed both rising prices and falling (nominal) interest rates, Law concludes that when the interest rate is constant, at apparently any level whatsoever, so is the price level.[7]

Law's proposal for a bank in Turin did not bear fruit, but a series of plans he produced for the French Controller-General of Finances hit the mark in 1714. At that time, France had relatively little gold and a large amount of debt from fighting a series of wars, and its economy was hindered by a lack of coinage. France was willing to give Law's plan for expansion of paper money a try. Law began with a relatively modest private bank that held and issued notes against gold. Law then received permission to open the Banque Générale in 1718. The notes issued by the bank were a claim not against a particular coin, but against the metallic content of the coin. In this way, holders of his notes were insulated against government-mandated changes in the nominal value and/or metallic content of coins. The bank was successful inasmuch as its notes passed at a premium over coinage, and its note issue corresponded with a fall in interest rates in Paris. It was soon nationalized and transformed into the Royal Bank, its notes now rendered legal tender.

In just two years, Law absorbed the mint and the companies collecting indirect taxes and holding monopolies on foreign trade and merged them all into the Company of the West, known also as the Mississippi Company since its initial business was to develop "greater Louisiana," upon which it held a trade monopoly for 25 years. Shares in the Company were issued in exchange for government debt. This interest became a large component of Company income, but competing claims to state revenue, as well as inefficiency in the government's revenue collection, delayed payments and led the Company into the management of the public finances. Indeed

[6] "More Money, by employing more People, will make an Overplus to Export: If then the Goods imported balance the Goods exported, a greater Addition to the Money will employ yet more People, or the same People before employed to more advantage; which by making a greater, or more valuable Export, will make a Balance due" (Law, 1705, p. 14).

[7] Alterations in the supply versus the demand for money are depicted as simultaneously shifting both the price level and the interest rate in chapter 5: "As the Quantity of Money has encreas'd since that time, much more than the Demand for it; . . . so of Consequence Money is of lesser value: A lesser Interest is given for it: A greater Quantity of it is given for the same Quantity of Goods . . ." (Law, 1705, p. 67).

Law aimed to purchase all of the government's outstanding debt and replace it with the equity of this company, in effect attempting a reverse leveraged buyout (Buchan, 1995; Murphy, 1986; Velde, 1999). By the start of 1720, Law held every significant policy lever of the French economy in his hands, having augmented the traditionally powerful role of Finance Minister with leadership not just of his newly created central bank but also of the one great company dominating the equity market.

The profitability of Law's debt-for-equity swap relied upon a high stock price for the company (relative to its dividend) because the company would receive only 3 percent on its loan to the government. To encourage buyers, shares could be paid for over 10 or 20 monthly installments, which gave them aspects of an option (Garber, 1990). The stock price rose from 3,600 livres when the plan was announced to 5,000 livres within a month (Velde, 1999, p. 20) in good measure because the Royal Bank provided loans at low interest rates against shares and also supplied its notes directly to the company so it could support shares at a price of 5,000 livres (fall 1719), and later at 9,000 livres (March 1720). Over that period, the supply of bank notes more than tripled causing exchange rate depreciation as well as inflation—commodity prices rose 25 percent in January 1720 alone (Velde, 2003, p. 27).

Law appears to have decided that France should have an interest rate lower than Holland's 3 percent. Murphy (1997, p. 199, pp. 215–16) suggests that Law aimed to "force down the interest rate to the magic figure of two percent" and that he sought to halt the rapidly rising price of company stock once shares had reached a price of 10,000 livres.[8] Shares had required help on the way up, with Law's bank purchasing shares at announced prices. When share prices peaked and began to fall, Law supported the market by printing more bank notes and using them to buy shares. A quickly aborted attempt to withdraw this price support encouraged share selling, which Law countered with further share purchases and even faster money creation. Bank notes started to fall precipitously in value against silver, despite successive prohibitions against holding specie and using it in transactions. Law finally announced a phased 50 percent reduction in the livre-denominated value of each note, so that a note with 100 livres in face value would be considered worth only 50 livres.[9] This step turned public opinion against him. The story of Law's fall contains many twists, turns, and a host of enemies, but Law essentially found that any alteration in the

[8] Could Law have regarded 10,000 livres as consistent with a 2 percent interest rate? His company had announced a fixed semi-annual dividend of 100 livres per year in December 1719. If we plug annual dividends (D) of 200, a price (P) of 10,000 and growth of dividends (g) of zero into the simplest (Gordon, 1962) steady state asset price model we have a long-term (nominal) interest rate (R) of 2 percent: $(D/P) = R - g$. Recall, however, that inflation was 25 percent in January 1720! Velde (2007) interprets Law's target slightly differently: as a price to earnings ratio. Velde suggests a price to earnings target of 45 which is consistent with his view that the share price peaked at a somewhat lower level than Murphy's 10,000 livres. See Velde's detailed discussion of the difficulties of interpreting and combining quotations into a single price series for the company.

[9] The different phases of this train wreck are set out in mesmerizing detail by Murphy (1997, p., chapters 16 and 17) and Velde (2003, 2007).

system that sought to bring the value of company stock and Royal Bank notes back to realistic levels was met with public rage, and thus required his disgrace.

Law wrote of having created a "system"—and in doing so created a pariah phrase that would infamously echo in Scottish political economy.[10] His system promised to dissolve the government's dire fiscal constraints while generating a generation of millionaires. But the evaporation of financial wealth left little public sympathy for Law, who fled to Venice and was unflatteringly portrayed in a series of contemporary cartoons and as a variety of dramatic personae that ranged from Mephistopheles in Goethe's *Faust*, to Aeolus (the god of the winds) in Montesquieu's *Persian Letters*. Law's image after his fall is portrayed in Buchan (1995), Wennerlind (2003), and in an amusing volume of contemporary Dutch satirical prints available online from the Kress Collection of Harvard's Baker library (Anonymous, 1620).

Richard Cantillon's Economic Base

Law and Petty offered their advice to ministers, parliamentarians, and the public—leaving in their wake a trail of publications and proposals. In contrast, Richard Cantillon's life (1680s?–1734?), views, and activities were distinctly private, seemingly wrapped in mystery. Murphy's (1986, p. 10) masterful biography shows that even the date of Cantillon's birth in North Kerry, Ireland, is uncertain. His grandfather and great-grandparents had been stripped of large landholdings after Petty's survey, so his parents were likely farmers. Richard sought and found his fortune in Paris, where two relations were important bankers. Discretion marked his career from the outset, because he served as an agent for one of the greatest war profiteers of all time (James Bridges, later Duke of Chandos). He then revived his cousin's failing bank in Paris and became very wealthy by simultaneously shorting Mississippi stock and the livre. He quietly sold Mississippi stock deposited with him as collateral, requiring the speculative borrowers to repay him in sterling.

[10] For example, here is Adam Smith (1759 [1976]) on the "man of system" in *Theory of Moral Sentiments* (VI.II.42): "The man of system, on the contrary, is apt to be very wise in his own conceit; and is often so enamoured with the supposed beauty of his own ideal plan of government, that he cannot suffer the smallest deviation from any part of it. He goes on to establish it completely and in all its parts, without any regard either to the great interests, or to the strong prejudices which may oppose it. He seems to imagine that he can arrange the different members of a great society with as much ease as the hand arranges the different pieces upon a chess-board. He does not consider that the pieces upon the chess-board have no other principle of motion besides that which the hand impresses upon them; but that, in the great chess-board of human society, every single piece has a principle of motion of its own, altogether different from that which the legislature might chuse to impress upon it. If those two principles coincide and act in the same direction, the game of human society will go on easily and harmoniously, and is very likely to be happy and successful. If they are opposite or different, the game will go on miserably, and the society must be at all times in the highest degree of disorder."

The resulting litigation may have helped stimulate him to write the *Essay on the Nature of Commerce in General* so that his lawyers could draw upon its discussion of exchange rates. Yet the elegant and very influential structure of the work clearly follows an autonomous logic. The *Essay* circulated only in manuscript(s?) until its publication in 1755.[11]

Cantillon's (1755 [2001]) point of departure in the *Essay* is clear: "The Land is the Source or Matter from whence all is produced" (p. 5). In contrast, labor and population adjust themselves to the possibilities for employment at a wage determined by social conventions: "The Number of Labourers, Handicraftsmen and others, who work in a State is naturally proportioned to the Demand for them" and "a single generation suffices to push the increase of the Population as far as the produce of the Land will provide means of subsistence" (p. 13, 36). In this way, Cantillon criticizes Petty's "fanciful" assumption of constant population growth from the flood onwards. Cantillon adopts Petty's formulation of value as "proportionable to the Land and Labour which enters into their production," but in his analysis, value ultimately rests upon land, not labor (pp. 21, 42).

In contrast to Petty's enthusiasm for improvement and innovation, Cantillon's theorizing occurs against a backdrop of technological stasis. In this approach, the pattern of demand (and international trade) determines the level of employment. Higher consumption standards, such as eating meat, require more acres per person. Cantillon (1755 [2001]) suggests, contra Petty, that England's population has been decreasing because of this constraint (p. 37). Thus, Petty's oft-expressed hope for greater Irish cattle exports is anathema in Cantillon's system. Like Petty, Cantillon repeatedly decries the importation of foreign luxuries, but Cantillon's concern lies with the land constraint. In the spirit of general equilibrium, his thought is that the factor content of net imports should be heavily weighted towards land and away from labor-intensive products like lace (Cantillon 1755 [2001], p. 40). Nearly echoing Petty, Cantillon places considerable faith in the power of demonstration effects to change tastes. From Cantillon's perspective, the growing taste for urban and equestrian delights was also detrimental to employment and population because it represents the increase of land-intensive activities at the expense of labor-intensive ones (p. 93, 29). In effect, it was a case of horses "eating" men. Thus, in Cantillon's thinking population swiftly fills any available economic niches, while for Petty population grows exogenously and must be kept fully employed in the context of a far-distant land constraint.

Cantillon's (1755 [2001]) tripartite *Essay* culminates in a thundering condemnation of the confluence of Law's financial innovations with a longstanding tradition of political manipulation of financial markets. The critique is constructed upon

[11] I will quote here from the translation by Higgs throughout. Brewer (2005) discusses the manuscript's influence on Quesnay and the *Tableau Economique*. Hayek (1931 [1985]) considers its possible influence on Hume. See Murphy (1986a, p. 306–19, 247–48) on its publication and Cantillon's defense against usury charges.

the same "real side" analysis of production that challenged Petty's policies. Because transport is costly, the price of produce falls as one moves farther from an urban center. But the price level roughly corresponds to the ratio of money to goods. Hence the scarcity of money (relative to goods) that Law had railed against in Scotland is just the inevitable result of transportation costs and location. It had nothing to do with the supply of money per se. The real solution, in Cantillon's view, is to move manufacturing to the countryside. This will bid up the price of local produce.

Monetary expansion is given a distinctly mixed review by Cantillon (1755 [2001]). Local mines are the first source of monetary expansion examined, with the short-run and long-run effects explicitly distinguished. Discovering a new vein of silver increases spending by the landlords, entrepreneurs, and workers of the mine. This creates more work for people who supply consumption goods (this latter group, while not unemployed, is said "not [to have had] so much to do before"). But the extra spending "diminishes of necessity the share of the other inhabitants of the State who do not participate at first in the wealth of the Mines in question" (p. 68). Cantillon's description of the shifting pattern of relative prices and sectoral outputs during the expansionary process was much admired by Hayek (1931 [1985]). As the monetary flow continues, prices, rents, and wages are bid up until the nation becomes an exporter of metallic money and an importer of manufactured goods. Since Cantillon (oddly?) treats mining as a land-intensive sector, the long-run effect of the mines will be a reduction in population and the labor force.

Seven different sources of monetary expansion are examined, each having somewhat different first-round effects. But attention is concentrated on trade surpluses: they tend to increase output and lower interest rates because the new money appears in the hands of producers and entrepreneurs, who are "eager to acquire property" so their consumption does not increase as quickly as their income. Sustainability of the trade surplus depends upon location and transport costs: if raw produce can be imported cheaply, then price increases need not choke off the surplus. In this scenario, the role of monetary policy, if we may call it that, is to withdraw money slowly from circulation so as to keep prices down and extend the trade surplus. Cantillon has not even mentioned paper money at this point in his book, yet, monetary expansion has been linked with population reduction, and monetary contraction with trade surpluses and population growth.

Law goes unmentioned by name in Cantillon's *Essay*, but his presence begins to be felt as Cantillon describes France's cyclical political economy: one in which hot money flows alternately in and out of the country as finance ministers come and go. In the downwards phase, the currency is devalued to reduce the real value of government borrowing and other partial defaults are announced. Some foreigners sell government debt at diminished prices and take money out of the country. The price level falls. Once prices have been low enough for long enough, the stage is set for an increase in exports and a trade surplus that (with the right promotion) will revive foreign lending and ignite the upwards phase. Cantillon (1755 [2001]. p. 80)

remarks: "An able minister is always able to make it recommence this round. Not many years are needed to see it tried and succeed, at least at the beginning which is its most interesting position." Government willingness to exploit this cycle (due perhaps to the demands of war) rendered foreign borrowing a potential "fire of straw." Law's bonfire burned especially bright once he added a national bank's paper to the blaze.

With this cycle of political economy in mind, Cantillon produced two distinct fortunes from Law's scheme, going long in its early days, and then simultaneously shorting the Mississippi stock and the French currency. Cantillon's bets against the system did not endear him to Law, who threatened him with imprisonment in the Bastille, but once the edifice had begun to crumble in earnest, Law unsuccessfully sought to enlist Cantillon in repairing the system (Murphy, 1986, p. 172–75).

Towards Balance

Each of these three authors stands at a different extreme. Hardly a page of Petty's work passes by without the prospect of another great improvement passing before our eyes. Petty always sees the possibility for multiplication, as epitomized by his machine for "double writing" and his "double bottomed" ship. Improvements in transportation were particularly important, because they increased export demand. This set in motion a multiplied increase in output and reduced unemployment (of labor and land). Though exports were the preferred source of demand stimulus, Petty found considerable scope for greater demand stimulus in government's fiscal policies. Law also saw unemployed resources all around him and felt the possibility for financial innovation in the air. Law was intent upon driving interest rates far below Petty's lower limit. In contrast, Cantillon constructs his *Essay* upon a foundational land constraint and an input–output-like description of the real economy. Cantillon is a "supply side" economist, but in a rather different sense and spirit than his modern descendants. Cantillon stands against Petty and Law's demand-side stimuli as well as their enthusiasm for innovation. For Cantillon, the essence of good policy was to be found in accommodating the unchanging land constraint, rather than seeking innovations to alter it. Cantillon would not admit the possibility that an economy could be substantially off its land constraint.

With three centuries of hindsight, modern economists see more deeply into these issues than did Petty, Law, and Cantillon. Still, the complexity of the interplay between macroeconomic outcomes and policy choices seems almost expertly designed, as if by an invisible hand, to keep economists rethinking exactly how to strike the appropriate balance.

■ *I must thank Joseph Persky and Deirdre McCloskey for a big push of encouragement (and criticism) as well as Glenn Hueckel and Margaret Schabas for helpful comments. Neither they nor Timothy Taylor's invisible but very adroit editorial hand bear any responsibility for my remaining errors and omissions.*

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