

ECO 2210Y:

Topics in the Economic and Social History of Later Medieval and Renaissance Europe

Topic No. 22: The European 'Price Revolution' Era, c.1540 - c.1640: The Problems of Inflation and Economic Growth in Early Modern Europe

READINGS:

Within each section, all readings are listed in the chronological order of original publication (when that can be ascertained), except for collections of essays.

A. Some Textbook Surveys: Europe and England

Note that the chief failing of many of these surveys is inadequate or faulty economics.

1. Sir George Clark, The Wealth of England, 1496-1760 (London, 1946), chapter 2, 'England During the Price Revolution,' pp.41-56. Surprisingly good, despite its age.
- * 2. Peter Ramsey, Tudor Economic Problems (London, 1965, chapter 4, 'Prices and Social Change,' pp. 113-45. Quite a good discussion of the forces for inflation, monetary and demographic, though still with some errors in both economics and economic history.
3. Frank C. Spooner, 'Secular Price Movements and Problems in Capital Formation,' in Deuxième conférence internationale d'histoire économique/Second International Conference of Economic History, Aix-en-Provence 1962, École pratique des hautes études - Sorbonne, Sixième Section: Sciences économiques et sociales, Congrès et Colloques, tome VIII (Mouton and Co: Paris-The Hague, 1965), pp. 127-40.
4. Ruggiero Romano, 'Mouvement des prix et développement économique: le cas de l'Amérique du Sud au XVIIIe siècle,' in Deuxième conférence internationale d'histoire économique/Second International Conference of Economic History, Aix-en-Provence 1962, École pratique des hautes études - Sorbonne, Sixième Section: Sciences économiques et sociales, Congrès et Colloques, tome VIII (Mouton and Co: Paris-The Hague, 1965), pp. 141-52.
- * 3. Harry A. Miskimin, The Economy of Later Renaissance Europe, 1460-1600 (1969; 2nd edn. Cambridge, 1977), chapter 2, pp. 20-46. Fairly good, intelligently presented survey, if somewhat oversimplified.
4. L.A. Clarkson, The Pre-Industrial Economy in England, 1500-1750 (London, 1971): chapters 2 and 3.

- ** 5. Ralph Davis, The Rise of the Atlantic Economies (1973), chapter 6: ‘The Sixteenth and Seventeenth Centuries: Population, Prices, and Incomes,’ pp. 88-107. Excellent survey, if somewhat weak on economics.
6. Immanuel Wallerstein, The Modern World System: Capitalist Agriculture and the Origins of the European World Economy in the Sixteenth Century (New York and London, 1974), chapter 2, pp. 66-131.
7. Walter Minchinton, ‘Patterns and Structure of Demand, 1500-1750,’ in C.M. Cipolla, ed., Fontana Economic History of Europe, Vol. II: Sixteenth and Seventeenth Centuries (London, 1974), pp. 83-176.
8. Hermann Kellenbenz, Rise of the European Economy: Economic History of Continental Europe, 1500-1750 (London, 1976), pp. 15-27, 190-4. Somewhat disappointing.
9. Jan De Vries, The Economy of Europe in an Age of Crisis, 1600-1750 (Cambridge, 1977), chapter 1, pp. 1-29.
- ** 10. Donald C. Coleman, The Economy of England, 1450-1750 (Oxford, 1977), chapter 2, ‘Population and Prices, Mainly to 1650,’ pp. 12-50. Very good survey indeed.
- * 11. Christopher Clay, Economic Expansion and Social Change: England, 1500 - 1700, 2 vols. (Cambridge, 1984), Vol. I: People, Land, and Towns, chapter 2, ‘The Course of Prices,’ pp. 28 - 51 (with tables). Quite comprehensive, very up to date, generally very good, if not always solid in economic theory (in not clearly distinguishing between changes in relative prices and changes in the price level: a failing of most historical studies on this debate).
12. Dennis O. Flynn, ed., World Silver and Monetary History in the Sixteenth and Seventeenth Centuries (Aldershot: Variorum, 1996). Collected essays.

B. The Debate over the Price Revolution

1. George A. Moore, ed., The Response of Jean Bodin to the Paradoxes of Malestroit and The Paradoxes, translated from the French Second Edition, Paris 1578 (Washington, D.C.: Country Dollar Press, 1946). The historic origins of the debate.¹

¹ See also Jean-Yves Le Branchu, ed., Écrits notables dur la monnaie, XVIe siècle: De Copernic à Davanzati reproduts, traduits, d’après les éditions originales et les manuscrits, avec une introduction, des notices et des notes, Collection des principaux économistes, nouvelle édition, 2 vols. (Paris: Librairie Félix Alcan, 1934); Les paradoxes du Seigneur de Malestroict, conseiller du Roy, et Maistre ordinaire de ses comptes, sur le faict des monnoyes, presentez à sa Majesté, au mois de mars MDLXVI (Paris, 1566); La response de maistre Jean Bodin advocat en la cour au paradoxe des monsieur de Malestroit touchant l’enchérissement de toutes choses et le moyen d’y remedier (Paris: Chez Martin le Jeuen, 1568). Original edition.

2. Georg Wiebe, Zur Geschichte der Preisrevolution des XVI. und XVII. Jahrhunderts (Leipzig, 1895). The classic exposition of the monetary thesis, providing the origins of the modern debate.
- * 3. Earl Hamilton, 'American Treasure and Andalusian Prices, 1503-1660: A Study in the Spanish Price Revolution,' Journal of Economic and Business History, 1 (1928), reprinted in P.H. Ramsey, ed., The Price Revolution in Sixteenth-Century England (London, 1971), pp. 147-81. The study that sparked the modern debate, though his monetary ideas were obviously not original.
- * 4. Earl J. Hamilton, 'American Treasure and the Rise of Capitalism, 1500-1700,' Economica, 27 (Nov. 1929), 338-57.
5. Earl Hamilton, 'Imports of American Gold and Silver into Spain, 1503-1660,' Quarterly Journal of Economics, 43 (1929): 436-72.
6. Earl Hamilton, American Treasure and the Price Revolution in Spain, 1501-1650 (Cambridge, Mass., 1934; reissued 1965). See especially Chapter XII: 'Wages: Money and Real,' pp. 262-82; and Chapter XIII: 'Why Prices Rose,' pp. 283-308. See also the Appendices (pp. 309-403), with statistical tables on prices and wages.
7. Moritz John Elsas, 'Price Data from Munich, 1500 - 1700,' Economic History: supplement to The Economic Journal, 3 (February 1935), 63 - 78. Evidently the first to argue for a demographic explanation of the Price Revolution.
8. Earl Hamilton, Money, Prices, and Wages in Valencia, Aragon, and Navarre, 1351 - 1500 (Cambridge, Massachusetts: Harvard University Press, 1936).
- * 9. Carlo M. Cipolla, 'La prétendue 'revolution des prix': Réflexions sur l'expérience italienne,' Annales: Économies, sociétés, civilisations, 10 (1955), 513-16. Reprinted in Peter Burke, ed., Economy and Society in Early Modern Europe: Essays from Annales (London, 1972), pp. 43-46. One of the earliest attacks on Hamilton's Price-Revolution thesis.
10. Ingrid Hammarstrom, 'The Price Revolution of the Sixteenth Century: Some Swedish Evidence,' The Scandinavian Economic History Review, 5 (1957). Reprinted in Peter Ramsey, ed., The Price Revolution in Sixteenth-Century England, Debates in Economic History series (London, 1971), pp. 42-58. Another assault on Hamilton, with faulty economics and faulty historical data.
11. Y.S. Brenner, 'The Inflation of Prices in Early Sixteenth-Century England,' Economic History Review, 2nd ser., 14 (1961-62). Reprinted in Peter Ramsey, ed., The Price Revolution in Sixteenth-Century England, Debates in Economic History series (London, 1971), pp. 69-90. Similarly attacks Hamilton.
12. Y.S. Brenner, 'The Inflation of Prices in England, 1551-1650,' Economic History Review, 2nd ser. 15 (1962-3), 266-84.

13. J.D. Gould, 'The Price Revolution Reconsidered,' Economic History Review, 2nd ser., 17 (1964-65). Reprinted in Peter Ramsey, ed., The Price Revolution in Sixteenth-Century England, Debates in Economic History series (London, 1971), pp. 91-116.
14. F.P. Braudel and F. Spooner, 'Prices in Europe from 1450 to 1750,' in E. E. Rich, ed., Cambridge Economic History of Europe, Vol. IV: The Economy of Expanding Europe in the 16th and 17th Centuries (1967), pp. 374-486. Only for the more courageous: very long, often opaque and certainly difficult for novices in this field. To be skim-read.
- ** 15. R.B. Outhwaite, Inflation in Tudor and Early Stuart England, Studies in Economic and Social History Series, (1969; 2nd edn., London, 1982). Very compact in 60 pages; and very thorough -- though it may require a second reading to become clear. Do not, however, accept everything he says uncritically, especially because of some weaknesses in economics. The second edition does not adequately reflect the scholarship published since his first editon.
16. Frederic Mauro, Le XVIIe siècle européen: aspects économiques, Nouvelle Clio no. 32 (Paris, 1970). It would be desirable but quite impractical to read the whole book. For those who read French well, Part II: chapter 2, 'La demande' and chapter 3, 'Les jeux de l'offre et de la demande,' pp. 156-264.
- * 17. Peter Ramsey, ed., The Price Revolution in Sixteenth-Century England, Debates in Economic History series (London, 1971).
- (a) Peter Ramsey, 'Introduction,' pp. 1-18.
- (b) E.H. Phelps Brown and Sheila Hopkins, 'Seven Centuries of the Prices of Consumables Compared with Builders' Wage Rates,' pp. 18-41. Reprinted from Economica, 23 (November 1956).
- (c) Ingrid Hammarstrom, 'The Price Revolution of the Sixteenth Century: Some Swedish Evidence,' pp. 42-68. Reprinted (with some omissions) from The Scandinavian Economic History Review, 5 (1957).
- (d) Y.S. Brenner, 'The Inflation of Prices in Early Sixteenth- Century England,' pp. 69-90. Reprinted from Economic History Review, 2nd ser., 14 (1961-62).
- * (e) J.D. Gould, 'The Price Revolution Reconsidered,' pp. 91-116. Reprinted from Economic History Review, 2nd ser., 17 (1964-65).
- (f) C.E. Challis, 'The Circulating Medium and the Movement of Prices in Mid-Tudor England,' pp. 117-46. [Original publication.]
- * (g) Earl J. Hamilton, 'American Treasure and Andalusian Prices, 1503-1660: A Study in the Spanish Price Revolution,' pp. 147-81. One of the original studies in this debate, The Journal of Economic and Business History, 1

(Nov. 1928).

Again, do not accept everything in this collection uncritically; and read carefully the review of this book in the following:

Donald McCloskey, 'Review of Ramsey, ed., The Price Revolution,' in The Journal of Political Economy, 80 (1972), 1332-35.

- * 18. Peter Burke, ed., Economy and Society in Early-Modern Europe: Essays from Annales (London, 1972):
- (a) Carlo Cipolla, 'The So-Called 'Price Revolution': Reflections on the Italian Situation,' pp. 43 -46. Reprinted in translation from Annales: Économies, sociétés, civilisations, 10 (1955).
 - (b) Alexandre Chabert, 'More About the Sixteenth-Century Price Revolution,' pp. 47 - 54. Reprinted in translation from Annales: Économies, sociétés, civilisations, 12 (1957).
 - (c) Charles Verlinden, J. Craeybecks, E. Scholliers, 'Price and Wage Movements in the Sixteenth Century,' pp. 55 - 84. Reprinted in translation from Annales: Économies, sociétés, civilisations, 10 (1955).
 - (d) Stanislas Hoszowski, 'Central Europe and the Sixteenth- and Seventeenth-Century Price Revolution,' pp. 85 - 1093. Reprinted in translation from Annales: Économies, sociétés, civilisations, 16 (1961).
- N.B. The same warning applies to this collection as to the Ramsey collection (1971).
19. F.P. Braudel, The Mediterranean and the Mediterranean World in the Age of Philip II, Vol. I (London, 1972), pp. 462-542.
- * 20. Christopher Challis, 'Spanish Bullion and Monetary Inflation in England in the Later Sixteenth Century,' Journal of European Economic History, 4 (1975), 381-92.
21. Robert Doughty, 'Industrial Prices and Inflation in Southern England 1401-1640,' Explorations in Economic History, 12 (1975), 177-92.
22. Denis Richet, 'Causes of Inflation in France in the XVIth Century: Problems of Measurement and Interpretation,' Journal of European Economic History, 4:3 (Winter 1975), 707-16.
- * 23. Harry Miskimin, 'Population Growth and the Price Revolution in England,' Journal of European Economic History, 4 (1975), 179-85. Reprinted in his Cash, Credit and Crisis in Europe, 1300 - 1600 (London: Variorum Reprints, 1989), no. xiv. [This issue of the journal is now missing; but Xeroxed copies of the article are placed in the Sidney Smith Lending Library and the Sigmund Samuel Library.]

- * 24. Dennis O. Flynn, 'A New Perspective on the Spanish Price Revolution: The Monetary Approach to the Balance of Payments,' Explorations in Economic History, 15 (1978), 388-406. An interesting and novel approach, using modern monetary economics.
- * 25. Jack A. Goldstone, 'Urbanization and Inflation: Lessons from the English Price Revolution of the Sixteenth and Seventeenth Centuries,' American Journal of Sociology, 89 (1984), 1122 - 60. An important new dimension on the Price Revolution, with interesting views on urbanization and changes in the transactions velocity of money.
- * 26. Peter Lindert, 'English Population, Wages, and Prices: 1541 - 1913,' The Journal of Interdisciplinary History, 15:4 (Spring 1985), 609 - 34. Also an important article, relating demographic and monetary changes, influenced by Goldstone (1984).
- * 27. Michael D. Bordo, 'Explorations in Monetary History: A Survey of the Literature,' Explorations in Economic History, 23 (1986), 339-415. On the Price Revolution: see pp. 373-74, with comments on Lindert and Goldstone.
- ** 28. Douglas Fisher, 'The Price Revolution: A Monetary Interpretation,' Journal of Economic History, 49 (December 1989), 883 - 902.
- 29. Charles P. Kindleberger, Spenders and Hoarders: The World Distribution of Spanish American Silver, 1550 - 1750 (Singapore: Institute of Southeast Asian Studies, 1989).
- 30. Kerry W. Doherty and Dennis O. Flynn, 'A Microeconomic Quantity Theory of Money and the Price Revolution,' in Eddy Van Cauwenberghe, ed., Precious Metals, Coinage and the Changes of Monetary Structures in Latin-America, Europe and Asia (Late Middle Ages - Early Modern Times) (Leuven: Leuven University Press, 1989), pp. 185 - 208.
- 31. Renate Pieper, 'The Volume of African and American Exports of Precious Metals and its Effects in Europe, 1500 - 1800,' in Hans Pohl, ed., The European Discovery of the World and its Economic Effects on Pre-Industrial Society, 1500 - 1800: Papers of the Tenth International Economic History Congress (Stuttgart: Franz Steiner Verlag, 1990), pp. 97 - 121.
- 32. Emmanuel Le Roy Ladurie, Jean-Noël Barrandon, Bruno Collin, Maria Guerra, Cécile Morrisson, 'Sur les traces de l'argent du Potosi,' Annales: Économies, sociétés, civilisations, 45:2 (mars-avril 1990), 483 - 505.
- 33. Jack A. Goldstone, 'The Causes of Long Waves in Early Modern Economic History,' in Joel Mokyr, ed., The Vital One: Essays in Honor of Jonathan R. T. Hughes (Research in Economic History, Supplement no. 6, Greenwich, Conn., 1991), pp. 51 - 92.
- * 34. Jack A. Goldstone, 'Monetary Versus Velocity Interpretations of the 'Price Revolution': A Comment,' Journal of Economic History, 51 (March 1991), 176 - 81. An important

question to consider: is **Velocity** a monetary or real variable?

- * 35. John Munro, 'The Central European Mining Boom, Mint Outputs, and Prices in the Low Countries and England, 1450 - 1550,' in Eddy H.G. Van Cauwenberghe, ed., Money, Coins, and Commerce: Essays in the Monetary History of Asia and Europe (From Antiquity to Modern Times) (Leuven: Leuven University Press, 1991), pp. 119-83. On the South-German monetary origins of the Price Revolution. See also Nef (1941, and 1952) in section C, following.
- 36. Renate Pieper, 'American Silver Production and West European Money Supply in the Sixteenth and Seventeenth Century,' in José Casas Pardo, ed., Economic Effects of the European Expansion, 1492 - 1824, Beiträge zur Wirtschafts- und Sozialgeschichte Band 51 (Stuttgart: Franz Steiner Verlag, 1992), pp. 77-98.
- * 37. John H. Munro, 'Patterns of Trade, Money, and Credit,' in Thomas A. Brady, jr., Heiko O. Oberman, and James D. Tracy, eds., Handbook of European History, 1400-1600: Late Middle Ages, Renaissance and Reformation, Vol. I: Structures and Assertions (Leiden/New York/Cologne: E.J. Brill, 1994), pp. 170-79.
- ** 38. Nicholas J. Mayhew, 'Population, Money Supply, and the Velocity of Circulation in England, 1300 - 1700,' Economic History Review, 2nd ser., 48:2 (May 1995), 238-57.
- 39. Harry A. Miskimin, 'Silver, not Sterling: A Comment on Mayhew's Velocity,' and N.J. Mayhew, 'Silver, Not Sterling: A Reply to Prof. Miskimin,' The Economic History Review, 2nd ser., 49:2 (May 1996), 358-61.
- 40. David Hackett Fischer, The Great Wave: Price Revolutions and the Rhythm of History (Oxford and New York: Oxford University Press, 1996). Warning: written by an historian, whose knowledge of economics is both very limited and faulty. Not to be trusted for its economic analyses. Very controversial book. See my review of this book on the web, at: EH.Net Review <ehreview@eh.net>, 24 February 1999.
- 41. S.M.H. Bozorgnia, The Role of Precious Metals in European Economic Development: From Roman Times to the Eve of the Industrial Revolution, Contributions in Economics and Economic History no. 192 (Wesport, Conn. and London: Greenwood Press, 1998). A very badly researched and badly written book that must be rejected. See my review of this book in Journal of Economic History, 59:4 (Dec. 1999).
- 42. John Munro, 'Precious Metals and the Origins of the Price Revolution Reconsidered: The *Conjuncture* of Monetary and Real Forces in the European Inflation of the Early to Mid-Sixteenth Century,' in Clara Eugenia Núñez, ed., Monetary History in Global Perspective, 1500 - 1808, Proceedings of the Twelfth International Economic History Congress at Madrid, August 1998 (Seville, 1998), pp. 35-50.

N.B. The most interesting development in monetary theory concerning the nature of inflation during the 'Price Revolution' has been the application of the **monetary approach to the balance of**

payments, which you can find especially in Flynn (1978) and Fisher (1989) above. For the economic theory involved, you should consult the following studies:

- (1) Jacob A. Frenkel and Harry G. Johnson, eds., The Monetary Approach to the Balance of Payments (Toronto: University of Toronto Press, 1976):
 - a) Jacob Frenkel and Harry Johnson, 'The Monetary Approach to the Balance of Payments: Essential Concepts and Historical Origins,' pp. 21-45.
 - b) Harry Johnson, 'Towards a General Theory of the Balance of Payments,' pp. 46-63.
 - c) Harry Johnson, 'The Monetary Approach to Balance-of-Payments Theory,' pp. 147-67.
 - d) Harry Johnson, 'The Monetary Theory of Balance-of-Payments Policies,' pp. 262-86.
 - e) Donald N. McCloskey and J. Richard Zecher, 'How the Gold Standard Worked, 1880-1913,' pp. 357-85.
- (2) John E. Floyd, World Monetary Equilibrium: International Monetary Theory in an Historical-Institutional Context (University of Pennsylvania Press, 1985), especially chapters 4 and 5.

C. Specialized Studies on Mining for Precious Metals:

1. Adolf Soetbeer, Edelmetall-Produktion und Werthverhältniss zwischen Gold und Silber seit der Entdeckung Amerika's bis zur Gegenwart (Gotha: Justus Perthes, 1879).
- * 2. John Nef, 'Silver Production in Central Europe, 1450-1618,' Journal of Political Economy, 49 (1941), 575-91.
- * 3. John Nef, 'Mining and Metallurgy,' in M.M. Poston, ed., Cambridge Economic History, Vol. II: Trade and Industry in the Middle Ages (Cambridge, 1952), pp. 456-93. Reprinted without changes, in the 2nd revised edn. of The Cambridge Economic History of Europe, Vol. II, edited by M.M. Postan and Edward Miller (Cambridge, 1987), pp. 691-761, especially pp. 721-46. Very important for the Central European silver mining boom of ca. 1460 - ca. 1530. See also Nef (1941) above.
4. Josef Vlachovic, 'Slovak Copper Boom in World Markets of the Sixteenth and in the First Quarter of the Seventeenth Centuries,' Studia historica slovacica, 1 (1963), 63-95.
5. Alan Probert, 'Bartolomé de Medina: the Patio Process and the Sixteenth-Century Silver Crisis,' Journal of the West, 8:1 (1969), 90- 124' reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).

6. D.A. Brading, 'Mexican Silver Mining in the Eighteenth Century: the Revival of Zacatecas,' Hispanic American Historical Review, 50:4 (1970), 665-81; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
7. Peter Bakewell, Silver Mining and Society in Colonial Mexico: Zacatecas, 1546 - 1700 (Cambridge, 1971).
8. Ekkehard Westermann, Das Eislebener Garkupfer und seine Bedeutung für den europäischen Kupfermarkt, 1460-1560 (Vienna: Böhlau Verlag, 1971).
9. Ekkehard Westermann, 'Die Bedeutung des Thüringer Saigerhandels für den mitteleuropäischen Handel an der Wende vom 15. zum 16. Jahrhundert,' Jahrbuch für die Geschichte Mittel- und Ostdeutschlands, 21 (1972), 68-92. [Ed. by Wilhelm Berges, Hans Herzfeld, and Henryk Skrzypczak].
10. D.A. Brading and Harry E. Cross, 'Colonial Silver Mining: Mexico and Peru,' and 'Estimated Minimum Spanish-American Bullion Production, 1571-1700,' Hispanic American Historical Review, 52 (1972), 545-79.
11. P.J. Bakewell, Silver Mining and Society in Colonial Mexico: Zacatecas, 1546-1700 (Cambridge, 1972).
12. Adolf Laube, Studien über den erzbergischen Silberbergbau von 1470 - 1546 (Leipzig, 1974).
13. Peter John Bakewell, 'Registered Silver Production in the Potosi District, 1550 - 1735,' Jahrbuch für Geschichte von Staat, Wirtschaft und Gesellschaft Lateinamerikas, 12 (1975), 67-103.
14. John Fisher, 'Silver Production in the Viceroyalty of Peru, 1776-1824,' Hispanic American Historical Review, 55:1 (1975), 25-43; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
15. Ian Blanchard, 'English Lead and the International Bullion Crisis of the 1550s,' in Donald Coleman and A. H. John, eds., Trade, Government, and Economy in Pre-Industrial England: Essays Presented to F. F. Fisher (London, 1976), pp. 21-44.
16. Peter Bakewell, 'Technological Change in Potosi: The Silver Boom of the 1570's,' in Richard Konetzke and Hermann Kellenbenz, et al., Jahrbuch für Geschichte von Staat, Wirtschaft und Gesellschaft Lateinamerikas, 14 (1977), 57-77; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
17. Hermann Kellenbenz, 'Europäisches Kupfer, Ende 15. bis Mitte 17. Jahrhundert:

- Ergebnisse eines Kolloquiums,' in Hermann Kellenbenz, ed., Schwerpunkte der Kupferproduktion und des Kupferhandels in Europa 1500-1650 (Cologne: Böhlau Verlag, 1977), pp. 290-351.
18. Peter Bakewell, 'Notes on the Mexican Silver Mining Industry in the 1590s,' Humanitas: Anuario del Centre de Estudios Humanisticos, 19 (1978), 383-409; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
 19. Richard L. Garner, 'Silver Production and Entrepreneurial Structure in 18th-Century Mexico,' Jahrbuch für Geschichte von Staat, Wirtschaft und Gesellschaft Lateinamerikas, 17 (1980), 157-85.
 20. Hermann Kellenbenz, ed., Precious Metals in the Age of Expansion: Papers of the XIVth International Congress of Historical Sciences (Stuttgart, 1981). See especially:
 - (a) Adon and Jeanne P. Gordus, 'Potosi Silver and the Coinage of Early Modern Europe,' pp. 225-41. Their views have been revised in Gordus (1988).
 - (b) Hermann Kellenbenz, 'Final Remarks: Production and Trade of Gold, Silver, Copper, and Lead, from 1450 to 1750,' pp. 307-61.
 - (c) Adam Szaszdi, 'Preliminary Estimates of Gold and Silver Production in America,' pp. 151-223.
 - (d) Herman Van der Wee, 'World Production and Trade in Gold, Silver, and Copper in the Low Countries, 1450-1700,' pp.
 - (e) Ian Blanchard, 'England and the International Bullion Crisis of the 1550s,' pp.
 - (f) Ekkehard Westermann, 'Tendencies in the European Copper Market in the 15th and 16th Centuries,' pp. 79-86.
 - (g) Oszkar Paulinyi, 'The Crown Monopoly of the Refining Metallurgy of Precious Metals and the Technology of the Cameral Refineries in Hungary and Transylvania in the Period of Advanced and Late Feudalism (1325-1700), pp. 27-39.
 21. Enrique Tandeter, 'Forced and Free Labour in Late Colonial Potosi,' Past and Present, no. 93 (1981), pp. 98-136; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
 22. Dennis Flynn, 'Sixteenth Century Inflation From a Production Point of View,' in E. Marcus and N. Smukler, eds., Inflation Through the Ages: Economic, Social, Psychological, and Historical Aspects (New York, 1983), pp. 157 - 69.

23. Philippe Braunstein, 'Innovations in Mining and Metal Production in the Late Middle Ages,' Journal of European Economic History, 12 (1983), 573 - 91.
24. John F. Richards, ed., Precious Metals in the Medieval and Early Modern Worlds (Durham, N.C., 1983). See especially:
- (a) Harry A. Miskimin, 'Money and Money Movements in France and England at the End of the Middle Ages,' pp. 79-96.
 - (b) John Munro, 'Bullion Flows and Monetary Contraction in Late-Medieval England and the Low Countries,' pp. 97-158.
 - (c) Philip D. Curtin, 'Africa and the Wider Monetary World, 1250 - 1850,' pp. 231-68.
- * (d) Harry E. Cross, 'South American Bullion Production and Export, 1550-1750,' pp. 397-424.
25. G. A. Aizen and J. Daniel, 'Natural Economies or Monetary Economies? Silver Production and Monetary Circulation in Spanish America (Late XVIth - Early XVIIth Centuries),' The Journal of European Economic History, 13 (Spring 1984), 99 - 115.
26. A.J. Russell-Wood, 'Colonial Brazil: The Gold Cycle, c. 1690-1750,' in Leslie Bethell, ed., The Cambridge History of Latin America, Vol. II: Colonial Latin America (Cambridge and New York: Cambridge University Press, 1984), pp. 547-600; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
27. Peter Bakewell, 'Mining in Colonial Spanish America,' in Leslie Bethell, ed., The Cambridge History of Latin America, Vol. II: Colonial Latin America (Cambridge and New York: Cambridge University Press, 1984), 105-51; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
28. Marie-Thérèse Boyer-Xambeu, Ghislain Deleplace, and Lucien Gillard, 'Métaux d'Amérique et monnaies d'Europe,' Annales: Économies, sociétés, civilisations, 43 (July-August 1988), 959 - 67.
29. A.A. and J.P. Gordus, 'Identification of Potosi Silver Usage in 16th and 17th-century Coinage through the Gold-Impurity Content of Coins,' in William Bischoff, ed., The Coinage of the Vice Royalty of Peru and Its Successor States, The American Numismatic Society (New York, 1988).
30. Ekkehard Westermann, 'Zur Silber- und Kupferproduktion Mitteleuropas vom 15. bis zum frühen 17. Jahrhundert,' Der Anschnitt: Zeitschrift für Kunst und Kulture im Bergbau, 38:5-6 (1986), 187-211.

31. John Coatsworth, 'The Mexican Mining Industry in the Eighteenth Century,' in Nils Jacobsen and Hans-Jürgen Puhle, eds., The Economies of Mexico and Peru during the Late Colonial Period, 1760 - 1810 (Berlin 1986), pp. 26-45; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
32. Ann Zulawski, 'Wages, Ore Sharing, and Peasant Agriculture: Labour in Oruro's Silver Mines, 1607-1720,' Hispanic American Historical Review, 67:3 (1987), 405-30; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
33. Richard L. Garner, 'Long-Term Silver Mining Trends in Spanish America: A Comparative Analysis of Peru and Mexico,' American Historical Review, 67:3 (1987), 405-30; reprinted in Peter Bakewell, ed., Mines of Silver and Gold in the Americas, Variorum Series: An Expanding World: The European Impact on World History, 1450 - 1800 (London, 1997).
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3. Earl J. Hamilton, American Treasure and the Price Revolution in Spain 1501-1650 (Cambridge, Mass., 1934; reissued in 1965). Various statistical appendices of considerable importance.
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QUESTIONS

1. What were the basic causes of European inflation in the sixteenth and early seventeenth centuries: monetary, or 'real' or some combination of the two? Be sure to understand the difference between *relative* price changes and changes in the *level of prices*.
2. On the monetary side: how much importance can you attribute to the influx and distribution of Central European silver (from ca. 1460 to ca. 1530), American silver (from ca. 1530), European coinage debasements, dishoardings and changes in the velocity of coinage circulation, to the expanded use of credit, and to government borrowings and expenditures?
3. If American treasure is seen as the major monetary factor by the mid-16th century, as many argue, how did the silver from the mines of Mexico and Peru get distributed to the various European countries -- and from one country to another?
4. On the 'real side', how much of the inflation may be attributed to the growth of population (demographic pressures): in particular to the rapid growth in demand for such commodities as grain, lumber, metals, wood, and fuels? Why would supply not keep pace with such demands? Can increases in the prices of specific commodities be termed 'inflationary'? Or can demographic and other such 'real factors account for no more than relative price changes? Are the 'monetary' and 'real' arguments contradictory, mutually exclusive, or complementary?
5. How useful an analytical tool is the Fisher Identity [$M.V = P.T$] for delineating and explaining the processes of inflation? How useful is the Cambridge 'cash balances' approach: $M = k.P.T$? How has Friedman and his school modified the modern quantity theory of money? How useful in turn is Keynesian economics in explaining the 16th-Century Price Revolution? (A question that should not be attempted by first-year students).
6. Why did the degree or rate of inflation and its consequences differ from one European country to another: Spain, France, Italy, England, the Low Countries, Scandinavia, etc.?
7. How does the analysis of the Sixteenth-Century 'Price Revolution' as found in your readings correspond to the analyses of our current inflation -- both in the press, and in economics texts? Can one talk about 'cost push' and 'demand pull' forces in the 16th Century? (See also question 5).
8. What is Hamilton's thesis of 'profit inflation'? Why did he think that the monetary inflation of the sixteenth century contributed to European industrialization, to the growth of larger-scale forms of industrial capitalism in particular? How has his thesis been challenged by later critics, such as Nef and Felix?
9. Apart from Hamilton's thesis, how much did inflation stimulate production, trade, and investment in Europe, England in particular, between 1540 and 1640? To what extent did inflation distort and damage the economic structure of some countries, hindering their economic development (e.g. Spain)?
10. To what extent, and under what circumstances, can inflation 'cheapen' the factor costs of production: of labour, land, and capital?

11. What were the social consequences of the Price Revolution: what social groups gained, and which ones lost by inflation?
12. How and why did the inflation of the 'Price Revolution' era come to an end in the course of the 17th century? Why did almost a century of either stable or falling prices, of deflation, ensue, to the eve of the modern Industrial Revolution? What role did monetary and real (demographic) factors play in that deflation, or secular downswing in the general price level? What were the economic and social consequences of that deflation.

Note: more consideration to such questions will be given in the topic on the 'General Crisis of the Seventeenth Century.'

Table 1.**Price Levels and Price Trends in England, 1450-1749 Mean Price Indices* and Mean Annual Rates of Price Changes, for 25-Year Periods.****Mean of Price Indices for 1451-1475 = 100 (Base)***

Quarter Century	Mean Price Index:* 1451-75=100	Mean Annual Percentage Change in Price Index	Standard Deviation (s.d.)	Coefficient of Variation (s.d./Mean)
1450-74	101.4	+0.08%	7.68	7.6
1475-99	104.6	+0.06%	18.52	17.7
1500-24	115.5	+1.47%	19.21	16.6
1525-49	168.8	+1.56%	29.57	17.5
1550-74	287.2	+0.20%	41.45	14.4
1575-99	401.6	+2.26%	94.71	23.6
1600-24	505.3	+0.69%	47.94	9.5
1625-49	595.6	+0.95%	81.48	13.7
1650-74	631.6	-0.42%	72.26	11.4
1675-99	616.7	+0.48%	74.01	12.0
1700-24	617.8	-0.09%	81.03	13.1
1725-49	587.6	-0.17%	51.00	8.7

* The Phelps Brown and Hopkins Price Index. See Sources for Table 2.

Table 2.

**Price-Relatives of Charcoal, Timber, Industrial Products, Grains, and the
Phelps-Brown & Hopkins 'Basket of Consumables' Index in Decennial
Averages, 1530-9 to 1640-9**

Average of 1530-9 = base 100

Decade	Charcoal (Cambridge)	Timber (National)	Industrial Products	Grains: Rye, Wheat, Oats, Barley	Basket of Cons- umables
1530-9	100	100	100	100	100
1540-9	122	115	115	116	124
1550-9	203	174	169	216	186
1560-9	217	178	198	196	180
1570-9	230	206	203	230	203
1580-9	270	247	209	282	230
1590-9	287	289	216	366	305
1600-9	320	335	233	348	306
1610-9	359	397	249	407	341
1620-9	345	450	240	399	333
1630-9	378	475	255	491	397
1640-9	535	524	278	488	398

Table 2, continued:

Weighting of the Phelps Brown and Hopkins Price Index:

Farinaceous Foods (Grains)	20.0%	
Meat and Fish	25.0%	
Butter and Cheese	12.5%	
Drink (Malt, Hops, etc.)	22.5%	
Subtotal: Food		80.0%
Fuel and Light	7.5%	
Textiles	12.5%	
Subtotal: Industrial Goods		20.0%
Total		100.0%

Sources:

(a) Charcoal: J.E. Thorold Rogers, *History of Agriculture and Prices in England*, IV: (1401-1582), 383-7; V (1583-1702), 398-402.

(b) Timber, industrial products, grains:

Peter Bowden, 'Agricultural Prices: Statistical Appendix,' in Joan Thirsk, ed., *Agrarian History of England and Wales*, IV: 1500-1640 (1967), Table XIII, 862.

(c) 'Basket of Consumables':

E.H. Phelps Brown and Sheila Hopkins, 'Seven Centuries of the Prices of Consumables,' in E.M. Carus-Wilson, ed., *Essays in Economic History*, Vol. II (1962), pp. 194-95; and E.H. Phelps Brown and Sheila Hopkins, *A Perspective of Wages and Prices* (London, 1981).

Table 3.	Composite Price Indices of Flanders, Brabant, England, Spain (Castile)						
	in quinquennial means: 1401-05 to 1595-1600						
	Indices: mean of 1451-75 = 100; and mean of 1501-10 = 100						
Years	FLANDERS	BRABANT	ENGLAND	SPAIN	BRABANT	ENGLAND	
5 yr means	1451-75=100	1451-75=100	1451-75=100	1501-10=100	1501-10=100	1501-10=100	
1401-05	87.57	64.27	114.84		53.50	109.08	
1406-10	103.35	68.55	111.23		57.07	105.65	
1411-15	95.39	73.97	108.10		61.58	102.68	
1416-20	107.21	80.54	113.40		67.05	107.71	
1421-25	110.86	90.19	101.48		75.08	96.38	
1426-30	119.24	100.15	112.27		83.37	106.63	
1431-35	124.57	102.76	108.48		85.54	103.03	
1436-40	141.73	125.43	122.01		104.42	115.89	
1441-45	114.09	105.48	92.52		87.81	87.88	
1446-50	109.55	99.58	100.90		82.89	95.84	
1451-55	100.47	98.54	100.25		82.03	95.22	
1456-60	117.68	114.58	97.06		95.38	92.19	
1461-65	89.48	91.07	102.73		75.81	97.58	
1466-70	95.50	96.95	106.74		80.71	101.39	
1471-75	96.87	98.85	97.76		82.29	92.85	
1476-80	115.04	120.69	90.06		100.47	85.54	
1481-85	157.75	155.75	127.38		129.66	120.99	
1486-90	190.08	174.10	102.77		144.93	97.61	
1491-95	153.43	133.22	106.80		110.90	101.44	
1496-00	101.00	115.35	96.70		96.03	91.85	
1501-05		125.45	106.79	92.43	104.43	101.43	
1506-10		114.80	103.77	107.57	95.57	98.57	
1511-15		137.90	108.52	98.98	114.80	103.08	
1516-20		150.26	120.44	104.28	125.09	114.39	
1521-25		179.94	146.05	122.14	149.79	138.72	
1526-30		178.52	157.34	131.57	148.61	149.45	
1531-35		173.99	155.64	132.44	144.84	147.83	

Table 4.	ENGLAND: PHELPS BROWN AND HOPKINS PRICE INDICES									
	Mean of 1451-75 = 100									
Year	Farinaceous:	Meat & Fish	Butter & Cheese	Drink: Malt, Hops, Sugar, Tea	Fuel and Light	Textiles	Composite (Munro)	Nominal Wage	Real Wage Index	Real Wage Index
	WRB Grains, Peas Potatoes							Index	Master	Labourer
	Weight = 20.0	25.0	12.5	22.5	7.5	12.5	100.00	1451-75=100	1451-75 = 100	1451-75 = 100
1264-65	80.00	95.00	74.00	80.00		74.03	82.44	50.10	60.72	45.54
1266-70	84.00	64.10	101.60	104.80		48.40	81.25	49.79	61.82	46.37
1271-75	129.00	97.00	95.80	131.00		36.40	103.84	49.94	48.71	36.53
1276-80	102.20	99.80	102.80	118.20		36.20	96.61	50.09	51.81	38.86
1281-85	110.80	92.80	94.00	154.30		40.90	104.80	50.06	48.16	36.12
1286-90	79.20	78.40	96.80	100.40		34.80	80.52	49.97	62.93	47.20
1291-95	137.80	75.00	96.80	157.60		44.20	107.45	49.85	47.22	35.42
1296-00	107.80	89.80	95.20	138.80		60.20	102.34	49.92	49.11	36.83
1301-05	91.60	88.20	93.60	119.00		52.60	92.35	55.70	59.57	44.68
1306-10	116.80	105.40	101.70	134.80		70.60	109.81	59.64	55.24	41.43
1311-15	114.20	116.60	134.40	126.40		75.60	115.33	66.91	58.32	43.74
1316-20	189.80	127.00	142.00	238.80		68.60	161.91	66.96	44.85	33.64
1321-25	160.00	106.40	153.40	174.80	164.20	68.40	137.97	67.26	48.87	36.65
1326-30	102.20	102.60	119.00	133.40	152.20	69.40	111.07	67.04	60.82	45.61
1331-35	112.00	100.20	113.00	148.20	147.00	65.40	114.12	66.99	59.55	44.66
1336-40	85.20	88.20	112.40	97.00	149.00	65.40	94.32	59.94	64.23	48.17
1341-45	81.00	85.00	110.40	98.60	139.00	49.60	90.06	50.17	55.78	41.83
1346-50	102.00	87.80	120.20	120.00	147.00	58.40	102.70	50.12	49.14	36.85
1351-55	125.40	110.80	123.40	165.60	158.60	118.60	132.18	59.69	46.51	34.89
1356-60	116.40	102.00	130.80	141.60	165.60	160.40	129.46	75.88	59.31	50.16
1361-65	132.60	122.80	125.80	200.60	168.40	127.40	146.64	82.97	57.05	51.35
1366-70	155.00	128.00	128.40	167.20	182.40	126.00	146.10	83.15	58.13	52.32
1371-75	133.20	136.40	129.60	128.00	163.60	138.00	135.26	82.87	62.26	56.03
1376-80	96.00	105.60	118.80	113.00	162.40	100.50	110.62	82.83	77.27	69.54
1381-85	103.60	110.20	107.00	123.60	152.40	96.10	112.90	83.22	73.89	66.50

Year	Farinaceous:	Meat &	Butter &	Drink: Malt,	Fuel and	Textiles	Composite	Nominal	Real Wage	Real Wage
	WRB Grains,	Fish	Cheese	Hops, Sugar,	Light		(Munro)	Wage	Index	Index
	Peas Potatoes			Tea				Index	Master	Labourer
	Weight = 20.0	25.0	12.5	22.5	7.5	12.5	100.00	1451-75=100	1451-75 = 100	1451-75 = 100
1386-90	83.20	108.40	101.80	108.40	139.00	90.00	102.53	82.90	81.31	73.18
1391-95	96.60	102.80	102.80	123.60	133.00	85.40	106.33	82.85	79.53	71.57
1396-00	106.20	106.40	114.20	127.40	124.40	85.80	110.84	83.17	75.59	68.03
1401-05	115.80	105.80	110.00	136.40	123.20	92.40	114.84	84.85	75.29	71.29
1406-10	109.20	105.60	114.20	119.80	120.20	102.00	111.23	92.97	87.56	85.89
1411-15	93.00	102.60	117.40	118.80	119.00	108.20	108.10	99.72	92.63	92.63
1416-20	116.40	103.60	115.30	126.60	111.00	104.00	113.40	100.22	89.13	89.13
1421-25	94.20	92.60	97.57	118.00	111.20	99.20	101.48	100.20	98.87	98.87
1426-30	104.60	98.80	110.42	133.60	124.60	108.40	112.27	99.89	91.00	91.00
1431-35	109.60	101.40		120.80	120.00	98.80	108.48	99.94	92.36	92.36
1436-40	146.20	106.80		141.80	114.20	98.00	122.01	99.91	85.41	85.41
1441-45	76.80	98.80		83.60	118.40	99.40	92.52	100.13	108.57	108.57
1446-50	96.00	106.20		96.40	106.80	97.40	100.90	99.86	99.23	99.23
1451-55	103.00	97.40		104.00	101.00	97.20	100.25	99.90	100.06	100.06
1456-60	93.40	100.80		90.80	100.60	100.80	97.06	100.02	103.12	103.12
1461-65	108.20	100.00		106.00	94.40	101.30	102.73	100.00	99.01	99.01
1466-70	103.80	111.80		99.40	108.60	108.40	106.74	99.97	93.72	93.72
1471-75	98.20	96.00		99.60	93.40	101.60	97.76	99.86	102.59	102.59
1476-80	106.00	79.20		83.80	92.00	107.20	90.06	99.89	111.68	111.68
1481-85	147.80	120.00		143.40	98.40	105.40	127.38	100.07	80.74	80.74
1486-90	108.00	105.80		88.80	90.20	118.00	102.77	99.72	98.06	98.06
1491-95	110.40	111.80		99.00	82.20	114.80	106.80	99.71	93.93	93.93
1496-00	100.80	95.80		91.00	83.20	111.20	96.70	99.82	103.51	103.51
1501-05	127.20	97.70		105.60	91.40	112.80	106.79	99.86	93.75	93.75
1506-10	101.80	113.50		90.60	86.20	112.00	103.77	99.96	96.39	96.39
1511-15	116.80	113.33		92.60	94.00	118.20	108.52	99.86	92.53	92.53
1516-20	120.20	126.17		120.40	97.60	117.40	120.44	99.86	83.66	83.66
1521-25	135.80	174.60		136.00	95.80	125.00	146.05	100.40	69.13	69.13

Year	Farinaceous:	Meat &	Butter &	Drink: Malt,	Fuel and	Textiles	Composite	Nominal	Real Wage	Real Wage
	WRB Grains,	Fish	Cheese	Hops, Sugar,	Light		(Munro)	Wage	Index	Index
	Peas Potatoes			Tea				Index	Master	Labourer
	Weight = 20.0	25.0	12.5	22.5	7.5	12.5	100.00	1451-75=100	1451-75 = 100	1451-75 = 100
1526-30	182.40	158.00		164.00	98.20	138.80	157.34	99.97	64.27	64.27
1531-35	161.60	164.20		164.40	98.40	139.00	155.64		65.01	65.01
1536-40	159.60	168.20		141.00	99.80	145.00	152.33		71.39	65.90
1541-45	162.80	225.00		146.20	98.20	154.80	176.54		65.36	56.89
1546-50	208.60	277.80		235.00	137.60	164.40	229.64		52.82	55.11
1551-55	289.80	329.00		253.66	174.60	191.60	275.45		50.89	58.16
1556-60	324.60	309.00		430.67	201.00	184.60	315.85		53.34	59.93
1561-65	253.00	328.00	357.60	302.80	216.40	221.20	289.31		57.74	64.96
1566-70	255.00	310.20	400.50	304.00	216.40	232.40	292.29	167.00	57.03	64.16
1571-75	286.80	333.60	353.80	292.40	224.60	227.80	296.09		58.09	64.20
1576-80	386.40	346.00	352.20	363.60	237.40	232.60	336.50		56.62	57.40
1581-85	367.20	354.70	375.40	348.40	237.80	258.00	337.52	200.06	59.29	59.29
1586-90	501.00	394.80	441.60	356.20	274.00	259.00	387.17	200.57	52.53	52.53
1591-95	476.60	416.60	503.00	448.40	265.00	263.20	416.01	200.02	49.05	49.05
1596-00	738.80	462.20	527.80	689.20	288.80	276.20	540.54	200.87	37.81	37.81
1601-05	534.80	473.00	506.00	514.00	294.40	280.60	461.26	200.27	43.73	43.73
1606-10	588.60	486.80	547.20	586.00	308.00	273.80	497.00	200.69	40.47	40.47
1611-15	673.80	517.40	605.60	594.60	332.60	274.40	532.84	199.25	37.74	37.74
1616-20	614.80	537.60	606.40	563.60	339.60	279.60	520.39	199.32	38.55	38.55
1621-25	646.40	532.60	566.80	612.00	335.20	268.80	529.72	199.08	37.99	37.99
1626-30	602.60	548.40	555.20	610.60	352.40	273.80	525.06		38.94	40.75
1631-35	784.80	548.00	604.10	796.60	339.00	274.00	608.38		37.43	37.95
1636-40	742.40	581.80	637.60	796.00	363.60	281.00	615.12		40.68	40.10
1641-45	603.80	576.40	637.20	658.40	438.60	279.60	560.50		47.92	49.58
1646-50	1012.00	667.60	805.20	869.80	428.80	292.60	734.39		39.32	41.73
1651-55	608.60	691.00	667.40	670.80	456.40	306.20	601.33		49.98	50.47
1656-60	759.00	648.20	710.00	746.40	446.20	290.00	640.26	300.17	47.16	47.16
1661-65	869.40	669.00	673.20	781.20	467.60	294.80	672.97	299.81	44.82	44.82

Beef					23.500	kg							
Herrings	40.00	fish			40.000	fish							
Butter	10.00	lb.			4.800	kg			13.610	kg			
Cheese	10.00	lb.			4.700	kg			13.610	kg			
Sub-total				20.00%				60.26	38.87%			44.66	35.08%
Industrial													
Charcoal	4.25	bushels			162.000	litres							
Candles	2.75	lb.			1.350	kg							
Lamp Oil	0.50	pint											
Canvas/Linen	0.67	yard			1.800	metres							
Shirting	0.50	yard											
Coarse Woollens	0.33	yard			1.125	metres				1.225	metres		
Sub-total				20.00%				40.01	25.81%			25.52	20.04%
TOTAL				100.00%				155.02	100.00%			127.33	100.00%

Table 5. Prices, Nominal and Real Wages in England and Brabant, 1451-55 to 1696-1700

Mean of 1451-75 = 100

Years	England	England	England		Brabant	Brabant	Brabant
	Prices	Wages	Real		Prices	Wages	Real
	Index	Index	Wages		Index	Index	Wages
1451-55	100.25	100.00	100.06		98.5447	100.00	101.82
1456-60	97.06	100.00	103.12		114.5774	100.00	87.74
1461-65	102.73	100.00	99.01		91.0702	100.00	110.15
1466-70	106.74	100.00	93.72		96.9534	100.00	103.52
1471-75	97.76	100.00	102.59		98.8543	100.00	101.31
1476-80	90.06	100.00	111.68		120.6929	100.00	67.50
1481-85	127.38	100.00	80.74		155.7517	107.50	62.20
1486-90	102.77	100.00	98.06		174.0982	101.67	88.73
1491-95	106.80	100.00	93.93		133.2164	102.08	81.55
1496-00	96.70	100.00	103.51		115.3515	102.08	89.19
1501-05	106.79	100.00	93.75		125.4494	112.08	81.30
1506-10	103.77	100.00	96.39		114.8011	125.00	83.37
1511-15	108.52	100.00	92.53		137.9040	126.67	71.55
1516-20	120.44	100.00	83.66		150.2641	128.75	72.31
1521-25	146.05	100.00	69.13		179.9384	125.42	72.96
1526-30	157.34	100.00	64.27		178.5192	143.33	77.48
1531-35	155.64	100.00	65.01		173.9949	159.17	76.74
1536-40	152.33	108.33	71.39		185.6411	185.83	94.17
1541-45	176.54	115.00	65.36		208.3398	197.50	76.05
1546-50	229.64	120.00	52.82		199.4203	218.75	74.55
1551-55	275.45	140.00	50.89		260.5150	356.67	114.93
1556-60	315.85	160.00	53.34		300.7173	297.08	93.59
1561-65	289.31	166.67	57.74		313.9375	290.83	69.10
1566-70	292.29	166.67	57.03		318.2897	442.50	92.27
1571-75	296.09	170.00	58.09		423.4316	542.50	95.63
1576-80	336.50	190.00	56.62		480.7160	495.00	68.78
1581-85	337.52	200.00	59.29		617.4244	510.00	76.41
1586-90	387.17	200.00	52.53		799.7540	560.00	74.84
1591-95	416.01	200.00	49.05		688.3332	600.00	98.76
1596-00	540.54	200.00	37.81		752.9459	600.00	99.09
1601-05	461.26	200.00	43.73		612.3239	600.00	95.66
1606-10	497.00	200.00	40.47		615.8934	600.00	96.45
1611-15	532.84	200.00	37.74		636.1322	600.00	74.90
1616-20	520.39	200.00	38.55		626.9632	600.00	65.83
1621-25	529.72	200.00	37.99		815.7524	600.00	66.10
1626-30	525.06	203.33	38.94		919.6470	600.00	62.03
1631-35	608.38	226.67	37.43		908.5342	600.00	60.98
1636-40	615.12	248.33	40.68		967.6679	600.00	59.78
1641-45	560.50	268.33	47.92		987.1669	600.00	68.30
1646-50	734.39	283.33	39.32		1015.1382	600.00	71.58

Years	England	England	England		Brabant	Brabant	Brabant
	Prices	Wages	Real		Prices	Wages	Real
	Index	Index	Wages		Index	Index	Wages
1651-55	601.33	296.67	49.98		904.3282	600.00	69.45
1656-60	640.26	300.00	47.16		843.4656	600.00	81.36
1661-65	672.97	300.00	44.82		880.6145		
1666-70	599.64	300.00	50.18		738.1088		
1671-75	615.65	300.00	49.03		828.7059		
1676-80	611.62	300.00	49.17		785.9576		
1681-85	595.14	300.00	50.54		736.5519		
1686-90	547.58	303.33	55.52		652.2165		
1691-95	604.84	315.00	52.88		896.1570		
1696-00	719.99	326.67	45.54		967.9947		

N.B. The arithmetic means that compose the real wage index in this table are the means of the five years in each quinquenniums, which are calculated individually by dividing each year's nominal wage index by the composite price index for that year; they are not calculated by dividing the quinquennials mean of the nominal wage index by the quinquennials means of the price index. The latter method will produce slight differences (as the difference between arithmetic and geometric means).

Table 6.

Money Supply, Prices, and GDP in Canada, 1986 - 1995
1986 = 100

Year	M1 in billions of dollars	V [Income Velocity of Money: M1]	P Consumer Price Index 1986 = 100	y (real): in billions of dollars of 1986 values	Y = nominal GDP in current prices: in billions of current dollars
1986	31.46	16.13	100.0	507.30	507.30
1990	39.41	17.17	118.5	571.10	676.75
1991	40.99	16.68	125.0	546.91	683.64
1992	44.32	15.57	128.4	537.48	690.12
1993	48.32	14.75	130.5	546.25	712.86
1994	54.17	13.79	131.4	568.69	747.26
1995	57.14	13.59	134.0	579.33	776.30

Sources: Statistics Canada, *CANSIM* (GDP figures are income based).

Table 8.**Mayhew's Estimates of Money Supplies, Velocity, Prices, and National Income
in England, 1300 - 1670**

Date	1300	1470	1526	1546	1561	1600	1643	1670
Money Supply in millions of £ sterling	0.900	0.900	1.400	1.450	1.450	3.500	10.000	12.000
Velocity (Income V)	5.178	3.889	3.571	5.517	9.310	6.286	3.500	3.407
Price Level: PBH Index	104.8	104.6	135.1	172.3	289.3	478.3	597.8	635.7
National Income Y in millions £ st.	4.660	3.500	5.000	8.000	13.500	22.000	35.000	40.880
Population in millions	6.000	2.300	2.300	2.900	3.000	4.100	5.100	5.000

Source: Nicholas J. Mayhew, 'Population, Money Supply, and the Velocity of Circulation in England, 1300-1700,' *Economic History Review*, 2nd ser. 48:2 (May 1995), p. 244.

Table 9:**Investment in a Blast Smelter During Inflation**

Hypothetical Example, with 5% annual inflation (compounded)

Loan Contract: £1,000 principal to be repaid in full in ten years, with annual interest payments of 10% (£100) paid each year for ten years.

YEAR	INTEREST	VALUE OF OUTPUT
1	£100	£500.00
2	£100	£525.00
3	£100	£551.25
4	£100	£578.81
5	£100	£607.75
6	£100	£638.14
7	£100	£670.05
8	£100	£703.55
9	£100	£738.73
10	£100	£775.66

Table 10. Imports into Seville of Spanish American Gold and Silver Bullion in pesos of 450 maravedis and in kilograms of fine metals: in quinquennial means, 1501-05 to 1656-61

Year: Begin	Year: End	Public Bullion: Means in pesos of 450 maravedis	Private Bullion: Means in pesos of 450 maravedis	TOTAL Bullion: Means in pesos of 450 maravedis	Mean Silver Imports in kg	Mean Gold Imports in kg
1503	1505	32,405.50	91,279.60	123,685.10		517.24
1506	1510	42,770.80	120,476.50	163,247.30		682.69
1511	1515	62,647.00	176,463.70	239,110.70		999.95
1516	1520	52,043.50	146,595.80	198,639.30		830.70
1521	1525	7,030.50	19,803.50	26,834.00	3.40	111.88
1526	1530	54,414.10	153,273.30	207,687.40	26.34	865.93
1531	1535	86,472.10	243,574.10	330,046.20	5,090.79	854.41
1536	1540	270,177.00	517,401.40	787,578.40	12,147.99	2,038.86
1541	1545	151,557.70	839,243.30	990,801.00	16,815.87	2,363.40
1546	1550	318,534.30	783,207.90	1,101,742.20	18,698.76	2,628.03
1551	1555	725,701.30	1,247,404.90	1,973,106.20	33,479.21	4,707.31
1556	1560	313,699.10	1,286,100.60	1,599,799.70	27,145.03	3,816.70
1561	1565	363,906.60	1,877,600.50	2,241,507.10	83,373.92	1,019.64
1566	1570	756,948.60	2,071,294.50	2,828,243.10	105,197.84	1,286.54
1571	1575	659,732.10	1,721,589.70	2,381,321.80	91,353.22	770.06
1576	1580	1,329,935.70	2,120,452.50	3,450,388.20	132,365.17	1,115.77
1581	1585	1,510,120.80	4,364,801.60	5,874,922.40	232,207.57	1,336.21
1586	1590	1,608,642.50	3,157,883.60	4,766,526.10	188,397.97	1,084.12
1591	1595	2,004,669.70	5,032,302.80	7,036,972.50	273,704.54	1,966.28
1596	1600	2,194,863.60	4,690,836.50	6,885,700.10	267,820.77	1,924.01
1601	1605	1,303,977.10	3,576,688.50	4,880,665.60	193,590.35	1,028.81
1606	1610	1,709,935.80	4,571,105.60	6,281,041.40	249,135.90	1,324.00
1611	1615	1,442,584.30	3,463,039.80	4,905,624.10	196,820.45	795.09
1616	1620	869,557.60	5,152,934.40	6,022,492.00	241,630.75	976.10

Table 10. Imports into Seville of Spanish American Gold and Silver Bullion in pesos of 450 maravedis and in kilograms of fine metals: in quinquennial means, 1501-05 to 1656-61

Year: Begin	Year: End	Public Bullion: Means in pesos of 450 maravedis	Private Bullion: Means in pesos of 450 maravedis	TOTAL Bullion: Means in pesos of 450 maravedis	Mean Silver Imports in kg	Mean Gold Imports in kg
1621	1625	978,231.20	4,423,904.50	5,402,135.70	223,022.55	404.37
1626	1630	923,760.20	4,067,145.10	4,990,905.30	206,045.26	373.59
1631	1635	946,764.90	2,475,405.90	3,422,170.80	143,003.28	126.99
1636	1640	938,260.60	2,324,659.80	3,262,920.40	136,348.64	121.09
1641	1645	928,732.40	1,824,028.10	2,752,760.50	113,889.78	167.03
1646	1650	333,022.50	2,021,086.90	2,354,109.40	97,396.41	142.84
1651	1655	447,775.60	1,010,977.80	1,458,753.40	60,685.98	64.27
1656	1660	121,304.80	550,918.30	672,223.10	27,965.33	29.62

Source:

Earl J. Hamilton, *American Treasure and the Price Revolution in Spain, 1501-1650* (Cambridge, Mass. 1934), pp. 34, 42.

Bullion imports were given only in decennial means; but the values of imported treasure, for gold and silver bullion combined were given in quinquennial means; and for each decade, the proportional values for the quinquennium was used to estimated the quinquennial means of the kilograms of fine metal imported. Hamilton's research in the Seville archives concluded in 1660; and no further research has revealed estimates of treasure imports into Seville beyond 1660. But see the following note concerning the related research of Michel Morineau.

Michel Morineau, however, has provided the following decennial mean estimates of imports of Spanish American silver into Europe, converted into kilograms of fine silver: and these estimates should be treated with suspicion, since they are taken from Dutch newspaper reports, of questionable value

1661-70 10,140,000 in kilograms fine silver

1671-80 13,760,000

1681-90 10,260,000

1691-1700 13,400,000

Michel Morineau, 'D'Amsterdam à Seville: de quelle réalité l'histoire des prix est-elle le miroir?', *Annales: Economies, sociétés, civilisations*, 23 (1968), 196; Michel Morineau, *Incroyables gazettes et fabuleux métaux: les retours des trésors américains d'après les gazettes hollandaises (XVIe - XVIIIe siècles)*, Studies in Modern Capitalism (Paris: Editions de la Maison des Sciences de l'Homme; and Cambridge and New York: Cambridge University Press, 1985).

Table 11.

**Mined Outputs of Gold and Silver from Spanish America; and
Exports of Gold and Silver Bullion from Spanish America to Seville
in quinquennial means, 1501-1505 to 1656-61**

Year	Potosi: Silver Outputs in kg.	Zacatecas: Silver Outputs in kg.	Sombrerete Silver Outputs in kg.	Total Known Silver Mining Outputs in kg	Mean Value of Bullion Imports in 450 maravedis	Mean Gold Imports in kg	Mean Silver Imports in kg	Index of Mined Imports: Outputs 1591- 1591- 1600=100 1600=100
1501-05					123,685.10	517.24	0.00	0.00
1506-10					163,247.30	682.69	0.00	0.00
1511-15					239,110.70	999.95	0.00	0.00
1516-20					198,639.30	830.70	0.00	0.00
1521-25					26,834.00	111.88	3.40	0.00
1526-30					207,687.40	865.93	26.34	0.01
1531-35					330,046.20	854.41	5,090.79	1.88
1536-40					787,578.40	2,038.86	12,147.99	4.49
1541-45					990,801.00	2,363.40	16,815.87	6.21
1546-50					1,101,742.20	2,628.03	18,698.76	6.91
1551-55	64,848.88			64,848.88	1,973,106.20	4,707.31	33,479.21	12.36 31.39
1556-60	54,335.74	21,294.68		75,630.42	1,599,799.70	3,816.70	27,145.03	10.03 36.61
1561-65	56,080.38	27,761.40		83,841.77	2,241,507.10	1,019.64	83,373.92	30.79 40.59
1566-70	51,717.86	31,498.08		83,215.94	2,828,243.10	1,286.54	105,197.84	38.85 40.29
1571-75	36,439.01	35,925.21		72,364.22	2,381,321.80	770.06	91,353.22	33.74 35.03
1576-80	111,607.53	30,389.38		141,996.90	3,450,388.20	1,115.77	132,365.17	48.89 68.74
1581-85	168,398.46	27,613.05		196,011.51	5,874,922.40	1,336.21	232,207.57	85.76 94.89
1586-90	176,839.51	28,413.40		205,252.91	4,766,526.10	1,084.12	188,397.97	69.58 99.36
1591-95	192,454.49	27,002.87		219,457.36	7,036,972.50	1,966.28	273,704.54	101.09 106.24
1596-00	169,671.92	24,005.40		193,677.32	6,885,700.10	1,924.01	267,820.77	98.91 93.76
1601-05	183,470.02	29,736.38		213,206.40	4,880,665.60	1,028.81	193,590.35	71.50 103.21
1606-10	158,273.46	34,121.27		192,394.73	6,281,041.40	1,324.00	249,135.90	92.01 93.14
1611-15	161,108.67	47,517.24		208,625.91	4,905,624.10	795.09	196,820.45	72.69 101.00
1616-20	139,403.78	48,213.16		187,616.94	6,022,492.00	976.10	241,630.75	89.24 90.83
1621-25	134,795.30	55,609.74		190,405.04	5,402,135.70	404.37	223,022.55	82.37 92.18

Table 11.

**Mined Outputs of Gold and Silver from Spanish America; and
Exports of Gold and Silver Bullion from Spanish America to Seville
in quinquennial means, 1501-1505 to 1656-61**

Year	Potosi: Silver Outputs in kg.	Zacatecas: Silver Outputs in kg.	Sombrerete Silver Outputs in kg.	Total Known Silver Mining Outputs in kg	Mean Value of Bullion Imports in 450 maravedis	Mean Gold Imports in kg	Mean Silver Imports in kg	Index of Mined Imports: Outputs 1591- 1591- 1600=100 1600=100
1626-30	130,628.28	47,861.74		178,490.02	4,990,905.30	373.59	206,045.26	76.10 86.41
1631-35	124,267.78	47,934.53		172,202.31	3,422,170.80	126.99	143,003.28	52.82 83.36
1636-40	147,647.32	31,044.38		178,691.70	3,262,920.40	121.09	136,348.64	50.36 86.51
1641-45	113,646.36	28,101.07		141,747.43	2,752,760.50	167.03	113,889.78	42.06 68.62
1646-50	121,192.60	30,215.72		151,408.32	2,354,109.40	142.84	97,396.41	35.97 73.30
1651-55	99,371.13	31,046.27		130,417.40	1,458,753.40	64.27	60,685.98	22.41 63.14
1656-60	103,710.82	26,373.41		130,084.23	672,223.10	29.62	27,965.33	10.33 62.97
1661-65	78,949.36	22,584.61		101,533.96				49.15
1666-70	83,016.31	35,513.85		118,530.16				57.38
1671-75	82,017.54	50,404.29		132,421.83				64.11
1676-80	75,757.15	64,139.87		139,897.01				67.72
1681-85	88,180.87	37,823.48	30,492.83	156,497.18				75.76
1686-90	81,005.43	31,164.00	31,043.50	143,212.93				69.33
1691-95	68,181.86	31,863.18	17,500.54	117,545.58				56.90
1696-00	56,884.78	26,451.05	12,506.02	95,841.85				46.40
1701-05	43,642.72	31,719.17	6,233.96	81,595.85				39.50

Sources:

Peter J. Bakewell, 'Registered Silver Production in the Potosi District, 1550-1735,' *Jahrbuch Für Geschichte: von Staat, Wirtschaft and Gesellschaft Lateinsamerikas*, 12 (1975), 68-103; Peter Bakewell, *Silver Mining and Society in Colonial Mexico: Zacatecas, 1546 - 1700* (Cambridge and New York: Cambridge University Press, 1971), pp. 241-50; Earl J. Hamilton, *American Treasure and the Price Revolution in Spain, 1501-1650* (Cambridge, Mass. 1934), pp. 34, 42.

Outputs of the Mexican and Peruvian Silver Mines in kilograms of fine metal

in quinquennial means, 1700-04 to 1820-24

Five Year Period	Guanajuato kg.	Guanajuato Percent	Zacatecas kg.	Zacatecas Percent	Mexico Total in kg	Peru Total in kg
1700-04			30,868.84	23.8	129,878.24	45,825.45
1705-09			35,661.87	24.2	147,383.35	44,210.42
1710-14			42,783.58	15.2	169,501.11	18,007.17
1715-19			56,687.56	31.2	181,945.21	36,257.76
1720-24			59,005.12	26.2	224,973.39	29,034.58
1725-29			50,438.74	18.0	224,297.68	37,018.15
1730-34			54,007.65	22.3	242,535.00	37,470.63
1735-39			45,976.52	15.3	240,807.15	34,318.63
1740-44			33,593.91	8.3	241,748.34	n.d.
1745-49			42,315.94	13.8	305,861.20	n.d.
1750-54			38,882.49	11.6	334,495.98	n.d.
1755-59			33,414.43	9.9	336,850.98	n.d.
1760-64			24,677.19	8.3	295,936.59	n.d.
1765-69	64,704	16.9	25,933.31	8.5	306,703.45	n.d.
1770-74	86,559	21.5	37,845.56	9.4	403,223.54	55,310.40
1775-79	120,570	25.1	67,168.07	14.0	479,925.27	61,745.23
1780-84	114,624	22.1	59,279.44	11.4	518,775.99	72,843.75
1785-89	112,045	22.3	54,682.45	11.4	481,873.20	79,582.12
1790-94	137,927	24.6	56,010.04	10.0	561,349.47	109,161.65
1795-99	131,020	21.9	64,987.11	10.5	619,495.09	126,354.53
1800-04	129,076	24.1	62,426.54	9.3	536,062.82	120,477.36
1805-09	143,329	23.3	113,273.93	18.5	614,067.87	106,318.22
1810-14	80,304	34.2	74,662.35	19.1	234,752.33	84,424.56
1815-19	47,458	19.7	61,609.02	25.6	240,828.26	61,405.96
1820-24	19,791		57,385.73		0.00	36,564.80

Table 13.

**Disposition of Public Revenues from the Viceroyalty of Peru and Mexico in
equivalent kilograms of fine silver, in decennial means, 1581-90 to 1791-1800**

Decade	Peru:				Mexico:		TOTAL to Castile from Peru/Mexico in kg. silver Decennial Mean	Mexico to Phillipines in kg. fine silver: Decen. Means	Percent of Mexican Total to Phillipines	Mexico: Total Remittances in kg silver Decennial Mean
	Total Revenues in Lima Treasury in kg. Decennial Means	Peru: Share Retained	Peru: Remitt- ances to Castile in equiv. kgs of fine silver Decennial Means	Peru: Percent of Total to Castile	Remittances to Castile in equiv. kgs. of fine silver Decennial Means	Mexico: Percent of Total to Castile				
1581-90					23,107.5			3,219.8	12.2%	26,327.3
1591-00	86,097.9	40.7%	51,013.3	68.1%	23,856.3	31.9%	74,869.6	1,191.2	4.8%	25,047.5
1601-10	97,147.4	54.6%	44,091.2	61.7%	27,379.3	38.3%	71,470.5	3,003.0	9.9%	30,382.3
1611-20	88,604.9	66.2%	29,936.2	65.7%	15,604.2	34.3%	45,540.4	6,496.7	29.4%	22,100.9
1621-30	85,168.7	65.3%	29,531.5	63.6%	16,887.3	36.4%	46,418.8	9,254.5	35.4%	26,141.8
1631-40	96,329.6	53.6%	44,692.7	66.7%	22,321.1	33.3%	67,013.8	9,388.2	29.6%	31,709.3
1641-50	112,884.8	66.1%	38,230.2	83.4%	7,620.8	16.6%	45,851.0	5,640.8	42.5%	13,261.6
1651-60	81,994.4	73.2%	21,970.6	66.6%	11,035.0	33.4%	33,005.6	3,855.6	25.9%	14,890.6
1661-70	78,358.0	88.4%	9,121.4	47.2%	10,202.0	52.8%	19,323.4	3,526.2	25.7%	13,728.2
1671-80	69,653.4	92.3%	5,340.0	17.3%	25,477.0	82.7%	30,817.0	4,162.5	14.0%	29,639.5
1681-90	69,439.6	98.9%	785.7	6.1%	12,195.1	93.9%	12,980.8	4,990.0	29.0%	17,185.1
1691-00	50,117.4	95.7%	2,152.5	24.6%	6,595.8	75.4%	8,748.3	4,246.7	39.2%	10,842.5
1701-10	44,318.4	90.4%	4,238.1	24.0%	13,395.1	76.0%	17,633.2	3,192.2	19.2%	16,587.3
1711-20	24,447.0	99.2%	197.8	1.1%	18,370.0	98.9%	18,567.8	2,583.9	12.3%	20,953.9
1721-30	35,947.2	92.6%	2,647.3	14.5%	15,589.1	85.5%	18,236.4	4,829.5	23.7%	20,418.6
1731-40	30,898.0	88.5%	3,540.9	14.4%	21,114.2	85.6%	24,655.1	3,748.2	15.1%	24,862.4
1741-50	32,229.6	95.8%	1,352.2	7.8%	15,968.0	92.2%	17,320.2	4,370.5	21.5%	20,338.5
1751-60					40,000.7			5,227.2	11.6%	45,227.9
1761-70					18,564.1			4,834.2	20.7%	23,398.3
1771-80					38,572.9			7,087.4	15.5%	45,660.3
1781-90					72,305.0			5,472.8	7.0%	77,777.8
1791-00					96,606.2			11,967.4	11.0%	108,573.6

Table 13.

**Disposition of Public Revenues from the Viceroyalty of Peru and Mexico in
equivalent kilograms of fine silver, in decennial means, 1581-90 to 1791-1800**

Decade	Peru:				Mexico:			Percent of Mexican Total to Phillipines	Mexico: Total Remittances in kg silver Decennial Mean
	Total Revenues in Lima Treasury in kg. Decennial Means	Peru: Share Retained	Peru: Remitt- ances to Castile in equiv. kgs of fine silver Decennial Means	Peru: Percent of Total to Castile	Remittances to Castile in equiv. kgs. of fine silver Decennial Means	Mexico: Percent of Total to Castile	TOTAL to Castile from Peru/Mexico in kg. silver Decennial Mean		

Sources:

John J. TePaske, 'New World Silver, Castile and the Phillipines, 1590-1800,' in John F. Richards, ed., *Precious Metals in the Later Medieval and Early Modern Worlds* (Durham: Carolina Academic Press, 1983), pp. 442-4.

Table 14.

**The Role of Spanish Silver in English Silver Mint Outputs:
From the Tower Mint's 'Melting Books', in Troy Pounds Weight.**

Period Covered Tower Mint's Melting Books	Spanish Silver Coins: in Troy lb.*	Percent of Total Bullion	Total Silver Bullion in Troy lb.*
Oct. 1561 to Dec. 1562	60,993.8	75.0 %	81,325.00
June to Dec. 1567		7.4%	
Sept. 1569 to Feb. 1570	21,321.1	81.4 %	26,193.00
Feb. 1583 to Nov. 1583	40,469.2	78.1 %	51,817.20
June 1584 to Feb. 1585	40,905.8	86.3%	47,394.00
Feb. 1598 to Jan. 1599	6,726.4	62.0%	10,849.00

* 1 Troy pound = 12 Troy ounces = 373.242 grams.

Table 15.

The London Tower Mint under the Tudors

**Average Annual Outputs of Silver and of Total Gold and Silver Coinage
in Pounds Sterling Values for Various Periods, 1485 to 1603**

Period of the Annual Mean	Silver Coin in £ st.	Total Coinage in £ st.	Silver as % of Total
1485 - 1525	9,633.0	40,657.1	23.7 %
1526^a- 1543	33,521.2	53,534.7	62.6 %
1544^b- 1550*	389,211.3	576,952.4	67.5 %
1551^c- 1560	22,850.0	31,670.1	72.2 %
1561^d-1603	106,840.2	124,735.6	85.7 %

^a Minor debasement of Nov. 1526.

^b Henry VIII's drastic debasements, 1544-49.

^c 1551: Coinage revaluation.

^d 1561: Recoinage.

SOURCES: for Tables 4 and 5:

Christopher Challis, *The Tudor Coinage* (Manchester 1978); and his article 'Spanish Bullion and Monetary Inflation in England in the Later Sixteenth Century,' *Journal of European Economic History*, 4 (1975), 381-92.

Table 16

The Mint Outputs of England and the Low Countries, in 25-Year Totals, 1300-24 to 1575-99: in Kilograms of Pure Silver and Gold, and in Aggregate Money-of-Account Values (Pounds Sterling and Livres Gros Flemish)

Years	<u>ENGLAND</u>		<u>LOW COUNTRIES</u> *			
	Silver kg.	Gold kg.	Current £ sterling	Silver kg.	Gold kg.	Current £ gros F1.
1300-24	403,029	nil	1,260,746			
1325-49	37,602	3,951	291,054			
1350-74	121,629	43,379	2,335,905	155,772	46,449	1,725,341
1375-99	7,462	9,594	442,228	79,172	11,940	843,621
1400-24	18,932	27,312	1,387,601	96,180	529	451,471
1425-49	87,707	6,926	738,082	103,899	17,675	1,652,668
1450-74	68,352	11,557	1,096,728	54,444	6,964	759,957
1475-99	33,655	6,767	632,349	153,645	4,624	1,750,654
				<u>Bruges and Antwerp**</u>		
1475-99				134,650	4,432	1,542,807
1500-24	59,090	18,979	1,569,081	47,789	13,768	1,728,074
1525-49	247,248	21,993	4,666,444	70,280	8,664	1,401,535
1550-74	305,288	5,356	3,580,657	280,958	12,260	4,078,004
1575-99	287,644	4,348	2,924,852	144,398	1,263	2,222,801

*** Mint output data for the Low Countries:**

- (a) Flanders only, 1350-1419;
- (b) Flanders, Brabant, Namur, Hainaut, and Holland-Zeeland, 1420-1499;
- (c) Bruges and Antwerp only, 1500-1599.

No Flemish mint data are available before 1334; and for such 25-year totals, the Flemish data commence therefore in 1350. Brabantine mint data are available from the 1370s, but are not included here until 1420, from which time Brabant becomes fully part of the Flemish monetary orbit, so that values of Brabantine mint outputs can be accurately recorded in terms of Flemish pounds (£) gros. Similarly the mints of Holland-Zeeland, Namur, and Hainaut became part of the Flemish-Burgundian monetary system only from the 1420s (when their mint records first become available).

** For 1475-99, Ghent and Mechelen mint outputs are also included in the totals for Bruges and Antwerp. From 1500, we currently have processed continuous mint data only for Antwerp and Bruges - which were certainly the two leading mints of the southern Low Countries.

Table 17

Twenty-Five Year Means of the Values of Aggregate Coinage Outputs and of the Composite Price Indices in England and the Low Countries, 1300-24 to 1575-99

Years	ENGLAND			LOW COUNTRIES ^a			BRABANT	
	Mint Outputs in £ sterling	Price Indices 1450-74=100	s.d.*	Mint Outputs in £ gros Flemish	Price Indices 1450-74=100	s.d.*	Price Indices	s.d.
1300-24	50,430	121.5	33.85					
1325-49	11,642 ⁺	102.0	15.66					
1350-74	93,436	135.6	17.40	69,014	89.8	22.99		
1375-99	17,689	108.0	12.37	33,745	108.3	18.00		
1400-24	55,504 ⁺	108.1	11.47	18,059	99.4	12.68	74.3	10.10
1425-49	29,523	106.2	17.05	66,107	122.3	23.49	107.1	15.10
1450-74	43,869 ⁺	100.0	7.58	30,398	100.0	11.76	100.0	10.24
1475-99	25,294	103.2	18.27	70,026	143.5	46.05	139.8	34.16
				<u>Antwerp and Bruges*</u>				
1475-99			61,712	143.5	46.05	139.8	34.16	
1500-24	62,763	114.0	18.97	69,123			140.0	26.46
1525-49	186,658 ⁺	166.5	29.18	56,061			187.8	22.24
1550-74	143,226 ⁺	285.8	40.76	163,120			316.7	65.53
1575-99	116,994	391.2	94.90	88,912			655.6	208.10

^a **Low Countries:** Flanders only 1350-1420; Low Countries: Flanders, Brabant, Namur, Hainaut, Holland-Zeeland, 1420-1499;

^b **Antwerp and Bruges:** with Mechelen and Ghent, 1475-99; Antwerp and Bruges alone, 1500-99.

* standard deviations from the mean.

⁺ Periods with extensive debasements and/or recoinages in England.

Table 18

**The Value of the Mint Outputs of England:
Silver and Gold Coinages in**

Current Pounds Sterling: Decennial Means, 1400-9 to 1590-9

Years	Silver in £ sterling	% of Total	Gold in £ sterling	% of Total	Total Coin in £ sterling
1400-9	181.35	2.8%	6,291.41	97.2%	6,472.76
1410-9	4,028.78	5.7%	66,865.30	94.3%	70,894.08
1420-9	19,167.70	20.0%	76,701.38	80.0%	95,869.08
1430-9	24,843.99	72.2%	9,557.86	27.8%	34,401.85
1440-9	1,161.53	23.6%	3,769.01	76.4%	4,930.54
1450-9	6,304.82	71.0%	2,574.57	29.0%	8,879.39
1460-9	23,105.63	31.2%	51,016.95	68.8%	74,122.58
1470-9	11,038.11	25.0%	33,160.84	75.0%	44,198.95
1480-9	5,366.46	28.6%	13,365.41	71.4%	18,731.87
1490-9	10,526.86	39.0%	16,448.04	61.0%	26,974.89
1500-9	24,684.13	28.9%	60,817.80	71.1%	85,501.93
1510-9	3,695.98	6.9%	49,770.56	93.1%	53,466.54
1520-9	33,467.35	43.2%	43,965.86	56.8%	77,433.21
1530-9	35,432.64	63.3%	20,527.83	36.7%	55,960.47
1540-9	217,915.60	62.1%	133,274.76	37.9%	351,190.36
1550-9	118,001.32	84.2%	22,110.36	15.8%	140,111.68
1560-9	146,408.96	85.9%	23,977.05	14.1%	170,386.01
1570-9	72,651.99	89.7%	8,304.89	10.3%	80,956.88

1580-9	101,997.72	80.0%	25,445.45	20.0%	127,443.17
1590-9	117,475.77	89.2%	14,177.67	10.8%	131,653.44

Table 19.

OUTPUTS OF SILVER FROM CENTRAL EUROPEAN MINES:								
in kilograms of pure silver								
Five Year Means: 1470-4 to 1545-9								
Years	Saxony: Schneeberg Annaberg Marienberg kg	Thuringia: Eisleben Hettstedt kg	Tirol Schwaz kg	Bohemia Kutna Hora Kaperska H. kg	Bohemia Joachimstahl kg	Slovakia Thurzo-Fugger Company est. kg.	Hungary: Nagybanya Körmöcbanya	TOTALS Estimated.
1470-4	3,743.3		4,112.5	4,500.0				12,355.8
1475-9	8,633.0		7,354.0	4,250.0				20,237.0
1480-4	5,764.7		9,745.8	4,000.0			1,800.0	21,310.5
1485-9	2,601.6		12,751.0	3,750.0			3,523.0	22,625.6
1490-4	3,233.6		12,422.8	3,500.0			3,523.0	22,679.4
1495-9	4,641.7		12,094.5	3,250.0			3,795.9	23,782.1
1500-4	8,099.6		11,766.3	3,000.0			4,068.7	26,934.6
1505-9	7,725.2	4,509.0	11,438.0	2,750.0		3,929.5	4,341.6	34,693.3
1510-4	7,589.5	5,441.8	11,109.8	2,500.0		3,936.9	4,614.4	35,192.4
1515-9	5,170.4	5,905.7	10,781.5	2,250.0	2,172.2	2,090.2	4,887.3	33,257.3
1520-4	3,860.3	6,010.0	10,453.3	2,000.0	9,627.8	2,486.5	5,160.1	39,598.0
1525-9	3,359.6	7,821.8	10,125.0	2,000.0	13,223.2	2,312.6	5,433.0	44,275.2
1530-4	4,922.4	6,673.9	10,125.0	2,000.0	16,275.4	2,269.1	5,433.0	47,698.8
1535-9	14,336.8	5,709.5	10,125.0	3,947.0	13,217.9	2,256.5	5,433.0	55,025.7
1540-4	9,330.2	4,381.9		3,997.0	11,537.2	2,154.2	5,433.0	36,833.5
1545-9	6,071.1	6,957.3		700.0	11,537.2	2,154.2	5,433.0	32,852.8

Table 20

Silver Outputs from Various Central European Mines:

Annual Outputs in Kilograms for Years of Extant Data

Place	Year	Annual Output in kg.
<u>GERMANY</u>		
Lower Harz Mountains	1510	935
Rammelsberg	1526	2,105
Freiberg	1490	177
	1511-20	933
	1526-30	2,100
	1572	7,860
<u>AUSTRIA</u>		
Tirol: Falkenstein	1486	14,812
Tirol: other (than Schwaz)	1505	8,851
	1523	15,710
	1530	10,013
Rattenberg	1528	1,503
Carinthia	1528	283
	1550	411
Salzburg	1520	2,250
<u>HUNGARY</u>		

Körmöcbanya	1434-35	660
	1486-92	3,523
	1528-49	5,433
Nagybanya	1481-82	1,800

BOHEMIA

Kutna Hora (Kuttenberg)	1300-1330	±30,000
	1330-1350	±20,000
	1350-1420	±10,000
	1420-1460	?
	1460-1510	4,500
	1521-1530	2,000
	1531-1540	600
	1541-1550	700
Kasperska Hora		
(Bergreichenstein)	1536-43	3,297
Krumau	1520-21	121
Pribam	1536-38	347
Elischau-Wilhartitz	1536-38	1,127

Table 21

**Estimates of Aggregate Silver Production from Central
European Mines in the Sixteenth Century
Annual Estimates in Kilograms of Fine Silver**

Years	Germany	Austria- Hungary	TOTAL

<u>According to Soetbeer (1879):</u>			
1493 - 1520	11,000 kg.	24,000 kg.	35,000 kg.
1521 - 1544	15,000 kg.	32,000 kg.	47,000 kg.
1545 - 1560	19,400 kg.	30,000 kg.	49,400 kg.
1561 - 1580	15,000 kg.	23,500 kg.	38,500 kg.
 <u>According to Nef (1941)</u>			
1526-1535	35,100 kg.	49,100 kg.	84,200 kg. (minimum)
		56,100 kg.	91,200 kg. (maximum)

Table 22

**Exports of Gold and Silver 'Treasure' and Merchandise
to India By the British East India Company
in Pounds Sterling**

Decennial Averages, 1660-9 to 1710-9

Decade	Silver	%	Gold	%	Total Value
1660-69	51,446.7	69.5%	22,575.7	30.5%	74,022.4
1670-79	102,038.1	43.6%	132,053.3	56.4%	234,091.4
1680-89	262,870.4	68.5%	120,837.3	31.5%	383,707.7
1690-99	163,230.2	98.0%	3,331.2	2.0%	166,561.4
1700-09	325,887.6	96.7%	11,121.3	3.3%	337,008.9
1710-19	369,340.3	99.4%	2,077.8	0.6%	371,418.10

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Table 23

**Exports of 'Treasure' and Merchandise to India
By the British East India Company, in Pounds Sterling,
Decennial Means, 1660-69 to 1710-19**

Decade	Treasure	%	Merchandise	%	Total in £
1660-69	74,022.4	64.3%	41,085.2	35.7%	115,107.6
1670-79	234,091.4	72.2%	89,990.8	27.8%	324,082.2
1680-89	383,707.7	87.2%	56,170.2	12.8%	439,877.9
1690-99	166,561.4	69.8%	72,065.2	30.2%	238,626.6
1700-09	337,008.9	84.7%	60,876.5	15.3%	397,885.4
1710-19	371,418.1	79.2%	97,771.3	20.8%	469,189.4

Table 24

**Exports of Gold and Silver to India by the British East India Company: Decennial Means
in Kilograms of Pure Metal and Pounds Sterling Values, 1660-69 to 1710-19**

<u>Decade</u>	<u>Total £ Treasure</u>	<u>SILVER kg.</u>	<u>% by Value £</u>	<u>GOLD kg.</u>	<u>% by Value in £</u>
1660-69	74,022.4	5,729.6	69.5%	175.14	30.5%
1670-79	234,091.4	11,364.0	43.6%	1,015.30	56.4%
1680-89	383,707.7	29,276.0	68.5%	929.07	31.5%
1690-99	166,561.4	18,179.0	98.0%	24.69	2.0%
1700-09	337,008.9	36,294.3	96.7%	79.54	3.3%
1710-19	371,418.1	41,133.6	99.4%	14.97	0.6%

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Table 25

**Exports of Silver to India and East Asia
by the Dutch and British East India Companies,
in kilograms of pure metal
Decennial Means, 1660-9 to 1710-19**

<u>Decade</u>	<u>By the Dutch East India Co.</u>	<u>By the British East India Co.</u>	<u>Total Silver Shipments</u>
1660-69	11,563.1	5,729.6	17,292.70
1670-79	11,854.6	11,364.0	23,218.60
1680-89	18,847.0	29,276.0	48,123.00
1690-99	27,720.9	18,179.0	45,899.90
1700-09	37,392.9	36,294.3	73,687.20
1710-19	37,108.1	41,133.6	78,241.70

Table 26.

NEW WORLD GOLD PRODUCTION: ESTIMATES									
Decade	Caribbean	Mexico	Peru	New Granada	Ecuador	Chile	Brazil	Total Decadal	Total Annual Mean
1492-1500	1,086							1,086	108.60
1501-1510	12,098							12,098	1,209.80
1511-1520	10,711							10,711	1,071.10
1521-1530	3,409	2,358						5,767	576.70
1531-1540	2,249	3,769	8,541	2,264	257			17,080	1,708.00
1541-1550	1,315	1,256	4,827	2,089	868	3,102		13,457	1,345.70
1551-1560	53	124	3,533	5,593	2,549	4,653		16,505	1,650.50
1561-1570		124	1,183	7,604	3,226	1,590		13,727	1,372.70
1571-1580		78	1,104	7,977	6,143	4,873		20,175	2,017.50
1581-1590		82	1,002	6,728	6,442	1,551		15,805	1,580.50
1591-1600		1,483	161	12,541	3,486	776		18,447	1,844.70
1601-1610		3,535	80	13,934	2,076	155		19,780	1,978.00
1611-1620		4,010	1	11,153	927	71		16,162	1,616.20
1621-1630		4,428		8,951	1,985	23		15,387	1,538.70
1631-1640		3,924		3,548	635	19		8,126	812.60
1641-1650		2,427		7,885	131			10,443	1,044.30
1651-1660		2,687	2	7,540	202			10,431	1,043.10
1661-1670		2,943	70	4,105	233			7,351	735.10
Decade	Caribbean	Mexico	Peru	New	Ecuador	Chile	Brazil	Total	Total

NEW WORLD GOLD PRODUCTION: ESTIMATES

	Granada						Decadal	Annual Mean
1671-1680	2,372	80	4,406	194			7,052	
1681-1690	2,186	267	6,437	194			9,084	908.40
1691-1700	2,740	550	4,950	339	60		8,639	863.90
1701-1710	2,373	620	5,140	291	15	47,597	56,036	5,603.60
1711-1720	2,665	404	7,499	339	188	46,563	57,658	5,765.80
1721-1730	2,715	332	8,570	144	254	103,315	115,330	11,533.00
1731-1740	5,177	286	10,210	96	426	137,930	154,125	15,412.50
1741-1750	7,937	257	14,793	48	709	145,430	169,174	16,917.40
1751-1760	7,972	191	17,759	2,012	1,108	111,680	140,722	14,072.20
1761-1770	10,586	1,299	20,501	1,676	6,673	107,930	148,665	14,866.50
1771-1780	13,078	5,844	22,681	1,789	9,134	107,930	160,456	16,045.60
1781-1790	9,169	11,758	27,869	4,049	9,243	96,680	158,768	15,876.80
1791-1800	15,711	15,725	33,130	4,846	9,137	77,473	156,022	15,602.20
1801-1810	23,733	11,747	34,535	914	11,560		82,489	8,248.90

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